Oracle® Communications

EAGLE Database Administration - SS7 User's Guide

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Oracle Communications EAGLE Database Administration - SS7 User's Guide, Release 47.0

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  - Significant reduction in system capacity or traffic handling capability
  - Loss of the system's ability to perform automatic system reconfiguration
  - Inability to restart a processor or the system
  - Corruption of system databases that requires service affecting corrective actions
  - Loss of access for maintenance or recovery operations
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Acronyms

The following table provides information about the acronyms and the terminology used in the document:

Table Acronyms

Acronym	Description
AGW	Application Gateway
ANSI	American National Standards Institute
APC	Adjacent Point Code
ATGW	Access Transfer Gateway
ATM	Asynchronous Transfer Mode
CCSS	Common Channel Signaling System
CDMA	Code Division Multiple Access
CPA	Calling Party Address
CIC	Circuit Identification Code
CLLI	Common Language Location Identifier
CR	Cluster Routing
CRMD	Cluster Routing and Management Diversity
CPC	Capability Point Code
CPCS	Common Part Convergence Sublayer
DPC	Destination Point Code
ELEI	Exception List Exclusion Indicator
FLOBR	Flexible Linkset Optional Based Routing
FPCR	Full Point Code Routing
FTP	File Transfer Protocol
GTI	Global Tittle Indicator
GPL	Generic Program Loads
GSW	Gateway Screening
IETF	Internet Engineering Task Force
IMF	Integrated Message Feeder
IP	Intelligent Peripheral or Internet Protocol
ISUP	ISDN User Part
ITU	International Telecommunications Union
LIM	Link Interface Module
MA	Mated Application
MASP	Maintenance and Administration Subsystem Processor
MCAP	Maintenance Communication Application Processor
MDA	Maintenance Disk and Alarm card
MGC	Media Gateway Controller
MRN	Maintenance Relay Node
MSA	Main Signalling Area
MSC	Mobile Switching Center
MSU	Message Signal Unit

Table (Cont.) Acronyms

Acronym	Description
MTP	Message Transfer Part
NGN	Next Generation Network
OPC	Origination Point Code
PDS	Persistent Device States
PIC	Performance Intelligence Center
PSTN	Public Switched Telephone Network
QOS	Quality of Service
RST	Route Set Test
RTT	Round Trip Time
SAAL	Signaling ATM Adaptation Layer
SAPC	Secondary Adjacent Point Code
SCP	Service Control Point
SCCP	Signaling Connection Control Part
SCTP	Stream Control Transmission Protocol
SEP	Signaling End Point
SGW	Signaling Gateway
SI	Service Indicator
SIF	Signaling Information Field
SIO	Service Information Octet
SLIC	Service and Link Interface Card
SLS	Signaling Link Selection
SMSC	Short Message Service Center
SSA	Sub Signaling Area
SPCF	Service Specific Convergence Function
SPCOP	Service Specific Connection Oriented Protocol
SSCS	Service Specific Convergence Sublayer
SSP	Service Switching Point
STP	Signal Transfer Point
TCP/IP	Transmission Control Protocol/Internet Protocol
TFP	Transfer Prohibited
TPC	True Point Code
TU	Transaction Unit
TUS	Transaction Units per Second
UAM	Unsolicited Alarm Messages
UIM	Unsolicited Information Messages
VCL	Virtual Channel Link
VCC	Virtual Circuit Connection
VPC	Virtual Path Connection

What's New in This Guide

This section introduces the documentation updates for Release 47.0 in Oracle Communications EAGLE Database Administration - SS7 User's Guide.

Release 47.0 -F41398-02, August 2023

Added a note about the list of cards supported by EAGLE release 47.0 in the Overview section.

Release 47.0 -F41398-01, September 2022

There are no updates in this document for Release 47.0.

1
Introduction

Chapter 1, Introduction, contains general information about the database and the organization of this manual.

1.1 Overview

The *Database Administration – SS7 User's Guide* describes the procedures used to configure the EAGLE and its database to implement the **SS7** protocol.

> **Note:**
>
> Database administration privileges are password restricted. Only those persons with access to the command class “Database Administration” can execute the administrative functions. Other command classes and the commands allowed by those classes are listed in *Commands User's Guide*.

> **Note:**
>
> For the complete list of cards supported by EAGLE Release 47.0, see *Hardware Reference* Guide.

As of Release 46.6, throughout this manual, these terms are used to refer to either the EPM-B version or other replacement version of the card unless one of the card types is specifically required.

- E5-ENET - the E5-ENET-B card
- E5-E1T1 - the E5-E1T1-B card
- E5-ATM - the E5-ATM-B card
- E5-IPSM - the E5-ENET-B card that is running the IPSHC GPL
- E5-SM4G - the E5-SM8G-B card (not an EPM-B card)
- MCPM - the original MCPM or the E5-MCPM-B card

1.2 Scope and Audience

This user's guide is intended for database administration personnel or translations personnel responsible for configuring the **EAGLE** and its database to implement the **SS7** protocol.

1.3 References

For more information, refer to the following documents:

1. *Commands User's Guide*
2. *Database Administration - IP7 User's Guide*
3. *Database Administration - GTT User's Guide*
4. *Hardware Reference Guide*
5. *Database Administration - System Management User's Guide*
6. *ELAP Administration and LNP Feature Activation User's Guide*
7. *INP/AINPQ User's Guide*
8. *G-Flex User's Guide*
9. *G-Port User's Guide*
10. *EIR User's Guide*
11. *ATINP User's Guide*
12. *A-Port User's Guide*
13. *V-Flex User's Guide*
14. *Analyzed Information Features User's Guide*
15. *TIF User's Guide*

1.4 Maintenance and Administration Subsystem

The Maintenance and Administration Subsystem (MAS) is the central management point for the EAGLE. The **MAS** provides user interface, maintenance communication, peripheral services, alarm processing, system disk interface, and measurements. Management and redundancy are provided by use of two separate subsystem processors.

The MAS resides on two separate sets of Maintenance and Administration Subsystem Processor (**MASP**) cards and a Maintenance Disk and Alarm card (collectively referred to as **control cards**). The control cards are located in slots 1113 through 1118 of the EAGLE control shelf. The control cards must be E5-based cards.

E5-based Control Cards

The E5-based set of EAGLE control cards consists of the following cards:

- Two Maintenance and Administration Subsystem Processor cards (E5-MASP) cards. Each dual-slot **E5-MASP card** is made up of the following two modules:
  - Maintenance Communication Application Processor (E5-MCAP) card
  - Terminal Disk Module (E5-TDM) card
- One Maintenance Disk and Alarm card (E5-MDAL card)

Maintenance Communication Application Processor (E5-MCAP) Card

The **E5-MCAP card** contains the Communications Processor and Applications Processor and provides connections to the IMT bus. The card controls the maintenance and database administration activity and performs both application and communication processing. E5-MCAP cards are located in slots 1113 and 1115 of the control shelf.

Each E5-MCAP card contains two **USB port**s. One **latched USB port** is used with removable flash media ("thumb drives"), and one **flush-mounted USB port** is used with a plug-in flash drive. The **removable media** drive in the latched USB port is used to install and back up customer data. The flush-mounted USB port is used for upgrade and could be used for disaster recovery.

Terminal Disk Module (E5-TDM) Card

The **E5-TDM card** provides the Terminal Processor for the 16 I/O ports, and interfaces to the Maintenance Disk and Alarm (E5-MDAL) card and fixed disk storage. The E5-TDM card also distributes Composite Clocks and High Speed Master clocks throughout the EAGLE, and distributes Shelf ID to the EAGLE. Each E5-TDM card contains one fixed SATA drive that is used to store primary and backup system databases, measurements, and Generic Program Loads (GPLs). E5-TDM cards are located in slots 1114 and 1116 of the control shelf.

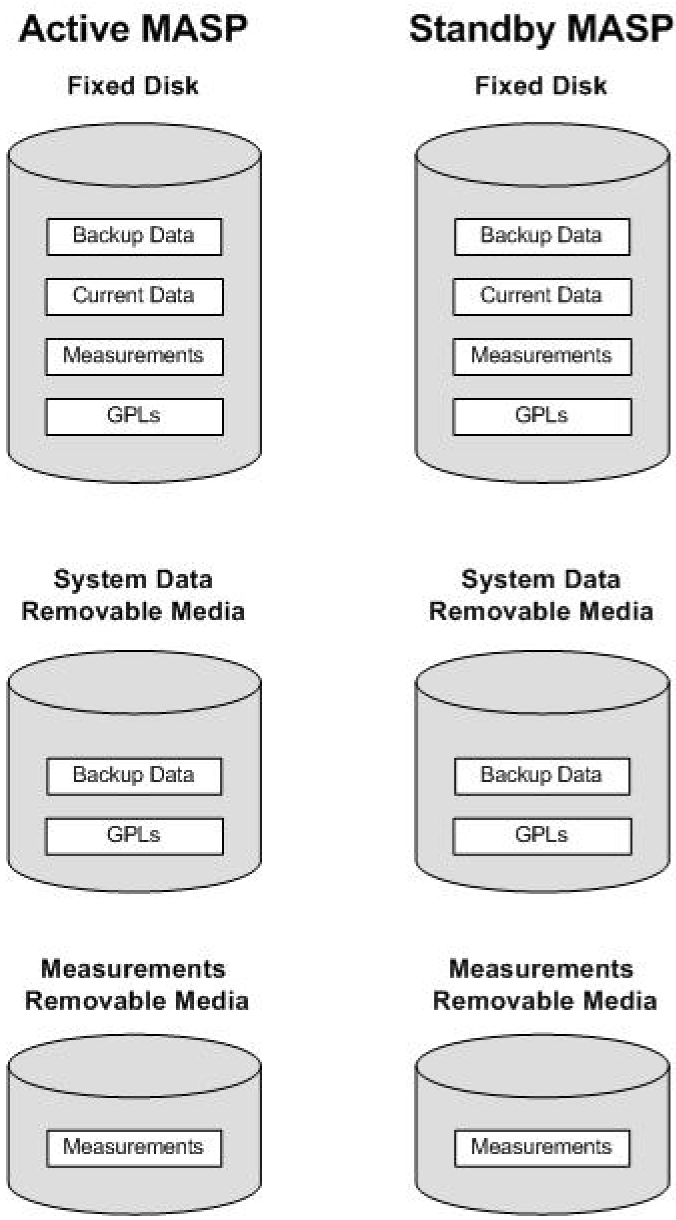
Maintenance Disk and Alarm (E5-MDAL) Card

The **E5-MDAL card** processes alarm requests and provides fan control. There is only one E5-MDAL card in a control card set. Critical, major, and minor system alarms are provided for up to 6 individual frames. In addition to the 3 system alarms, the E5-MDAL card provides the system audible alarm. The E5-MDAL card provides control of fans on a per-frame basis, and allows for each fan relay to be set individually. The E5-MDAL card is located in slots 1117 and 1118 of the control shelf.

1.5 EAGLE Database Partitions

The data that the **EAGLE** uses to perform its functions are stored in two separate areas: the fixed disk drives, and the removable media. The following sections describe these areas and data that is stored on them. These areas and their partitions are shown in Figure 1-1.

Figure 1-1 EAGLE Database Partitions (E5-Based Control Cards)



Fixed Disk Drive

There are two fixed disk drives on the **EAGLE**. The fixed disk drives contain the "master" set of data and programs for the **EAGLE**. The two fixed disk drives are located on the terminal disk modules (**E5-TDM**s). Both disks have the same files. The data stored on the fixed disks is partially replicated on the various cards in the **EAGLE**. Changes made during database administration sessions are sent to the appropriate cards.

The data on the fixed disks can be viewed as four partitions.

- Current partition
- Backup partition

- Measurements partition
- Generic program loads (**GPL**s) partition

The data which can be administered by users is stored in two partitions on the fixed disk, a current database partition which has the tables which are changed by on-line administration, and a backup database partition which is a user-controlled copy of the current partition.

All of the on-line data administration commands affect the data in the current partition. The purpose of the backup partition is to provide the users with a means of rapidly restoring the database to a known good state if there has been a problem while changing the current partition.

A full set of **GPL**s is stored on the fixed disk, in the **GPL** partition. There is an approved **GPL** and a trial **GPL** for each type of **GPL** in this set and a utility **GPL**, which has only an approved version. Copies of these **GPL**s are downloaded to the **EAGLE** cards. The **GPL** provides each card with its functionality. For example, the `ss7ansi` **GPL** provides **MTP** functionality for link interface modules (**LIM**s).

Measurement tables are organized as a single partition on the fixed disk. These tables are used as holding areas for the measurement counts.

Removable Media

The removable media is used with the E5-MCAP card portion of the E5-MASP in card locations 1113 and 1115.

The removable media is used for two purposes.

- To hold an off-line backup copy of the administered data and system **GPL**s
- To hold a copy of the measurement tables

Because of the size of the data stored on the fixed disk drives on the **E5-TDMs**, a single removable media cannot store all of the data in the database, **GPL** and measurements partitions.

To use a removable media to hold the system data, it must be formatted for system data. To use a removable media to hold measurements data, it must be formatted for measurements data. The **EAGLE** provides the user the ability to format a removable media for either of these purposes. A removable media can be formatted on the **EAGLE** by using the `format-disk` command. More information on the `format-disk` command can be found in *Commands User's Guide*. More information on the removable media drives can be found in *Hardware Guide*.

Additional and preformatted removable media are available from the My Oracle Support (MOS).

2
Configuring Destination Tables

Chapter 2, Configuring Destination Tables, describes the methods for configuring destination point codes (DPCs) in the database of the EAGLE. The cluster routing and management diversity feature is also discussed in this section.

2.1 Introduction

The **SS7** network configuration for the **EAGLE** requires linksets and routes. These entities use point codes, and these point codes must be defined in the destination point code table of the database. A destination is a node in any network that is uniquely identified by a point code in conjunction with a network indicator. The destination is always the node's true point code.

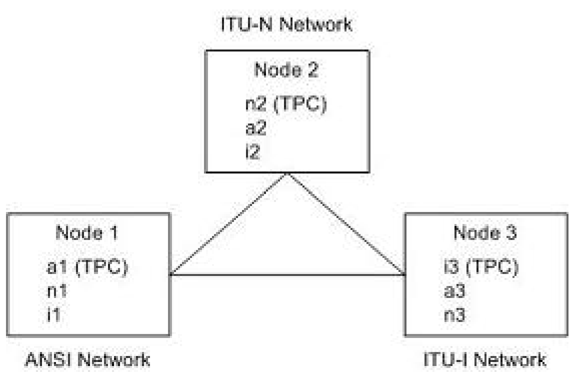
The **EAGLE** supports three types of networks and nodes to carry **SS7** traffic, using **TCP/IP** technology:

- **ANSI**
- **ITU** International (**ITU**-I)
- **ITU** National (**ITU**-N)

When nodes in different networks wish to communicate, each node must have its own true point code and an alternate point code for each of the network types involved. For example, if node 1 in an **ANSI** network, node 2 in an **ITU**-N network, and node 3 in an **ITU**-I network wish to communicate with each other, node 1 must have an **ANSI** true point code and one alternate point code each for the **ITU**-N and **ITU**-I network. Node 2 must have an **ITU**-N true point code and one alternate point code each for the **ANSI** and **ITU**-I network. Node 3 must have an **ITU**-I true point code and one alternate point code each for the **ANSI** and **ITU**-N network.

Figure 2-1 shows an example of a mixed network with **ANSI**, **ITU**-I, and **ITU**-N nodes. Each node has one true point code and two alternate point codes.

Figure 2-1   Mixed Network with ANSI, ITU-I, and ITU-N Nodes



The node's true point code is also called the destination point code.

This chapter discusses the method for configuring destination point codes (**DPCs**) in the database of the **EAGLE**. **Destination** point codes can be one of five types:

- Full point codes used for **SS7** routing. A full point code is a point code containing numbers in each portion of the point code, for example, 111-011-100. The full point code can be in one of three formats, **ANSI**, **ITU** international, or **ITU** national. See the Point Code Formats section for more information on the point code formats. The **EAGLE** must have a full point code for each network type (**ANSI**, **ITU**-N, **ITU**-I) it is connected to.
- Secondary point codes, used by the **Multiple Point Code** Support feature. A secondary point code is a point code assigned to a full point code and used as if they were the actual **EAGLE** point code. Secondary point codes can be in one of three formats: **ANSI**, **ITU** international, or **ITU** national. The format of the secondary point code must be the same as the format of the full destination point code. See the Multiple Point Code Support section for more information on secondary point codes.
- Cluster destination point codes, used by the cluster routing and management (**CRMD**) feature and nested cluster routing feature. A cluster point code is an **ANSI** point code containing numbers in the network identifier and network cluster portions of the point code, and an asterisk (*) in the network cluster member field of the point code, for example, 111-011-*. See the Cluster Routing and Management Diversity (CRMD) section and the Nested Cluster Routing section for more information on cluster point codes.
- Network routing point codes, used by the network routing feature. A network routing point code is an **ANSI** point code containing a number in the network identifier portion of the point code, and asterisks (*) in the network cluster and network cluster member portions of the point code, for example, 111-*-*. See the Network Routing section for information on network routing point codes.
- Proxy point codes, used by the Proxy Point Code feature. A proxy point code is a point code that assumes the point code of another node in order to ease the migration of deploying an STP in a network with direct-connect links into other networks. See the Proxy Point Codes section for more information about proxy point codes.

The **Cluster** Routing and Management Diversity (**CRMD**) feature, the nested cluster routing feature, the multiple point code support feature, and the network routing features are also discussed in this section.

In order to complete the definition of linksets and routes, destination point codes are required to be in the database. Even though linksets use adjacent point codes, the adjacent point code of a linkset must be defined in the destination point code table of the database.

The procedures shown in this chapter use a variety of commands. If more information on these commands is needed, go to *Commands User's Guide* to find the required information.

2.2 Point Code Formats

The **EAGLE** supports three different point code formats:

- **ANSI** point codes

- **ITU** International point codes
- **ITU** National point codes (both 14-bit **ITU**-N point codes and 24-bit **ITU**-N point codes).

ANSI Point Codes

ANSI point codes are made up of three groups of digits called the network indicator (**NI**), network cluster (**NC**), and network cluster member (**NCM**). The values for **ANSI** point codes depends on the value of the `pctype` parameter of the `chg-sid` command, either `ansi` or `other`. If the `pctype` parameter is set to `ansi`, the **ANSI** rules for the **ANSI** point code are used to define the point code. The range of values for an **ANSI** point code with the `pctype=ansi` parameter are:

- **NI** – 001-255
- **NC** – 001-255 (if ni = 001-005) or 000-255, * (if ni = 006-255)
- **NCM** – 000-255, *

The `pctype=other` parameter specifies that the **ANSI** point codes do not meet **ANSI** standards. The range of values for **ANSI** point codes with the `pctype=other` parameter are:

- **NI** – 000-255
- **NC** – 000-255, *
- **NCM** – 000-255, *

The asterisk (*) point code value indicates a single cluster address for a cluster point code (for example, `20-2-*`) or a network routing destination (`21-*-*`). for more information on cluster point codes, see the Cluster Routing and Management Diversity (CRMD) section. For more information on network routing point codes, see the Network Routing section.

A double asterisk (**) and triple asterisk (***) can also be used for the **NC** and **NCM** fields of the **ANSI** point code, but for only the `rtrv-dstn`, `rept-stat-dstn`, `rtrv-rte`, and `rept-stat-rte` commands.

A double asterisk in the **NCM** field of a point code (for example, 20-2-**) produces a summary report that shows all point code destinations or routes residing in the given cluster (20-2). This does not include the cluster point code, if the cluster point code (for example, 20-2-*) is provisioned. The following examples (`rtrv-dstn` and `rtrv-rte`) are reports generated using two asterisks in the **NCM** field of a point code.

```
rtrv-dstn:dpca=20-2-**


rlghncxa03w 09-05-28 21:16:37 GMT EAGLE5 41.0.0
    DPCA           CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
    020-002-045    rlghncbb100 no  --- ----------      --------------    SS7
    020-002-050    rlghncbb100 no  --- ----------      --------------    SS7

Destination table is (11 of 2000) 1% full
Alias table is (5 of 8000) 1% full


rtrv-rte:dpca=20-2-**


rlghncxa03w 07-05-28 21:16:37 GMT EAGLE5 37.0.0
   DPCA           ALIASI     ALIASN/N24    LSN        RC     APCA
```

```
   020-002-045 ---------- --------------    lsn1       15    020-002-045
                                            lsn2       20    020-003-036
                                            lsn3       25    001-001-002
                                                RTX:No  CLLI=-----------
   020-002-050 ---------- --------------    lsn4       15    020-002-050
                                            lsn3       20    001-001-002
                                            lsn2       25    020-003-036
                                                RTX:No  CLLI=-----------
```

A double asterisk in the **NC** field of a network routing point code (for example, 21-**-*) produces a summary report that shows all point code destinations or routes that are members of the given network (network 21). This does not include the specified network routing point code (for example, 21-*-*). The following examples (`rtrv-dstn` and `rtrv-rte`) are reports using two asterisks in the **NC** field of a network routing point code.

```
rtrv-dstn:dpca=21-**-*
```

```
rlghncxa03w 09-05-28 21:16:37 GMT EAGLE5 41.0.0
    DPCA           CLLI        BEI ELEI   ALIASI           ALIASN/N24
DMN
    021-002-045   rlghncbb101 no  --- ----------      --------------
SS7
    021-002-050   rlghncbb101 no  --- ----------      --------------
SS7

Destination table is (11 of 2000) 1% full
Alias table is (5 of 8000) 1% full
```

```
rtrv-rte:dpca=21-**-*
```

```
rlghncxa03w 07-05-28 21:16:37 GMT EAGLE5 37.0.0
   DPCA           ALIASI     ALIASN/N24     LSN        RC    APCA
   021-002-045 ---------- --------------    lsn10      15    021-002-045
                                            lsn20      20    021-003-036
                                            lsn30      25    010-001-002
                                                RTX:No  CLLI=-----------
   021-002-050 ---------- --------------    lsn40      15    021-002-050
                                            lsn30      20    010-001-002
                                            lsn20      25    021-003-036
                                                RTX:No  CLLI=-----------
   021-005-*   ---------- --------------    lsn40      15    021-002-050
                                            lsn30      20    010-001-002
                                            lsn20      25    021-003-036
                                                RTX:No  CLLI=-----------
```

Three asterisks in the **NCM** field of a point code produces a summary report that shows all point code destinations or routes residing in the given network cluster along with the specified cluster point code, if the cluster point code (for example, 20-2-*) is provisioned. The following examples (`rtrv-dstn` and `rtrv-rte`) are reports using three asterisks in the **NCM** field of a point code.

```
rtrv-dstn:dpca=20-2-***


rlghncxa03w 09-05-17 16:00:32 GMT  EAGLE5 41.0.0
    DPCA          CLLI        BEI ELEI   ALIASI         ALIASN/N24    DMN
    020-002-*     rlghncbb000 no  --- ----------      --------------   SS7
    020-002-045   rlghncbb100 no  --- ----------      --------------   SS7
    020-002-050   rlghncbb100 no  --- ----------      --------------   SS7

Destination table is (11 of 2000) 1% full
Alias table is (5 of 8000) 1% full

rtrv-rte:dpca=20-2-***


rlghncxa03w 07-05-28 21:16:37 GMT EAGLE5 37.0.0

   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   020-002-045 ---------- --------------   lsn1       15    020-002-045
                                           lsn2       20    020-003-036
                                           lsn3       25    001-001-002
                                               RTX:No  CLLI=-----------
   020-002-050 ---------- --------------   lsn4       15    020-002-050
                                           lsn3       20    001-001-002
                                           lsn2       25    020-003-036
                                               RTX:No  CLLI=-----------
   020-002-*   ---------- --------------   lsn4       15    020-002-050
                                           lsn3       20    001-001-002
                                           lsn2       25    020-003-036
                                               RTX:No  CLLI=-----------
```

Three asterisks in the **NC** field of the point code produces a summary report that shows all point code destinations or routes residing in the given network along with the specified network routing point code. The following examples (`rtrv-dstn` and `rtrv-rte`) are reports using three asterisks in the **NC** field of a network routing point code.

```
rtrv-dstn:dpca=21-***-*


rlghncxa03w 09-05-17 16:00:32 GMT  EAGLE5 41.0.0
    DPCA          CLLI        BEI ELEI   ALIASI         ALIASN/N24    DMN
    021-*-*       rlghncbb001 yes yes ----------      --------------   SS7
    021-002-045   rlghncbb101 no  --- ----------      --------------   SS7
    021-002-050   rlghncbb101 no  --- ----------      --------------   SS7

Destination table is (11 of 2000) 1% full
Alias table is (5 of 8000) 1% full


rtrv-rte:dpca=21-***-*


rlghncxa03w 07-05-28 21:16:37 GMT EAGLE5 37.0.0
```

```
DPCA           ALIASI     ALIASN/N24     LSN        RC    APCA
021-002-045 ---------- --------------    lsn10      15    021-002-045
                                         lsn20      20    021-003-036
                                         lsn30      25    010-001-002
                                             RTX:No  CLLI=-----------
021-002-050 ---------- --------------    lsn40      15    021-002-050
                                         lsn30      20    010-001-002
                                         lsn20      25    021-003-036
                                             RTX:No  CLLI=-----------
021-005-*   ---------- --------------    lsn40      15    021-002-050
                                         lsn30      20    010-001-002
                                         lsn20      25    021-003-036
                                             RTX:No  CLLI=-----------
021-*-*     ---------- --------------    lsn30      20    010-001-002
                                         lsn20      25    021-003-036
                                         lsn40      35    021-002-050
                                             RTX:No  CLLI=-----------
```

The following rules apply to provisioning **ANSI** point code if the `pctype=ansi` parameter is specified with the `chg-sid` command:

- The **NI** value of 0 is not allowed (for example, `dpc=0-1-1` and `dpc=0-0-0` are not valid point codes).
- If the **NI** value is 1, 2, 3, 4, or 5, then the nc value cannot be 0 (for example, `dpc=5-0-1` is rejected).
- If the **NI** value is 1, 2, 3, 4, or 5, then network routing point codes are not allowed (for example, `dpc=4-*-*` is rejected).

The following rules apply to provisioning **ANSI** point code if the `pctype=other` parameter is specified with the `chg-sid` command:

- The **NI** value of 0 is allowed, however `dpc=0-0-0` is rejected (for example, `dpc=0-1-1` is accepted).
- The **NC** value can be 0 for all values of **NI** (for example, `dpc=5-0-1` is accepted).
- Network routing point codes are allowed for all values of ni (for example, `dpc=4-*-*` is accepted).

An **ANSI** point code containing all zeros is not a valid point code and cannot be entered into the database.

ITU International Point Codes

The **ITU** international point codes are made up of three groups of digits called zone, area, and id. The range of values for **ITU** International point codes are:

- **ZONE** – 0-7
- **AREA** – 000-255
- **ID** – 0-7

An **ITU** international point code containing all zeros is not a valid point code and cannot be entered into the database.

14-Bit ITU National Point Codes

The 14-bit **ITU** national point code is either a 1- to 5-digit number, or 2, 3, or 4 numbers separated by dashes. 14-bit **ITU** national point codes can also have group codes assigned to them if the **ITU** National Duplicate **Point Code** feature is on. The group code is a two-character field ranging from **AA** to **ZZ** that is entered as the last subfield of a 14-bit **ITU** national point code and is separated by a dash from the rest of the point code. If the **ITU** National Duplicate **Point Code** feature is on, the format of a 14-bit **ITU** national point code is either a 1- to 5-digit number with a group code (for example, 11567-aa), or 2, 3, or 4 numbers separated by dashes with a group code (for example, 5-15-10-3-aa).

For more information on the format of 14-bit **ITU** national point code formats, see the 14-Bit ITU National Point Code Formats section.

For more information on the **ITU** National Duplicate **Point Code** feature and group codes, see the ITU National Duplicate Point Codes section.

24-Bit ITU National Point Codes

A 24-bit **ITU** national point code is made up of three segments separated by dashes. Each segment contains three digits and corresponds to 8 bits of the point code. The range of values for 24-bit **ITU** national point codes are:

- Main Signaling Area (**MSA**) – 000-255
- Sub Signaling Area (**SSA**) – 000-255
- Signaling Point (**SP**) – 000-255

A 24-bit **ITU** international point code containing all zeros is not a valid point code and cannot be entered into the database.

Spare Point Codes

The provisioning of spare point codes allows the **EAGLE** to process messages that contain either the International Spare or National Spare network indicator values. Spare point codes can be provisioned only if the **ITU** National and International **Spare Point Code** (**PC**) Support feature is enabled. Only **ITU**-I and 14-bit **ITU**-N point codes can be provisioned as spare point codes.

Spare point codes are shown with the prefix “s-” with the point code value. This allows the destination point code table to contain two point code entries with the same value, one a spare point code and one a non-spare point code. For example, the destination point code table contains these point code entries, 2-034-5 and s-2-034-5. Point code 2-034-5 is a non-spare **ITU**-I point code and point code s-2-034-5 is a spare **ITU**-I point code.

Private Point Codes

Private point codes are used for internal routing in the **EAGLE** 5 **ISS**. Private point codes can be used for internal point codes for the End Office feature, and for adjacent point codes for **IPGWx** linksets.

Private point codes are shown with the prefix “p-” with the point code value. This allows the destination point code table to contain two point code entries with the same value, one private and one not private. For example, the destination point code table contains these point code entries, 002-002-002 and p-002-002-002. Point code 002-002-002 is a non-private point code that is used for configuring linksets and routes from the **EAGLE** 5 **ISS** to external nodes in the network. Point code p-002-002-002 is a private point code and is not known to the external nodes in the network.

By using private point codes for internal routing, these point code values are not known outside of the **EAGLE** 5 **ISS** and do not use a point code value for network configuration.

There can be private point codes for all point code types: **ANSI**, **ITU**-I, **ITU**-I Spare, 14-bit **ITU**-N, 14-bit **ITU**-N Spare, and 24-bit **ITU**-N.

Point Code Usage

The **ANSI** are used in **ANSI** networks. The **ITU** international point codes are used in **ITU** international networks. The **ITU** national point codes are used in **ITU** national networks. **ITU** national point codes can be either 14-bit **ITU** national point codes, or 24-bit **ITU** national point codes. Table 2-1 shows a sample destination point code for each type of network.

Table 2-1 Point Code Format

Network Type	Point Code Format
ANSI	001-002-003
ITU International	7-255-7
14-bit **ITU** National	See “14-Bit ITU National Point Code Formats”
24-bit **ITU** National	001-002-003

To enter an **ITU** international point code, a 14-bit **ITU** national point code or a 24-bit **ITU** national point code, either as a **DPC** or as an alias point code, the self **ID** of the **EAGLE** must be defined for these networks. Verify this with the `rtrv-sid` command. If point code values are shown in the `PCI` field of the output of the `rtrv-sid` command, then **ITU** international point codes can be entered. If point code values are shown in the `PCN` field of the output of the `rtrv-sid` command, then the 14-bit **ITU** national point codes can be entered. If point code values are shown in the `PCN24` field of the output of the `rtrv-sid` command, then 24-bit **ITU** national point codes can be entered. If a value is shown in the `PCN` field, then a value cannot be entered in the `PCN24` field. If a value is shown in the `PCN24` field, then a value cannot be entered in the `PCN` field.

A destination is defined with a mandatory true point code of one format, and two optional alias point codes that are of the other two formats. Alias point codes are used to provide alternate point codes for a particular destination. The true point code must be of the same format as the point code used for the self **ID** of the **EAGLE** and must match the format of the point code used for the destination node. For example, if the destination node uses an **ANSI** point code, then the true point code must be an **ANSI** point code.

A destination can have up to two alias point codes. A destination alias point code type must not match that destination's true point code type. If both alias point codes are defined, the point code types of the aliases must not match.

The point code type (**ANSI**, **ITU** international, **ITU** national) is specified by different parameters. A letter that indicates the point code type is appended to the parameter that specifies the point codes. The appended letters are as follows.

“A” – indicates an **ANSI** point code, for example, `dpca`

“I” – indicates an **ITU** international point code, for example, `dpci`

“N” – indicates a 14-bit **ITU** national point code, for example, `dpcn`

“N24” – indicates a 24-bit **ITU** national point code, for example, `dpcn24`

The **ANSI** point codes can also be specified by a point code parameter without the letter “A” appended to it, for example, `dpc`.

2.3 14-Bit ITU National Point Code Formats

The format of a 14-bit **ITU** national point code is defined by the `npcfmti` parameter of the `chg-stpopts` command. This parameter defines how the 14-bit **ITU** national point code is entered into the database, and how it is displayed in any **EAGLE** outputs (command outputs or unsolicited outputs).

The 14-bit **ITU** national point code can be either a single number, up to five digits, or two, three, or four numbers separated by dashes. The 14-bit **ITU** national point code is a 14-bit integer. The values used by the `npcfmti` parameter of the `chg-stpopts` command defines the number of bits that make up each part of the point code format, if the 14-bit **ITU** national point code is made up of two, three, or four numbers.

If the 14-bit **ITU** national point code format has less than four numbers, the parts of the point code format not being used must be specified as zero (0). All four parts of the point code format must be specified with the `npcfmti` parameter, no matter how many numbers the point code format will contain, and the sum of the values of all four parts of the point code format must be 14 (for example, `NPCFMTI=7-7-0-0`, `NPCFMTI=0-6-8-0`, `NPCFMTI=0-0-4-10`, `NPCFMTI=3-8-3-0`, `NPCFMTI=14-0-0-0`).

If the database contains 14-bit **ITU** national point codes of a particular format, and the format is changed with the `npcfmti` parameter of the `chg-stpopts` command, the format of the 14-bit **ITU** national point codes in the database will be changed to the new format.

The values of the parts of the 14-bit **ITU** national point code are defined in Table 2-2.

Table 2-2 14-Bit ITU National Point Code Values

NPCFMTI Parameter Values	0	1	2	3	4
Range of Values	The segment is not used.	0–1	0–3	0–7	0–15
NPCFMTI Parameter Values	5	6	7	8	9
Range of Values	0–31	0–63	0–127	0–255	0–511
NPCFMTI Parameter Values	10	11	12	13	14
Range of Values	0–1023	0–2047	0–4095	0–8191	0–16383

A 14-bit **ITU** national point code containing all zeros is a valid point code and can be entered into the database.

When the **EAGLE** is delivered to the user, the format of the 14-bit **ITU** national point code is set to 14-0-0-0 (a single number containing up to five digits). If the 14-bit **ITU** national point code is a single number, the value of the point code is from 1 to 16383.

To change the format of a 14-bit **ITU** national point code, perform Changing the Format of 14-Bit ITU National Point Codes. The example used in this procedure changes the format of the 14-bit ITU national point code from 14-0-0-0 to 4-4-4-2.

Changing the Format of 14-Bit ITU National Point Codes

> **Caution:**
>
> Changing the formats of the 14-bit **ITU** national point codes will change how any existing 14-bit **ITU** national point codes are displayed in the database.

1. Display the existing values for the `npcfmti` parameter by entering the `rtrv-stpopts` command. The value for the `npcfmti` parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
NPCFMTI       14-0-0-0
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

2. Change the value of the `npcfmti` parameter. For this example, enter this command.
`chg-stpopts:npcfmti=4-4-4-2`

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 00:22:57 GMT  EAGLE5 37.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

> **Note:**
>
> The parameters of the `chg-stpopts` command are optional. For any parameters not specified with the `chg-stpopts` command, the values for these parameters are not changed.

3. Verify the changes using the `rtrv-stpopts` command. This is an example of the possible output.

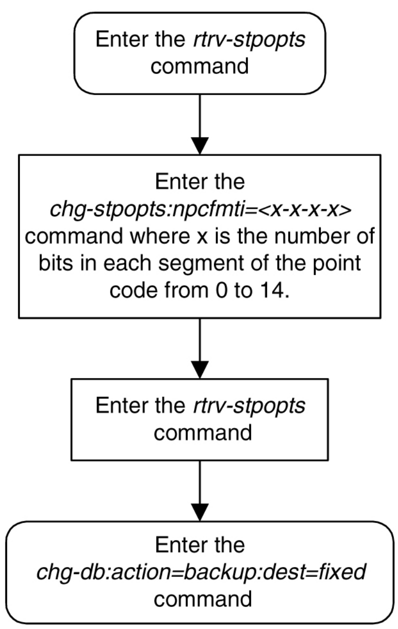
```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

4. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command. These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 2-2 Changing the Format of an ITU National Point Code



Examples of Different 14-Bit ITU National Point Code Formats

A 14-bit **ITU** national point code whose format is 3-8-3-0, results in a point code containing three numbers separated by dashes. Because the fourth part of the format is zero, the point code format contains only three numbers. Using Table 2-2 as a guide, the range of values for this point code format are from 0-000-1 to 7-255-7.

A 14-bit **ITU** national point code whose format is 2-8-3-1, results in a point code containing four numbers separated by dashes. Using Table 2-2 as a guide, the range of values for this point code format are from 0-000-0-1 to 3-255-7-1.

A 14-bit **ITU** national point code whose format is 7-0-7-0 results in a point code containing two numbers separated by dashes. Because the second and fourth parts of the format are zero, the point code format contains only two numbers. Using Table 2-2 as a guide, the range of values for this point code format are from 000-001 to 127-127.

A 14-bit **ITU** national point code whose format is 14-0-0-0 results in a point code containing a single number, containing up to five digits. Using Table 2-2 as a guide, the range of values for this point code format are from 1 to 16383.

Exception

The format defined by the `npcfmti` parameter of the `chg-stpopts` command applies to all database entities that use 14-bit **ITU** national point codes, except gateway screening. Gateway screening allows the 14-bit **ITU** national point code to be displayed and entered in the database only as a single number. If the **EAGLE** 5 **ISS** is using a format for the 14-bit **ITU** national point code other than a single number, the point code will have to be converted from its current format to a single number in order to be used by gateway screening.

Converting Single Number 14-Bit ITU National Point Codes

To convert a single number **ITU** national point code to a multiple part **ITU** national point code, perform these steps. For this example, the 14-bit **ITU** national point codes 14781 and 695 are converted to point codes using the 3-8-3-0 format.

1. The point code is converted to a binary number. This can be done with most scientific calculators.
   - The number 14781 converts to the binary number 11100110111101.
   - The number 695 converts to the binary number 1010110111.

   > **Note:**
   >
   > Make sure the binary number contains 14 digits. If it does not, add leading zeros to the binary number to bring the total number of digits in the number to 14.
   > In this example, the binary equivalent for the decimal number 695 (1010110111) contains 10 digits, so four zeros must be added to the beginning of the binary number. The resulting binary number is now 00001010110111.

2. Divide the binary number into the number of parts required by the format of the 14-bit **ITU** national point code. For this example, the format is 3-8-3-0. Since the last part of the point code format is 0, the point code format contains only three parts. Divide the point code into three parts: the first part of the point code contains the first three digits of the 14-digit binary number, the second part of the point code contains the next eight digits of the 14-digit binary number, and the third part of the point code contains the last three digits of the 14-digit binary number.

For this example, the binary numbers would be divided like this:

- 11100110111101 = 111 00110111 101
- 00001010110111 = 000 01010110 111

3. Convert each part of the point code into a decimal number, using the same scientific calculator used in step 1, and separate each part of the point code with dashes. The results are as follows.
   - 111 00110111 101 = 7-55-5
   - 000 01010110 111 = 0-86-7

When the 14-bit **ITU** national point codes are converted from single numbers to multiple-part point codes, the resulting value of the multiple-part point code depends on the point code format specified by the `npcfmti` parameter of the `chg-stpopts` command. When converting the single-number point code 14781 to the point code format 3-8-3-0, the resulting point code value is 7-55-5. If point code 14781 is converted to the point code format 4-4-4-2, the resulting point code value is 14-6-15-1.

Converting Multiple-Part 14-Bit ITU National Point Codes

To convert multiple-part 14-bit **ITU** national point codes to a single number, perform these steps. For this example, the 14-bit **ITU** national point codes 7-55-5 and 0-86-7, using the 3-8-3-0 point code format, are converted into a single number.

1. Convert each part of the point code into a binary number using a scientific calculator. The results are as follows.
   - 7-55-5 = 111 00110111 101
   - 0-86-7 = 000 01010110 111
2. Combine each part of the point code into a single binary number as follows.
   - 111 00110111 101 = 11100110111101
   - 000 01010110 111 = 00001010110111

> **Note:**
>
> If the binary number has any zeros at the beginning of the number, remove these zeros, as they are not necessary.
> In this example, the binary equivalent for the point code 0-86-7 (00001010110111) contains four zeros at the beginning of the binary number. When the leading zeros are removed from the binary number, the resulting binary number is now 1010110111.

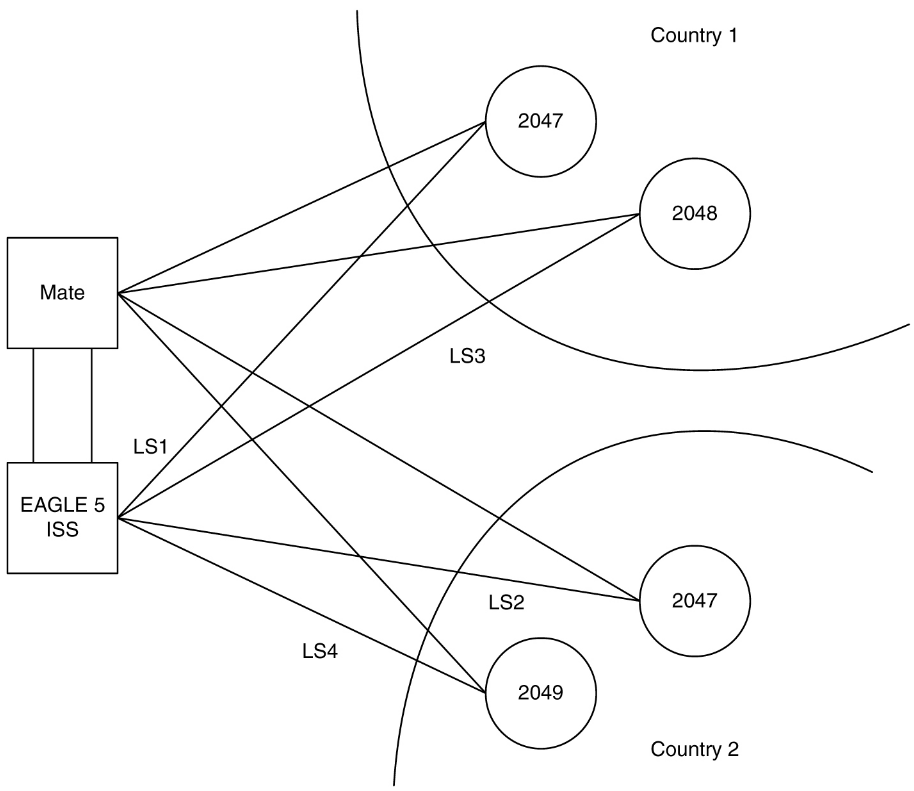
3. Convert the binary number to a decimal number using the same scientific calculator used in step 1.
   - The binary number 11100110111101 converts to the decimal number 14781.
   - The binary number 1010110111 converts to the decimal number 695.

2.4 ITU National Duplicate Point Codes

> **Note:**
>
> This feature applies only to 14-bit **ITU** national spare and non-spare point codes.

This feature allows an **EAGLE** mated pair to route traffic for two or more countries that may have overlapping point code values. For example, in the network shown in Figure 2-3, both Country 1 and Country 2 have **SSPs** with a **PC** value of 2047.

Figure 2-3 Network Example #1



Group Codes

Users must divide their **ITU**-National destinations into groups. These groups will likely be based on Country. However, one group could have multiple countries within it, or a single country could be divided into multiple groups. The requirements for these groups are:

- No duplicate point codes are allowed within a group.
- **ITU**-National traffic from a group must be destined for a **PC** within the same group.

- The user must assign a unique two-letter group code to each group.

For example, in the network shown in Figure 2-4, Country 1 can only have 1 point code with a value of 2047. Traffic coming from **SSP** 2047 in Country 1 can only be destined to other nodes within Country 1. In this example, the user assigns a group code of 1 to Country 1, and a group code of 2 to Country 2.

When the user enters an **ITU**-National point code, they must also enter the group code, using the format “point code - group code”. This group code must be used for any command that uses an **ITU**-N point code.

For example, to provision the **EAGLE** for the network shown in Figure 2-4, the user would enter these commands:

```
ent-dstn:dpcn=2047-aa
```

```
ent-dstn:dpcn=2048-aa
```

```
ent-dstn:dpcn=2047-ab
```

```
ent-dstn:dpcn=2049-ab
```

```
ent-ls:lsn=LS1:apcn=2047-aa
```

```
ent-ls:lsn=LS2:apcn=2047-ab
```

```
ent-ls:lsn=LS3:apcn=2048-aa
```

```
ent-ls:lsn=LS4:apcn=2049-ab
```

Group Code aa

The following special rules apply to group code aa:

- **ITU**-N **MSUs** received on an **ITU**-I linkset are assigned group code of aa.
- **ITU**-N destinations entered before this feature is turned on are assigned group code of aa when the **ITUDUPPC** feature bit is turned on.

Normal Operation

When an **ITU**-N message arrives at the **EAGLE**, the **EAGLE** creates an internal point code based on the 14 bit **PC** in the message, and the group code assigned to the incoming linkset.

For example, when a message arrives on **LS3** with **DPC** of 2047, the **EAGLE** maps that to an internal point code of 2047-aa, because **LS3** has a group code of aa. The **EAGLE** then routes the message to **LS1**, which is the route for 2047-aa.

When a message arrives on **LS4** with **DPC** of 2047, the **EAGLE** maps that to an internal point code of 2047-ab, because **LS4** uses group code ab. The **EAGLE** then routes the message to **LS2**, which is the route for 2047-ab.

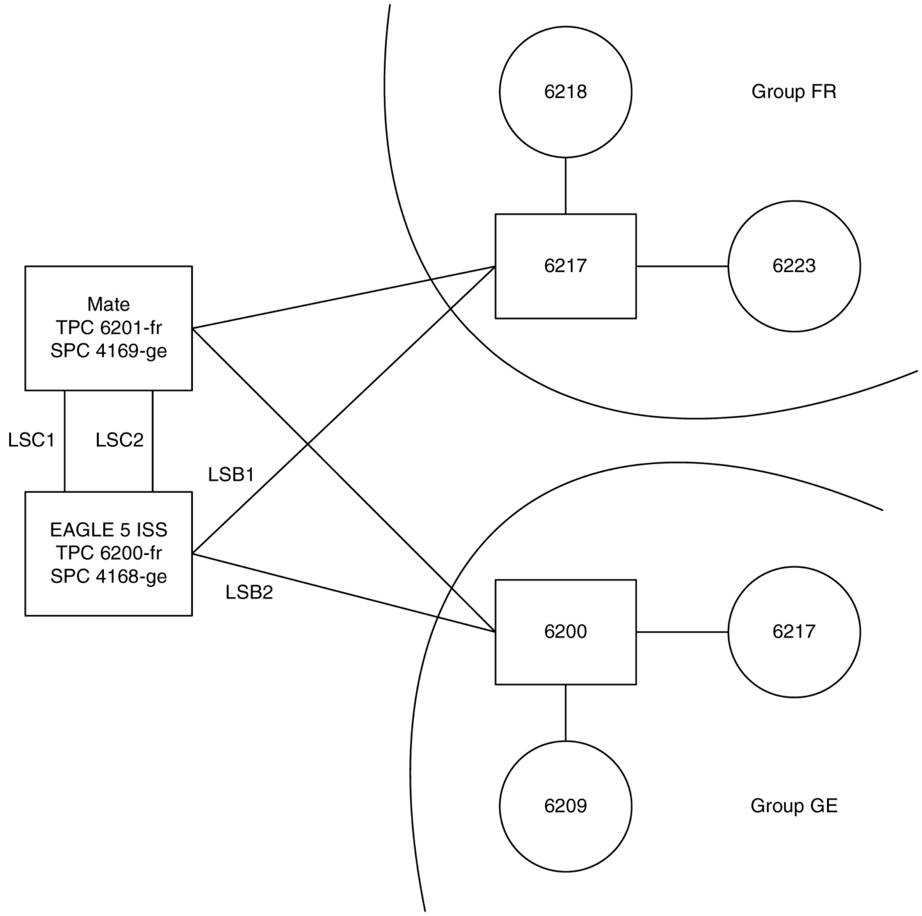
C Linksets

For each group defined, a separate C-linkset must be defined. This C-linkset is used as the alternate route for point codes in the group.

For example, in Figure 2-4, LSC1 is used for point codes in Group fr. Its adjacent point code is 6201-fr, and is used as the alternate route for 6217-fr, 6218-fr, and 6223-fr.

LSC2 is used for point codes in Group ge. Its adjacent point code is group 4169-ge, and is used as the alternate route for 6200-ge, 6209-ge, and 6217-ge.

Figure 2-4 Network Example #2



For example, to provision the **EAGLE** for the network shown in Figure 2-5, the user would enter these commands:

`ent-dstn:dpcn=6201-fr` (Mate's true **PC**)

`ent-dstn:dpcn=4169-ge` (Mate's secondary **PC**)

`ent-dstn:dpcn=6217-fr` (Group fr destinations)

`ent-dstn:dpcn=6218-fr`

`ent-dstn:dpcn=6223-fr`

`ent-dstn:dpcn=6200-ge` (Group ge destinations)

`ent-dstn:dpcn=6217-ge`

`ent-dstn:dpcn=6209-ge`

`ent-ls:lsn=LSC1:apcn=6201-fr:lst=C` (C linkset used by Group fr)

`ent-ls:lsn=LSC2:apcn=4169-ge:lst=C` (C linkset used by Group ge)

`ent-ls:lsn=LSB1:apcn=6217-fr:lst=B`

`ent-ls:lsn=LSB2:apcn=6200-ge:lst=B`

`ent-rte:dpcn=6217-fr:lsn=LSB1:rc=10` (primary route for a Group fr destination)

`ent-rte:dpcn=6217-fr:lsn=LSC1:rc=20` (alternate route for a Group fr destination)

`ent-rte:dpcn=6217-ge:lsn=LSB2:rc=10` (primary route for a Group ge destination)

`ent-rte:dpcn=6217-ge:lsn=LSC2:rc=20` (alternate route for a Group ge destination)

Receiving an ITU-National MSU on an ITU-International Linkset

It is possible for the **EAGLE** to receive **ITU**-National **MSUs** on an **ITU**-International linkset. A linkset is considered an **ITU**-International linkset if it's adjacent point code is an **ITU**-International **PC**. An **MSU** is **ITU**-National if it is received on an **ITU** linkset (National or International), and the **NIC** field in the **SIO** is set to 2 (National).

ITU-International linksets do not have a group code. **ITU**-National **MSUs** received on **ITU**-International linksets will be assigned a group code of aa.

Existing ITU National Destinations

Any **ITU**-National destinations that were entered before Release 26.05 or before the **ITU** National Duplicate Point Codes feature was turned on will be assigned the group code of aa.

Interaction with Other Features

Gateway Screening

For example, in the network in Figure 2-4, if the user wanted to screen out **MSU** coming from 6217 in Group ge, but allow **MSUs** coming from 6217 in Group fr, he or she could assign different screensets to **LSB1** and **LSB2**. The screenset assigned to **LSB1** would allow **MSUs** from **OPC** 6217. The screenset assigned to **LSB2** would block **MSUs** from **OPC** 6217.

Multiple Point Codes

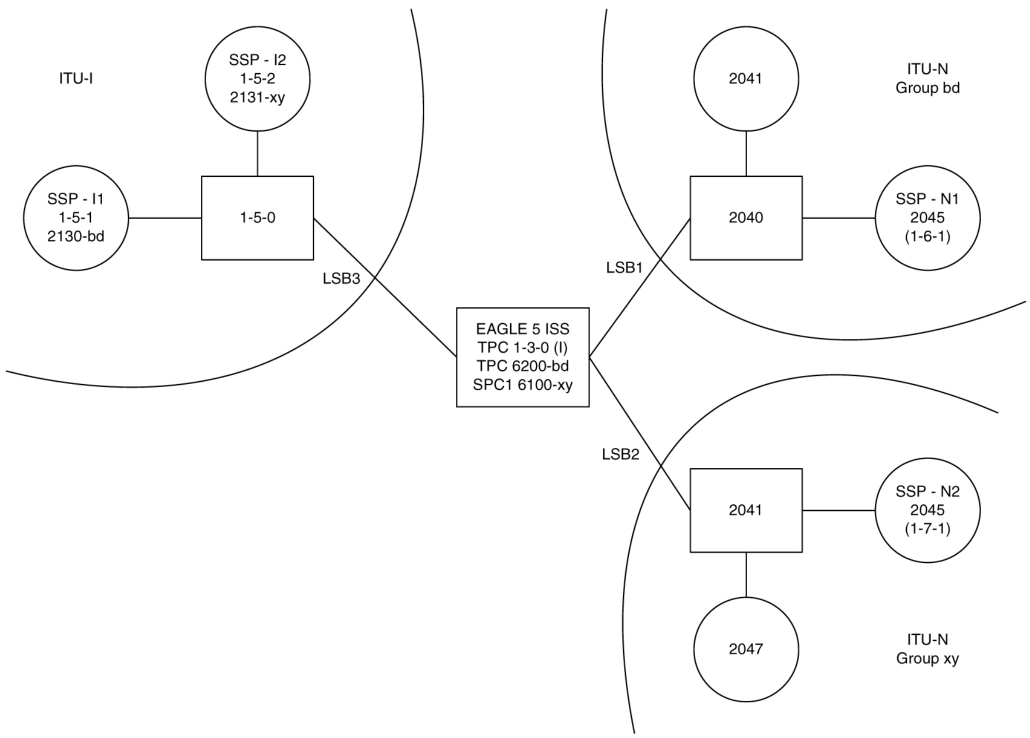
The Multiple Point Codes feature (see “Multiple Point Code Support”) must be on in order to turn on the **ITU** National Duplicate Point Codes feature. For every group that is used, the user must provision either a True **PC** or **Secondary Point Code**, using the `chg-sid` command.

For example, in the network in Figure 2-4, two groups are used having group codes of fr and ge. An **ITU**-National **True Point Code** is entered for group fr, and an **ITU**-National Secondary Point code is entered for group ge.

Conversion between ITU-N and ITU-I or ANSI

Each **ITU**-N destination and group code can have its own **ITU**-I or **ANSI** alias **PC**. Each **ITU**-I or **ANSI** node can be assigned one **ITU**-N destination. For conversion from **ITU**-I or **ANSI** to **ITU**-N to succeed, the **ITU**-N alias of the sending node must have the same group code as the destination's group code. So each **ITU**-I or **ANSI** node can only send and receive messages from one **ITU**-N group.

Figure 2-5 Network for Conversion



In Figure 2-5, **SSP**-N1 (2045-bd) is assigned **ITU**-I alias 1-6-1, and **SSP**-N2 (2045-xy) is assigned **ITU**-I alias 1-7-1. **SSP**-I1 is assigned **ITU**-N alias 2130-bd and **SSP**-I2 is assigned **ITU**-N alias 2131-xy. In this example, **SSP**-I1 can exchange traffic with nodes in group bd, but not nodes in group xy. **SSP**-I2 can exchange traffic with nodes in group xy, but not nodes in group bd.

SSP-I1 (1-5-1) can send to **SSP**-N1 by using the **ITU**-I alias 1-6-1, But if **SSP**-I1 tries to send to 2045-xy by using the **ITU**-I alias 1-7-1, conversion will fail, and the **EAGLE** will generate **UIM** 1091 (Indicating **OPC** conversion failed).

SSP-N1 can send traffic to **SSP**-I1, but **SSP**-N2 cannot send traffic to **SSP**-I1. **SSP**-N1 sends an **ITU**-N **MSU** with **DPC** set to 2130. The **EAGLE** assigns a group code of bd to the **MSU** based on the incoming linkset. The **EAGLE** then looks up 2130-bd, determines that this is an alias for **ITU**-I 1-5-1, and routes the **MSU** to **SSP**-I1.

If **SSP**-N2 sends an **ITU**-N **MSU** with **DPC** set to 2130, the **EAGLE** assigns a group code of xy to the **MSU** based on the incoming linkset. The **EAGLE** then looks up 2130-xy, does not find a match, and discards the **MSU**.

To provision the **SSP**-N1, **SSP**-N2, **SSP**-I1, and **SSP**-I2 in the network shown in Figure 2-5, the following commands are used:

```
ent-dstn:dpcn=2045-bd:aliasi=1-6-1

ent-dstn:dpcn=2045-xy:aliasi=1-7-1

ent-dstn:dpci=1-5-1:aliasn=2130-bd

ent-dstn:dpci=1-5-2:aliasn=2131-xy

ent-rte:dpcn=2045-bd:lsn=LSB1:rc=10
```

```
ent-rte:dpcn=2045-xy:lsn=LSB2:rc=10

ent-rte:dpci=1-5-1:lsn=LSB3:rc=10

ent-rte:dpci=1-5-2:lsn=LSB3:rc=10
```

Limitations

The **ITU** National Duplicate **Point Code** feature has the following limitations:

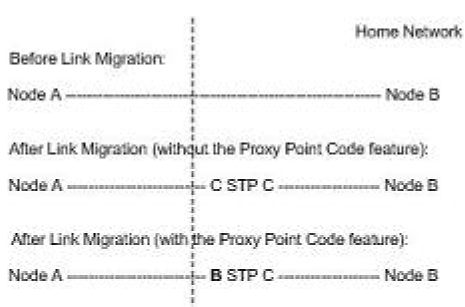
- Duplicate Point Codes are only supported for **ITU**-National Destinations.
- **ITU**-National traffic from a group must be destined for a **PC** within the same group.
- No duplicate point codes are allowed within a group.
- For each group that is provisioned, a separate **ITU**-N C-linkset must be provisioned.
- It is not possible to change a destination's group code. If the user wants to move a destination from one group to another, the user must provision a new destination that uses the new group code and delete the old destination.
- If conversion between **ITU**-N and **ITU**-I or **ANSI** is used, only 1 **ITU**-N group can send traffic to a specific **ANSI** or **ITU**-I node.

2.5 Proxy Point Codes

The Proxy Point Code feature allows the EAGLE to assume the point codes of other nodes in order to ease the migration of deploying an STP in a network with direct-connect links into other networks. For example, if a foreign network SS7 node is directly connected to an SS7 node in the home network, an EAGLE can be deployed so that the transition is transparent to the foreign node. The foreign node can still behave as if it is connected to the original node in the home network. EAGLE will provide routing connectivity in the home network to the foreign node and will allow the foreign node to connect to the home network.

In the examples in Figure 2-6, foreign network Node A connects to home network Node B. Normally, STP C would connect between them, requiring both Node A and Node B to use STP C as the APC. With this feature, Node A does not require any modifications, as STP C provides a proxy point code B. The configuration in this example assume that the self point code of the STP is C.

Figure 2-6 Context of the Proxy Point Code in the Network



A proxy point code can be any of these types of point codes:

- ANSI

- ITU-I
- ITU-I Spare
- 14-bit ITU-N
- 14-bit ITU-N Spare
- 24-bit ITU-N

A proxy point code must be a full point code and cannot be a cluster point code or a network routing point code. Private point codes and secondary point codes cannot be used as a proxy point code.

The following types of signaling links can be assigned to a linkset whose adjacent point code is a proxy point code:

- LSL
- ATM-HSL (LIM-ATM and E1-ATM are supported)
- SE-HSL
- M2PA.

Feature Provisioning Requirements

The EAGLE can contain a maximum of 100 proxy point codes. The proxy point code quantity is enabled in groups of 10 proxy point codes with the `enable-ctrl-feat` command and these part numbers shown in Table 2-3.

Table 2-3 Proxy Point Code Quantities and Part Numbers

Part Number	Proxy Point Code Quantity
893-0187-01	10
893-0187-02	20
893-0187-03	30
893-0187-04	40
893-0187-05	50
893-0187-06	60
893-0187-07	70
893-0187-08	80
893-0187-09	90
893-0187-10	100

Once a proxy point code quantity has been enable, the quantity cannot be decreased.

A temporary feature access key cannot be used to enabled a proxy point code quantity.

Once a proxy point code quantity has been enabled, the proxy point codes are provisioned in the database with the `ent-dstn` command and the `prx` parameter. Other point codes can use a proxy point code that is already provisioned in the database. These point codes are provisioned with the `ent-dstn` command and the `ppc` parameter.

After the proxy point code has been provisioned in the database, a linkset using the proxy point code can be provisioned in the database. This linkset, referred to as a proxy linkset, is provisioned using the `ent-ls` command with the adjacent point code of the linkset, the `lst=prx` parameter, and the `ppc` parameter. The `ppc` parameter value is the proxy point code provisioned with the `ent-dstn` command.

A proxy linkset has the same characteristics as an A linkset.

A proxy point code can be assigned to a maximum of 10 linksets.

Secondary adjacent point codes are not supported on a proxy linkset.

A proxy point code cannot be used as the adjacent point code of an IPGWx linkset.

To provision the Proxy Point Code feature, perform these procedures.

1. Enable a proxy point code quantity using the `enable-ctrl-feat` command. Perform Changing the Proxy Point Code Quantity. Once a proxy point code quantity is enabled, the Proxy Point Code feature is enabled and turned on. The `chg-ctrl-feat` command cannot be used to turn the Proxy Point Code feature on.
2. Provision the proxy point code using the `ent-dstn` command with the `prx` and `ppc` parameters. Perform Adding a Destination Point Code.
3. Provision the proxy linkset using the `ent-ls` command with the `lst=prx` and `ppc` parameters. Perform Adding an SS7 Linkset .

2.6 Changing the Proxy Point Code Quantity

This procedure is used to increase the number of **proxy point codes** that are allowed in the **EAGLE**. The **EAGLE** can contain a maximum of 100 proxy point codes.

The `enable-ctrl-feat` command enables the proxy point code quantity, in groups of 10 proxy point codes, by specifying the part number for the proxy point code quantity and the proxy point code quantity's feature access key with these parameters:

> **Note:**
>
> As of Release 46.3, the `fak` parameter is no longer required. This parameter is only used for backward compatibility.

`:fak`- The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive. If you do not have the feature access key for the proxy point code quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

`:partnum` – The Oracle-issued part number for the proxy point code quantity shown in the following table:

Table 2-4 Proxy Point Code Quantities and Part Numbers

Part Number	Proxy Point Code Quantity
893018701	10
893018702	20
893018703	30
893018704	40
893018705	50

Table 2-4 (Cont.) Proxy Point Code Quantities and Part Numbers

Part Number	Proxy Point Code Quantity
893018706	60
893018707	70
893018708	80
893018709	90
893018710	100

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Once the proxy point code quantity is enabled with the `enable-ctrl-feat` command, the proxy point code is also turned on. The `chg-ctrl-feat` command is not necessary to turn on the proxy point code quantity.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
```

```
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If a proxy point code quantity is shown in the `rtrv-ctrl-feat` output, continue the procedure with Oracle.

If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with Oracle. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed.

If a proxy point code quantity is not shown in the `rtrv-ctrl-feat` output, continue the procedure with 2.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231
System serial number is not locked.
rlghncxa03w 07-10-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with Oracle. If the serial number is correct but not locked, continue the procedure with 5. If the serial number is not correct, but is locked, a proxy point code quantity cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

```
ent-serial-num:serial=<EAGLE’s correct serial number>
```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231
System serial number is not locked.
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

   If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2 , if the serial number shown in 2 is correct, or with the serial number shown in 4 , if the serial number was changed in 3 , and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Enable a proxy point code quantity with the `enable-ctrl-feat` command specifying the part number for the proxy point code quantity and the feature access key.

   For this example, enter this command.

   `enable-ctrl-feat:partnum=893018703:fak=<30 proxy point codes feature access key>`

> **Note:**
>
> A temporary feature access key cannot be specified to enable the proxy point code quantity.

> **Note:**
>
> The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the proxy point code quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

7. Verify the changes by entering the `rtrv-ctrl-feat` command with the proxy point code quantity part number specified in Oracle .

   For this example, enter this command.

   `rtrv-ctrl-feat:partnum=893018703`

   The following is an example of the possible output.

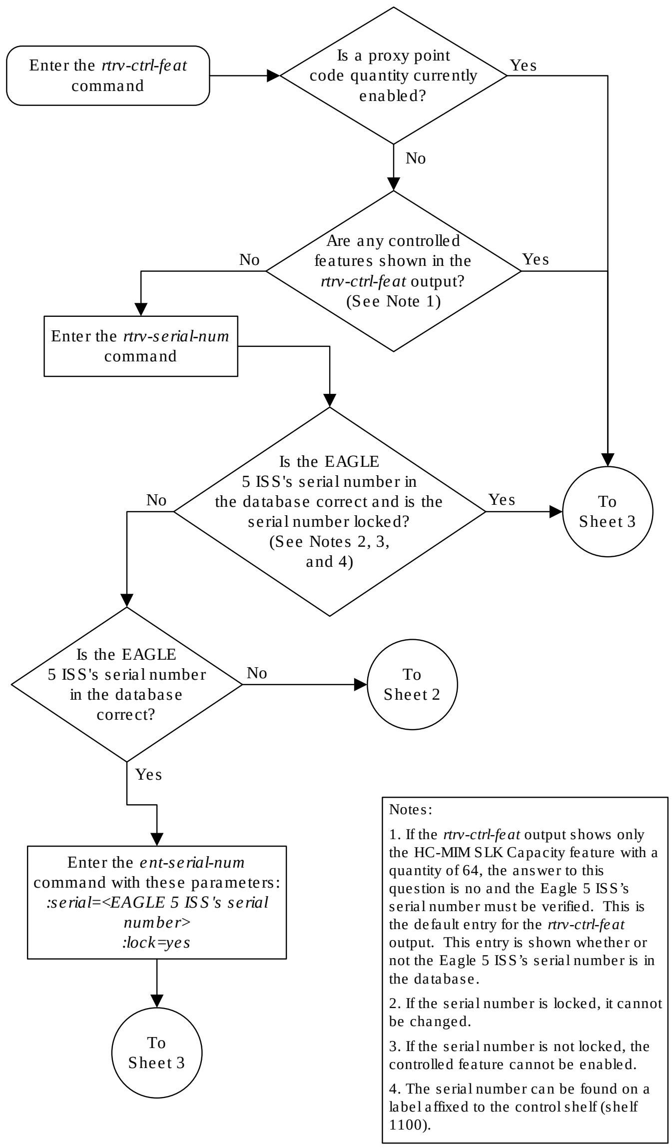
```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Proxy Point Code          893018703  on      30

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

8. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

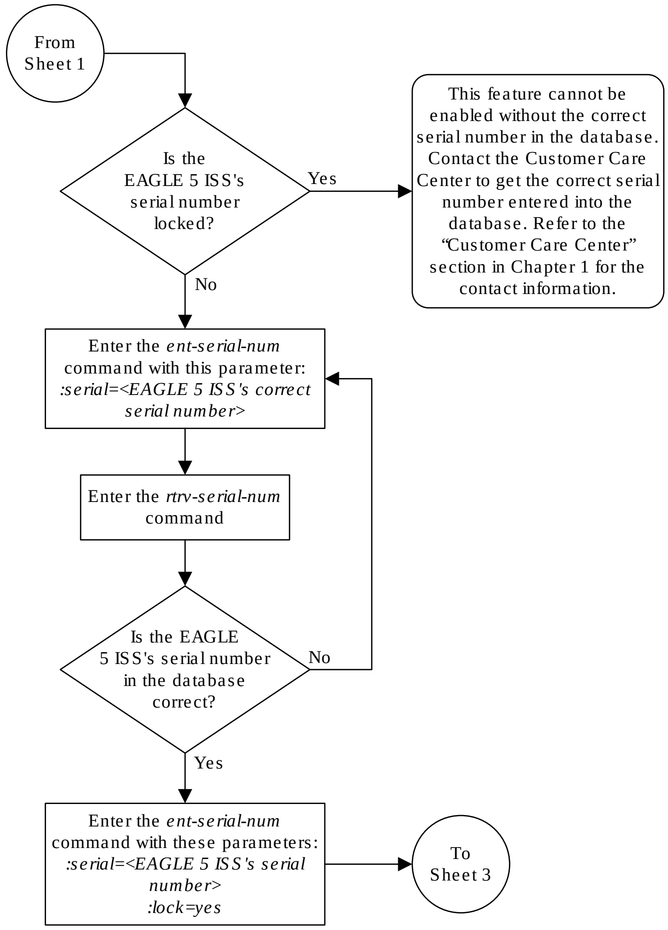
   The following messages should appear. The active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

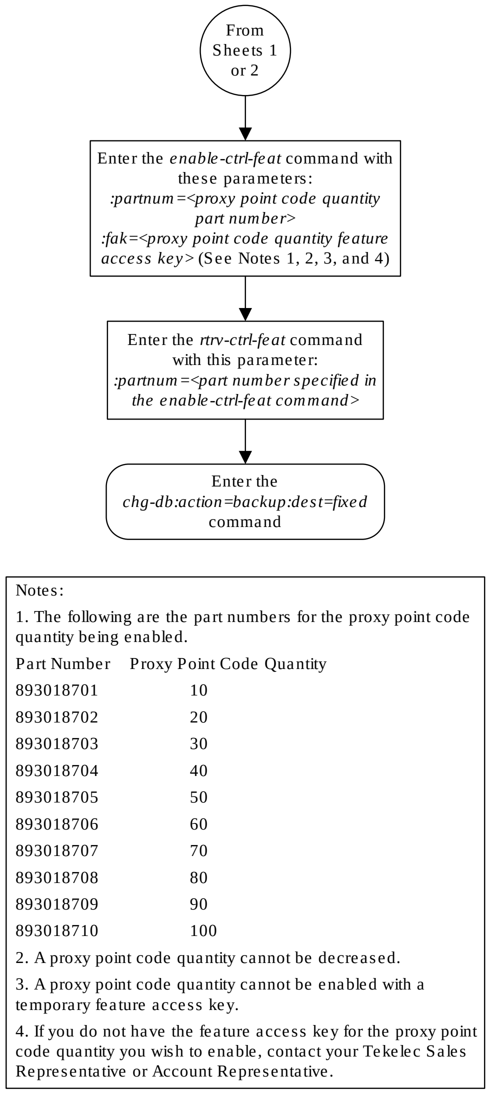
Figure 2-7 Changing the Proxy Point Code Quantity



Sheet 1 of 3


From Sheet 1
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the ent-serial-num command with this parameter: :serial=<EAGLE 5 ISS's correct serial number>
Enter the rtrv-serial-num command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the ent-serial-num command with these parameters: :serial=<EAGLE 5 ISS's serial number> :lock=yes
To Sheet 3

Sheet 2 of 3



Sheet 3 of 3

2.7 Changing the DPC Quantity

This procedure is used to increase the number of **DPCs** that are allowed in the EAGLE beyond what is currently shown in the `ent-dstn`, `dlt-dstn`, `chg-dstn`, and `rtrv-dstn` outputs. The EAGLE can contain a maximum of one of these quantities: 2000 (system default), 5000, 6000, 7000, 8000, or 10,000 DPCs.

To have more than 2000 DPCs in the EAGLE, the 5000 Routes feature must be turned on using the `chg-feat` command. Turning on the 5000 Routes features allows the EAGLE to contain a maximum of 5000 DPCs. To have more than 5000 DPCs in the

EAGLE, either 6000, 7000, or 8000, or 10,000 routesets must be enabled using the `enable-ctrl-feat` command, in addition to having the 5000 Routes feature turned on. Enabling 6000, 7000, 8000, or 10,000 routesets allows the EAGLE to contain a maximum of 6000, 7000, 8000, or 10,000 DPCs. The `rtrv-ctrl-feat` command shows whether or not 6000, 7000, 8000, or 10,000 routesets are enabled. The `rtrv-feat` command shows whether or not the 5000 Routes feature is turned on.

> **Note:**
>
> Once the 5000 Routes feature is turned on with the `chg-feat` command, it cannot be turned off.
> The 5000 Routes feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the 5000 Routes feature, contact your Oracle Sales Representative or Account Representative.

Once the maximum **DPC** quantity is set, the actual number of DPCs allowed in the EAGLE is configured using the `mtpdpcq` parameter of the `chg-stpopts` command. The `rtrv-stpopts` command output, as well as the outputs of the `ent-dstn`, `dlt-dstn`, `chg-dstn`, and `rtrv-dstn` commands, shows the actual number of DPCs allowed in the EAGLE.

If the **Cluster** Routing and Management Diversity feature is turned on, (shown by the entry `CRMD = on` in the `rtrv-feat` output) the `mtpxlq` parameter is also shown in the `rtrv-stpopts` output. The `mtpxlq` parameter defines the maximum number of entries that the exception list (x-list) for the Cluster Routing and Management Diversity feature can contain. The value of the `mtpxlq` parameter of the `chg-stpopts` command can also be changed to more than 2000 destination point codes. For more information on exception lists, see the "Exception Lists (X-lists)" in the Cluster Routing and Management Diversity (CRMD) section.

The `enable-ctrl-feat` command enables 6000, 7000, 8000, or 10,000 routesets by inputting the part number for the routeset quantity and the routeset quantity’s feature access key with these parameters.

`:partnum` – The Oracle-issued part number for the routeset quantity:

- For 6000 routesets - 893006401
- For 7000 routesets - 893006402
- For 8000 routesets - 893006403
- For 10,000 routesets - 893006405

`:fak` – The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive.

> **Note:**
>
> The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the routeset quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

The `enable-ctrl-feat` command requires a valid serial number for the EAGLE to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the EAGLE's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

To enable 7000 or 8000 routesets, the DPC table can contain no more than 8000 alias point codes. To enable 10,000 routesets, the DPC table can contain no more than 10,000 alias point codes. The number of alias point codes configured in the EAGLE is shown in the output of the `ent-dstn`, `dlt-dstn`, `chg-dstn`, and `rtrv-dstn` command outputs in one of two ways, depending on whether or not the Cluster Routing and Management Diversity feature is on or off.

If the Cluster Routing and Management Diversity feature is off.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
Destination table is (10 of 8000) 1% full
Alias table is (8 of 8000) 1% full
RTRV-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is on.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
DESTINATION ENTRIES ALLOCATED:   8000
    FULL DPC(s):                    9
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 1
    TOTAL DPC(s):                  10
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                   8
```

```
    CAPACITY (% FULL):              1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

To set the alias point code quantity below 8000 if 7000 or 8000 routesets will be enabled, or 10,000 if 10,000 routesets will be enabled, perform the Changing a Destination Point Code procedure. The alias point codes are removed using this procedure.

The routeset quantities (6000, 7000, 8000, or 10,000) cannot be temporarily enabled (with a temporary feature access key) and cannot be disabled with the `chg-ctrl-feat` command and the `status=off` parameter. The routeset quantity cannot be decreased to a smaller quantity once a quantity is enabled. For example, if the current routeset quantity of the EAGLE is 7000 routesets, the quantity cannot be reduced to 6000 routesets.

Once any of these routeset quantities are enabled with the `enable-ctrl-feat` command, they are also activated. The `chg-ctrl-feat` command is not necessary to activate these routeset quantities.

To enable 10,000 routesets, the EAGLE can contain only E5-based control cards. Refer to Maintenance and Administration Subsystem for more information about the control cards.

1. Display the DPC quantity currently allowed in the EAGLE by entering the `rtrv-stpopts` command.

   The DPC quantity is displayed in the `MTPDPCQ` field of the output. This is an example of the possible output.

   ```
   rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
   STP OPTIONS
   -----------------------
   MTPDPCQ            1750
   ```

   > **Note:**
   >
   > The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

   The `MTPDPCQ` value cannot exceed one of these totals depending on the features that are enabled or turned on.

   - 2000 – if the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
   - 5000 – if the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
   - 6000 – if 6000 routesets are enabled.
   - 7000 – if 7000 routesets are enabled.
   - 8000 – if 8000 routesets are enabled.
   - 10,000 – if 10,000 routesets are enabled.

If the Cluster Routing and Management Diversity feature is on, the `MTPXLQ` field will be shown in the `rtrv-stpopts` command output. The `MTPXLQ` field shows the maximum number of entries the exception list (x-list) can contain. The sum of the `MTPDPCQ` and `MTPXLQ` values cannot exceed one of these totals depending on the features that are enabled or turned on.

- 2500 – if the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
- 5500 – if the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
- 6500 – if 6000 routesets are enabled.
- 7500 – if 7000 routesets are enabled.
- 8500 – if 8000 routesets are enabled.
- 10,500 – if 10,000 routesets are enabled.

For more information on the Cluster Routing and Management Diversity feature, see the Cluster Routing and Management Diversity (CRMD) section.

Perform one of the following steps based on the `MTPDPCQ` value (or `MTPDPCQ` and `MTPXLQ` values) shown in the `rtrv-stpopts` output. The values shown in parentheses are the sum of the `MTPDPCQ` and `MTPXLQ` values.

- 8001 - 10,000 (8501 - 10,500) – 10,000 routesets are enabled. The only action that can be performed is to change the DPC quantity using the `chg-stpopts` command. This is the maximum number of routesets the EAGLE can have. Continue the procedure with 14 to change the DPC quantity. If you do not wish to change the DPC quantity, this procedure is finished.
- 7001 - 8000 (7501 - 8500) – 8000 routesets are enabled. To enable the 10,000 routeset quantity, continue the procedure with 11. If you wish to change the DPC quantity and not enable 10,000 routesets, continue the procedure with 14. If you do not wish to enable 10,000 routesets or change the DPC quantity, this procedure is finished.
- 6001 - 7000 (6501 - 7500) – 7000 routesets are enabled. To enable the 8000 routeset quantity, continue the procedure with Oracle. To enable the 10,000 routeset quantity, continue the procedure with 11. If you wish to change the DPC quantity and not enable 8000 or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 8000 or 10,000 routesets or change the DPC quantity, this procedure is finished.
- 5001 - 6000 (5501 - 6500) – 6000 routesets are enabled. To enable 7000, or 8000, 10,000 routesets, continue the procedure with 10. To enable the 10,000 routeset quantity, continue the procedure with 11. If you wish to change the DPC quantity and not enable 7000, 8000, or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 7000, 8000, or 10,000 routesets or change the DPC quantity, this procedure is finished.
- 2001 - 5000 (2501 - 5500) – The 5000 Routes feature is on. To enable 6000, 7000, 8000, or 10,000 routesets, perform 2. If you wish to change the DPC quantity and not enable 6000, 7000, 8000, or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 6000, 7000, 8000, or 10,000 routesets or change the DPC quantity, this procedure is finished.
- 2000 or less (2500 or less) – Continue the procedure with 2.

2. Verify that 6000, 7000, 8000, or 10,000 routesets are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If 10,000 routesets are enabled, the `Routesets` row appears in the `rtrv-ctrl-feat` output with a quantity of 10,000. The only action that can be performed is to change the DPC quantity using the `chg-stpopts` command. This is the maximum number of routesets the EAGLE can have. Continue the procedure with 14 to change the DPC quantity. If you do not wish to change the DPC quantity, this procedure is finished.

   If 8000 routesets are enabled, the `Routesets` row appears in the `rtrv-ctrl-feat` output with a quantity of 8000. To enable 10,000 routesets, continue the procedure with 11. If you wish to change the DPC quantity and not enable 10,000 routesets, continue the procedure with 14. If you do not wish to enable 10,000 routesets or change the DPC quantity, this procedure is finished.

   If 7000 routesets are enabled, the `Routesets` row appears in the `rtrv-ctrl-feat` output with a quantity of 7000. To enable 8000 routesets, continue the procedure with Oracle. To enable 10,000 routesets, continue the procedure with 11. If you wish to change the DPC quantity and not enable 8000 or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 8000 or 10,000 routesets or change the DPC quantity, this procedure is finished.

   If 6000 routesets are enabled, the `Routesets` row appears in the `rtrv-ctrl-feat` output with a quantity of 6000. To enable 7000 or 8000, 8000, or 10,000 routesets, continue the procedure with 10. To enable 10,000 routesets, continue the procedure with 11. If you wish to change the DPC quantity and not enable 7000, 8000, or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 7000, 8000, or 10,000 routesets or change the DPC quantity, this procedure is finished.

   If 6000, 7000, 8000, or 10,000 routesets are not enabled, continue the procedure with 3.

3. Enter the `rtrv-feat` command to verify that the 5000 Routes feature is turned on.

   If the 5000 Routes feature is on, the `DSTN5000 = on` entry appears in the output.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in the *Commands Manual*.

   If the 5000 Routes feature is not on, and you do not wish to turn the 5000 Routes feature on, or enable 6000, 7000, 8000, or 10,000 routesets, the only action that can be performed is to change the DPC quantity using the `chg-stpopts` command. However the DPC quantity can be no greater than 2000 DPCs (2500 DPCs if the `rtrv-stpopts` output in 1 contains the `MTPDPCQ` and `MTPXLQ` parameters). Continue the procedure with 14 to change the DPC quantity. If you do not wish to change the DPC quantity, this procedure is finished.

   If the 5000 Routes feature is not on, and you wish to turn the 5000 Routes feature on, or enable 6000, 7000, 8000, or 10,000 routesets, continue the procedure with 4.

   If the 5000 Routes feature is on, continue the procedure with 6.

4. Turn the 5000 Routes feature on by entering this command.

   ```
   chg-feat:DSTN5000=on
   ```

   > **Note:**
   >
   > Once the 5000 Routes feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The 5000 Routes feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the 5000 Routes feature, contact your Oracle Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message appears.

   ```
   rlghncxa03w 07-05-28 11:43:04 GMT EAGLE5 37.0.0
   CHG-FEAT: MASP A - COMPLTD
   ```

5. Verify that the 5000 Routes feature is turned on, by entering the `rtrv-feat` command.

   If the 5000 Routes feature is on, the `DSTN5000 = on` appears in the command output.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide.*

If 6000, 7000, 8000, or 10,000 routesets are not being enabled, the only action that can be performed is to change the DPC quantity. If you wish to change the DPC quantity and not enable 6000, 7000, 8000, or 10,000 routesets, continue the procedure with 14. If you do not wish to enable 6000, 7000, 8000, or 10,000 routesets or change the DPC quantity, this procedure is finished.

If 6000, 7000, 8000, or 10,000 routesets are being enabled, go to 6.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure 10. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 6 through 9 must be performed.

If 6000, 7000, 8000, or 10,000 routesets are being enabled, the serial number of the EAGLE must be in the database and the serial number must be locked. If the `rtrv-ctrl-feat` output in 2 shows any features in addition to the HC-MIM SLK Capacity feature with a quantity of 64, the serial number is in the database and it is locked. Continue the procedure by performing one of these steps.

- If 6000 routesets are being enabled, continue the procedure with Oracle.
- If 7000, 8000, or 10,000 routesets are being enabled, continue the procedure with 10.

The HC-MIM SLK Capacity feature with a quantity of 64 is shown in the `rtrv-ctrl-feat` output in 2 whether or not the serial number of the EAGLE is in the database or whether or not the serial number is locked. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the status of the serial number must be verified. Continue the procedure with 6.

6. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231
System serial number is not locked.
rlghncxa03w 07-10-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with Oracle if 6000 routesets are being enabled. Continue the procedure with 10 if 7000, 8000, or 10,000 routesets are being enabled. If the serial number is correct but not locked, continue the procedure with 9. If the serial number is not correct, but is locked, 6000, 7000, 8000, or 10,000 routesets cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to the My Oracle Support (MOS) section for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

7. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

8. Verify that the serial number entered in 7 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231
   System serial number is not locked.
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   Command Completed
   ```

   If the serial number was not entered correctly, repeat 7 and 8 and re-enter the correct serial number.

9. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 6, if the serial number shown in 6 is correct, or with the serial number shown in 8, if the serial number was changed in 7, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

If 6000 routesets are not being enabled, continue the procedure with Oracle.

If 7000, 8000, or 10,000 routesets are not being enabled, continue the procedure with Oracle.

If 7000 routesets are currently enabled, and 8000 or 10,000 routesets are being enabled, continue the procedure with Oracle.

If 5000 or 6000 routesets are currently enabled and 7000, 8000, or 10,000 routesets are being enabled, continue the procedure with 10.

10. Verify the number of alias point codes configured in the EAGLE by entering the `rtrv-dstn` command with the `msar=only` parameter.

    To enable 7000 or 8000 routesets, the EAGLE can have no more than 8000 alias point codes.

    To enable 10,000 routesets, the EAGLE can have no more than 10,000 alias point codes.

    The `msar=only` parameter displays only the maximum numbers of different types of point codes the EAGLE can have and the actual numbers of the different types of point codes that are configured in the EAGLE.

    `rtrv-dstn:msar=only`

    One of two types of outputs are displayed, depending on whether or not the Cluster Routing and Management Diversity feature is on or off.

    If the Cluster Routing and Management Diversity feature is off:

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
Destination table is (10 of 8000) 1% full
Alias table is (8 of 8000) 1% full
RTRV-DSTN: MASP A - COMPLTD
```

    If the Cluster Routing and Management Diversity feature is on:

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
DESTINATION ENTRIES ALLOCATED:   8000
    FULL DPC(s):                    9
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 1
    TOTAL DPC(s):                  10
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                   8
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If 7000 or 8000 routesets are being enabled and the EAGLE contains more than 8000 alias point codes, perform the Changing a Destination Point Code procedure to reduce the number of alias point codes to an amount below 8000.

If 10,000 routesets are being enabled and the EAGLE contains more than 10,000 alias point codes, perform the Changing a Destination Point Code procedure to reduce the number of alias point codes to an amount below 10,000.

When this step has been completed, continue the procedure by performing one of these steps.

- If 7000 or 8000 routesets are being enabled, continue the procedure with Oracle.
- If 10,000 routesets are being enabled, continue the procedure with 11.

11. Display the control cards in the EAGLE by entering this command.

    `rtrv-stp:gpl=oamhc`

    This is an example of the possible output.

```
rlghncxa03w 10-12-01 16:07:48 GMT  EAGLE5 43.0.0

Card  Part Number  Rev Serial Number  Type     DB     APPL     GPL
Version
----  -----------  --- -------------  ----     --     ----
-----------
1113  870-2903-01  C   10206255064    E5MCAP   1024M  OAMHC
132-018-000
1115  870-2903-01  C   10206255165    E5MCAP   1024M  OAMHC
132-018-000

Command Completed.
```

    To enable 10,000 routesets, E5-MCAP cards must be installed in card locations 1113 and 1115. If E5-MCAP cards are not shown in either card location 1113 or 1115, install the E5-MCAP cards in card locations 1113 or 1115 as required. Contact the Customer Care Center before installing the E5-MCAP cards. Refer to the My Oracle Support (MOS) section for the contact information.

    After the E5-MCAP cards have been installed, or if E5-MCAP cards are shown in card locations 1113 and 1115 in the `rtrv-stp` output, continue the procedure with Oracle.

12. Enable the routeset quantity with the `enable-ctrl-feat` command specifying the part number for the routeset quantity and the feature access key.

    - To enable 6000 routesets, enter this command.
      `enable-ctrl-feat:partnum=893006401:fak=<6000 Routesets feature access key>`
    - To enable 7000 routesets, enter this command.
      `enable-ctrl-feat:partnum=893006402:fak=<7000 Routesets feature access key>`
    - To enable 8000 routesets, enter this command.
      `enable-ctrl-feat:partnum=893006403:fak=<8000 Routesets feature access key>`

- To enable 10,000 routesets, enter this command.
  `enable-ctrl-feat:partnum=893006405:fak=<10,000 Routesets feature access key>`

Note:

A temporary feature access key cannot be specified to enable the routeset quantity.

Note:

The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the routeset quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

13. Verify the changes by entering the `rtrv-ctrl-feat`command with the routeset quantity part number specified in Oracle.
    - If 6000 routesets was enabled, enter this command.
      `rtrv-ctrl-feat:partnum=893006401`

      The following is an example of the possible output.

      ```
      rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
      The following features have been permanently enabled:

      Feature Name              Partnum    Status  Quantity
      Routesets                 893006401  on      6000

      The following features have been temporarily enabled:

      Feature Name              Partnum    Status  Quantity     Trial
      Period Left
      Zero entries found.

      The following features have expired temporary keys:

      Feature Name              Partnum
      Zero entries found.
      ```

    - If 7000 routesets was enabled, enter this command.
      `rtrv-ctrl-feat:partnum=893006402`

The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Routesets                 893006402  on      7000

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

- If 8000 routesets was enabled, enter this command.
  `rtrv-ctrl-feat:partnum=893006403`

  The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Routesets                 893006403  on      8000

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

- If 10,000 routesets was enabled, enter this command.
  `rtrv-ctrl-feat:partnum=893006405`

  The following is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 42.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Routesets                 893006405  on      10000

The following features have been temporarily enabled:
```

```
Feature Name               Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name               Partnum
Zero entries found.
```

Continue the procedure by performing one of these steps.

- If the DPC quantity or exception list quantity are not being changed, continue the procedure with 16.
- If the DPC quantity or exception list quantity are being changed, continue the procedure with 14.

14. Change the maximum number of destination point codes that the EAGLE can contain by entering the `chg-stpopts` command with the `mtpdpcq` parameter.

    The values that can be specified with the `mtpdpcq` parameter is shown in the following list.

    - 500 to 2000 – if the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
    - 500 to 5000 – if the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled.
    - 500 to 6000 – if 6000 routesets are enabled.
    - 500 to 7000 – if 7000 routesets are enabled.
    - 500 to 8000 – if 8000 routesets are enabled.
    - 500 to 10000 – if 10000 routesets are enabled.

    For this example, enter this command.

    `chg-stpopts:mtpdpcq=7350`

    When this command has successfully completed, this message should appear.

    ```
    rlghncxa03w 07-05-07 00:22:57 GMT  EAGLE5 37.0.0
    CHG-STPOPTS: MASP A - COMPLTD
    ```

    If the `MTPXLQ` field (the exception list quantity) is shown in the `rtrv-stpopts` output in 1, and you wish to change only the `MTPXLQ` value, enter the `chg-stpopts` command with the `mtpxlq` parameter. For example, if you wish to change the exception list quantity to 1000 point codes, enter this command.`chg-stpopts:mtpxlq=1000`.

    Both the exception list quantity and the maximum of destination point codes can be changed, by entering the `chg-stpopts` command with both the `mptdpcq` and `mptxlq` parameters. For example, if you wish to change the exception list quantity to 1000 point codes and the maximum number of point codes to 6200, enter this command.

    `chg-stpopts:mtpxlq=1000:mtpdpcq=6750`

When specifying the `mtpxlq` parameter with the `chg-stpopts` command, the resulting sum of the `MTPDPCQ` and `MTPXLQ` values cannot be greater than the values shown in the following list.

- 2500 – if the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is from 500 to 2000.
- 5500 – if the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is from 500 to 5000.
- 6500 – if 6000 routesets are enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is from 500 to 6000.
- 7500 – if 7000 routesets are enabled. The range of values for the `mtpdpcq` parameter is from 500 to 7000. The range of values for the `mtpxlq` parameters is from 500 to 6000.
- 8500 – if 8000 routesets are is enabled. The range of values for the `mtpdpcq` parameter is from 500 to 8000. The range of values for the `mtpxlq` parameters is from 500 to 6000.
- 10500500 to 10500 – if 10000 routesets are enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is from 500 to 10,000.

15. Verify the changes using the `rtrv-stpopts` command.

    This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
MTPDPCQ           7350
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in the *Commands Manual*.

If the `mtpxlq` parameter was specified in 14, the `mtpxlq` parameter value will be shown in the `MTPXLQ` field of the `rtrv-stpopts` command output.

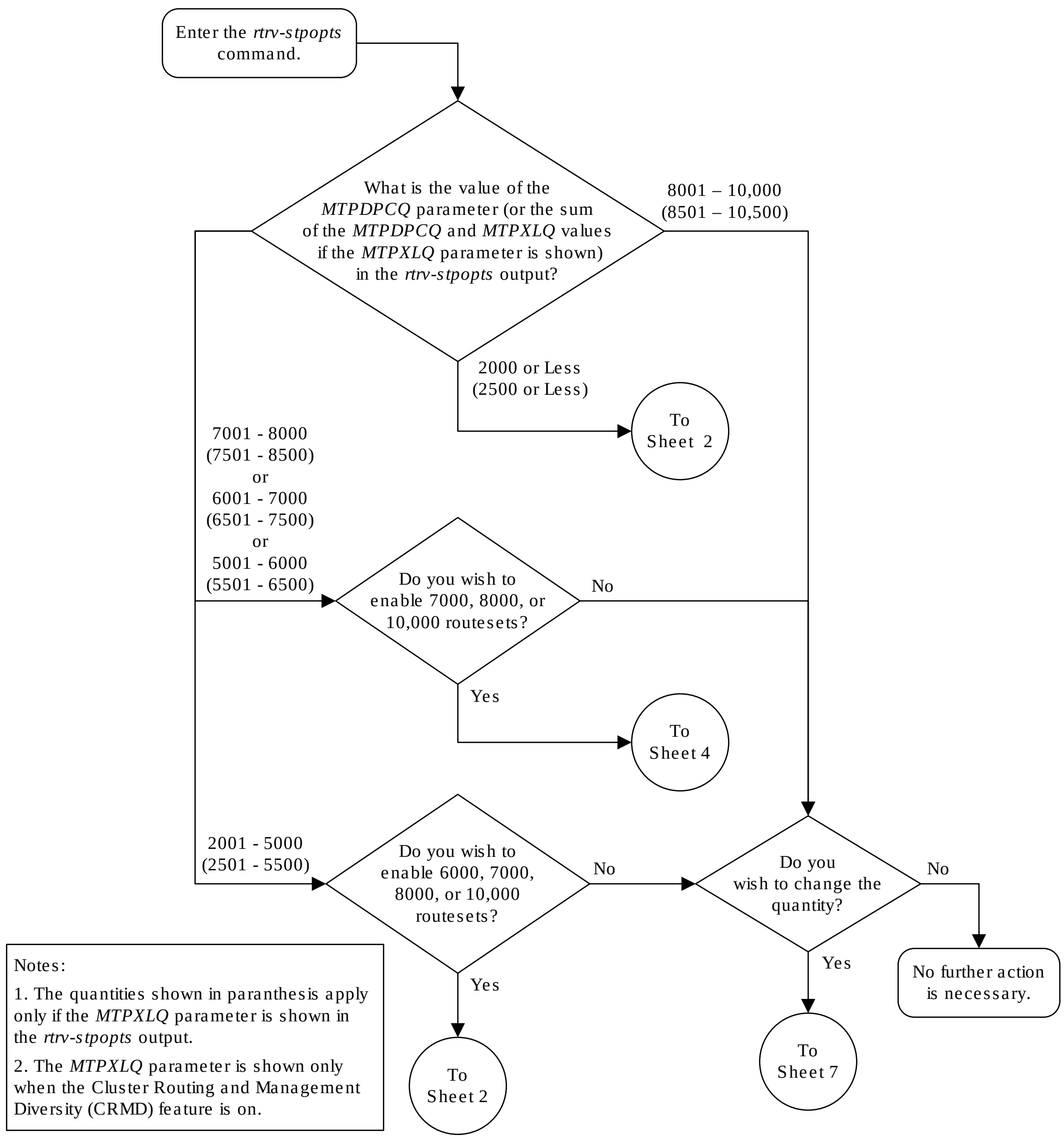
16. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

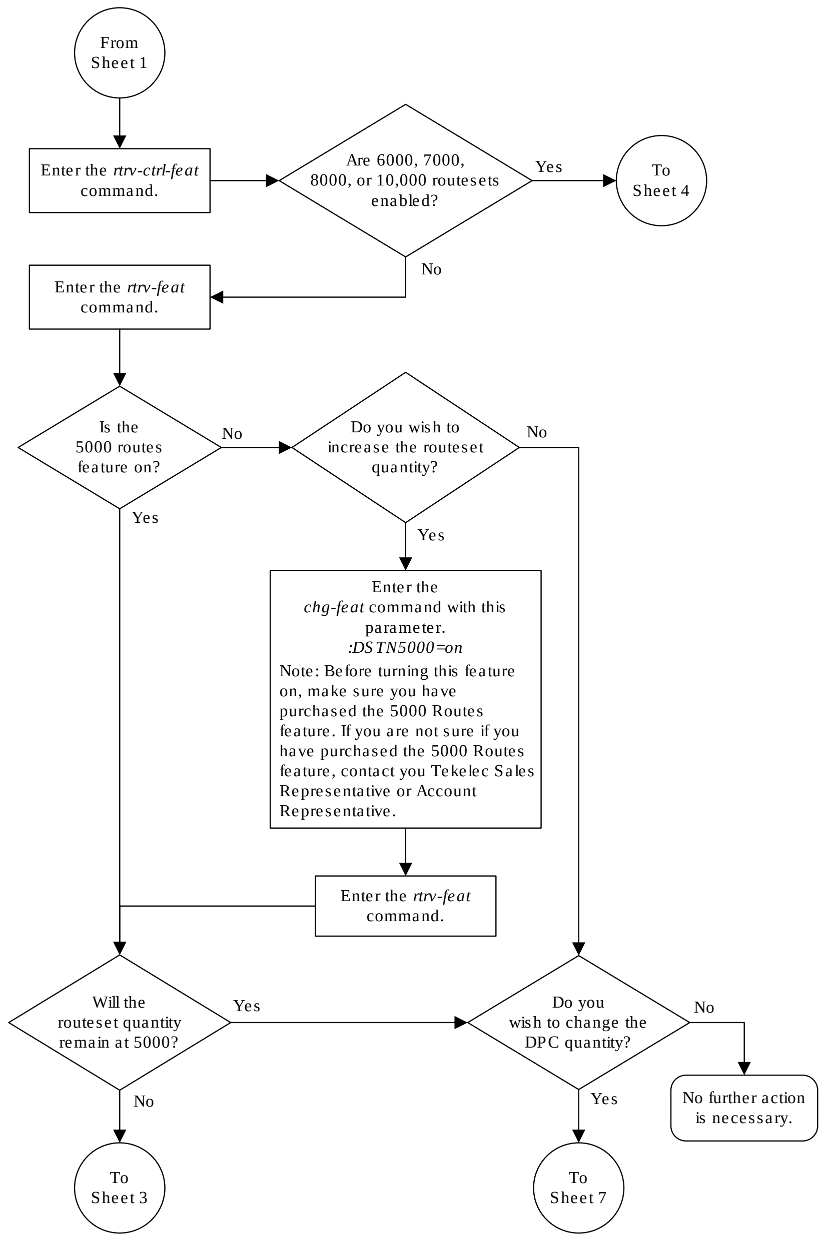
```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
```

```
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

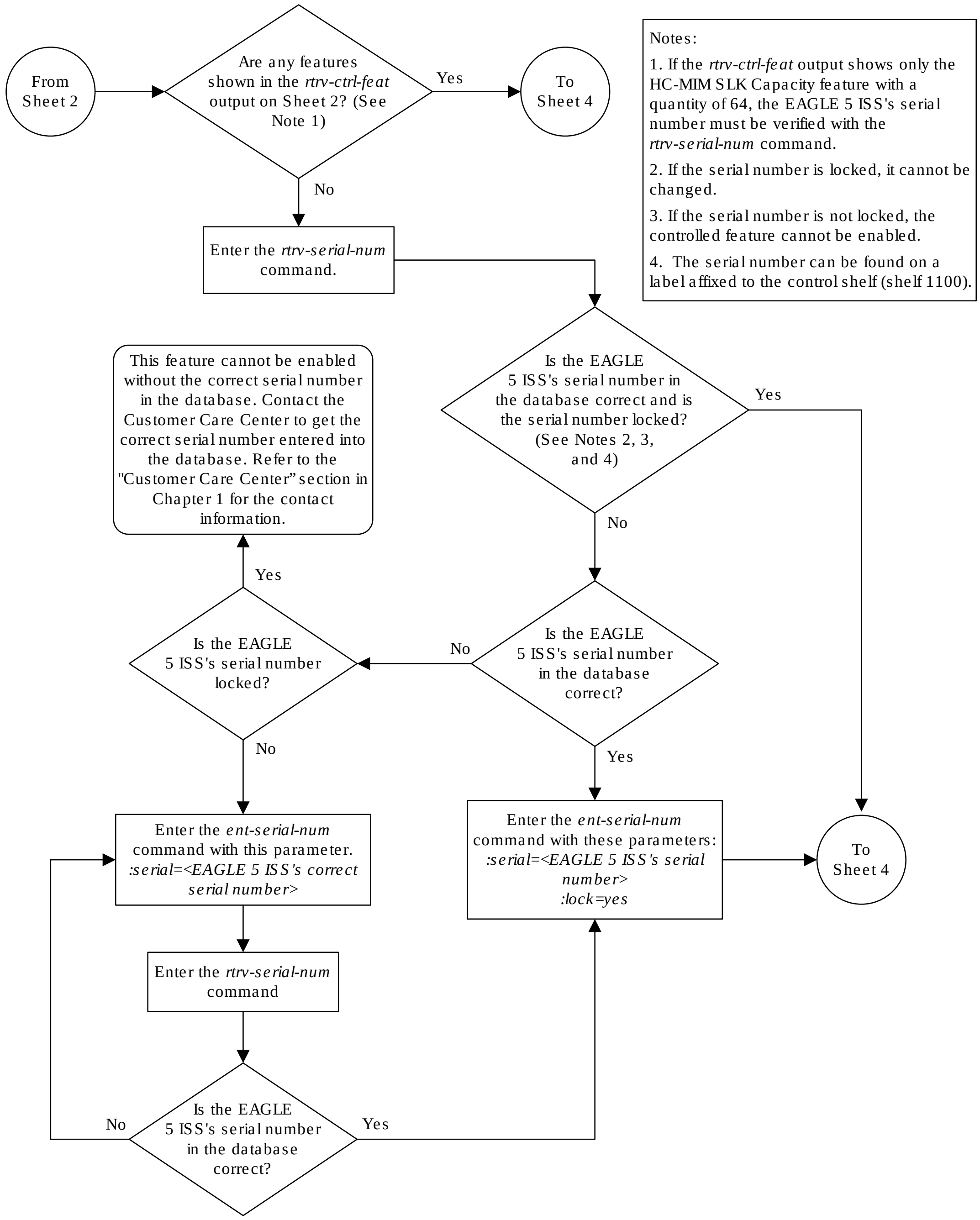
Figure 2-8 Changing the DPC Quantity



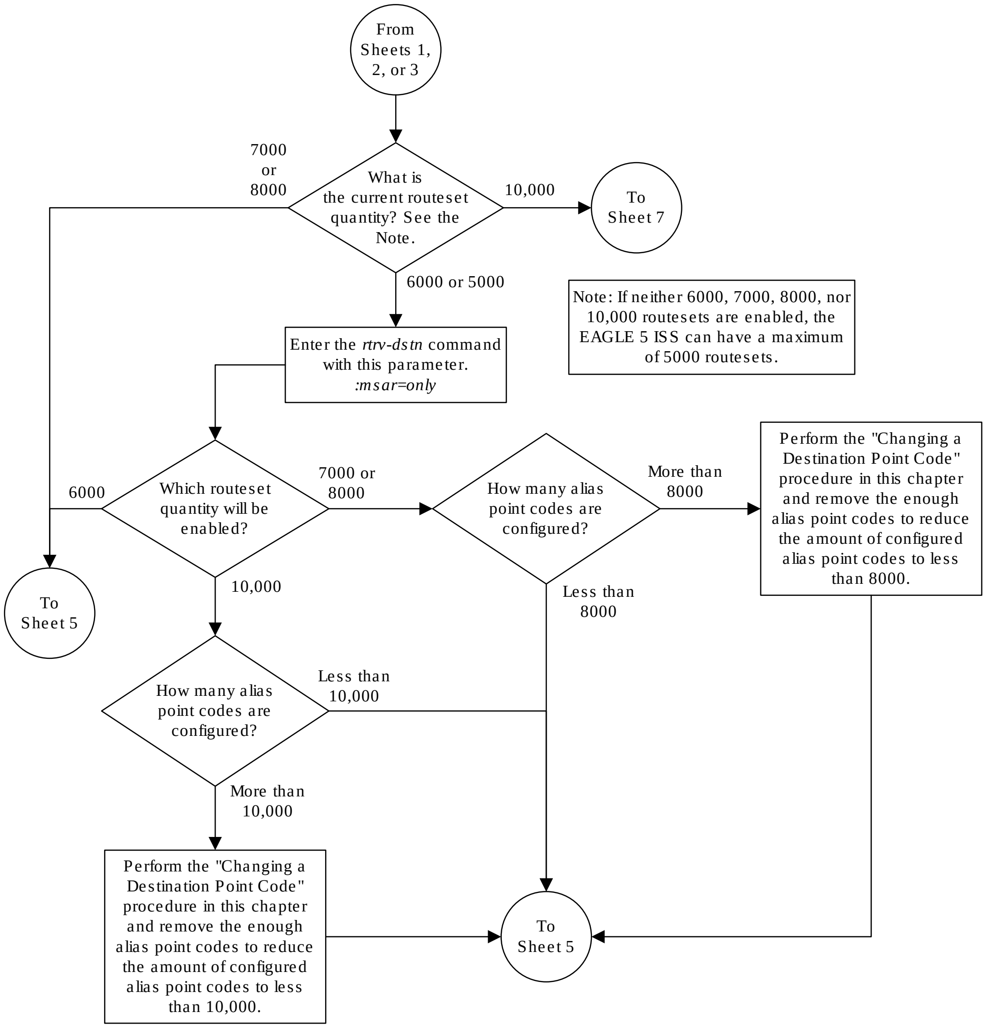
Sheet 1 of 8


From
Sheet 1
Enter the rtrv-ctrl-feat
command.
Are 6000, 7000,
8000, or 10,000 routesets
enabled?
Yes
To
Sheet 4
No
Enter the rtrv-feat
command.
Is the
5000 routes
feature on?
No
Do you wish to
increase the routeset
quantity?
No
Yes
Yes
Enter the
chg-feat command with this
parameter.
:DSTN5000=on
Note: Before turning this feature
on, make sure you have
purchased the 5000 Routes
feature. If you are not sure if you
have purchased the 5000 Routes
feature, contact you Tekelec Sales
Representative or Account
Representative.
Enter the rtrv-feat
command.
Will the
routeset quantity
remain at 5000?
Yes
Do you
wish to change the
DPC quantity?
No
No further action
is necessary.
No
Yes
To
Sheet 3
To
Sheet 7

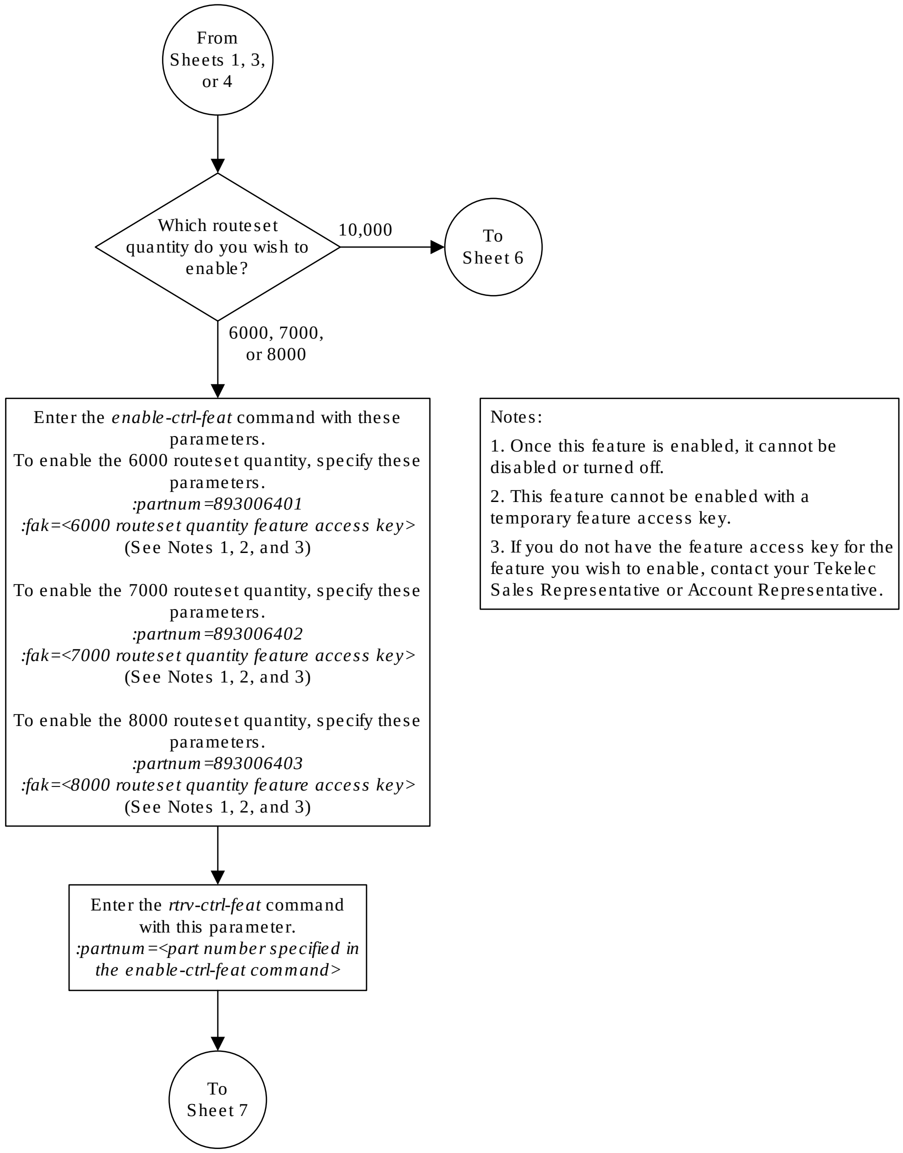
Sheet 2 of 8


From Sheet 2
Are any features shown in the rtrv-ctrl-feat output on Sheet 2? (See Note 1)
Yes
To Sheet 4
No
Enter the rtrv-serial-num command.
Notes:
1. If the rtrv-ctrl-feat output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the EAGLE 5 ISS's serial number must be verified with the rtrv-serial-num command.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
Yes
No
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Yes
Is the EAGLE 5 ISS's serial number locked?
No
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the ent-serial-num command with this parameter. :serial=<EAGLE 5 ISS's correct serial number>
Enter the ent-serial-num command with these parameters: :serial=<EAGLE 5 ISS's serial number> :lock=yes
To Sheet 4
Enter the rtrv-serial-num command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes

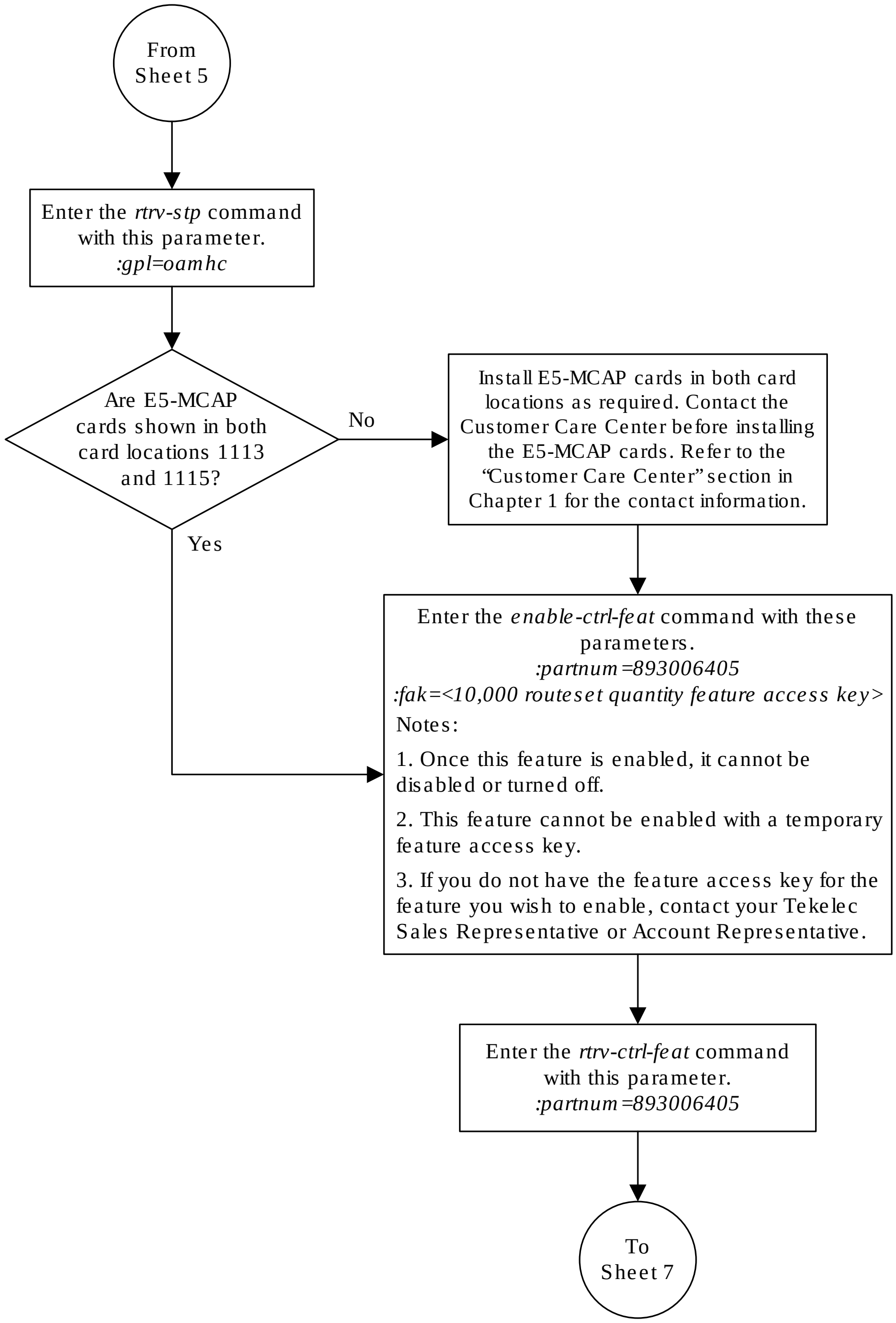
Sheet 3 of 8


From Sheets 1, 2, or 3
What is the current routeset quantity? See the Note.
7000 or 8000
10,000
To Sheet 7
6000 or 5000
Note: If neither 6000, 7000, 8000, nor 10,000 routesets are enabled, the EAGLE 5 ISS can have a maximum of 5000 routesets.
Enter the rtrv-dstn command with this parameter.
:msar=only
Which routeset quantity will be enabled?
6000
7000 or 8000
How many alias point codes are configured?
More than 8000
Perform the "Changing a Destination Point Code" procedure in this chapter and remove the enough alias point codes to reduce the amount of configured alias point codes to less than 8000.
To Sheet 5
10,000
Less than 8000
How many alias point codes are configured?
Less than 10,000
More than 10,000
Perform the "Changing a Destination Point Code" procedure in this chapter and remove the enough alias point codes to reduce the amount of configured alias point codes to less than 10,000.
To Sheet 5

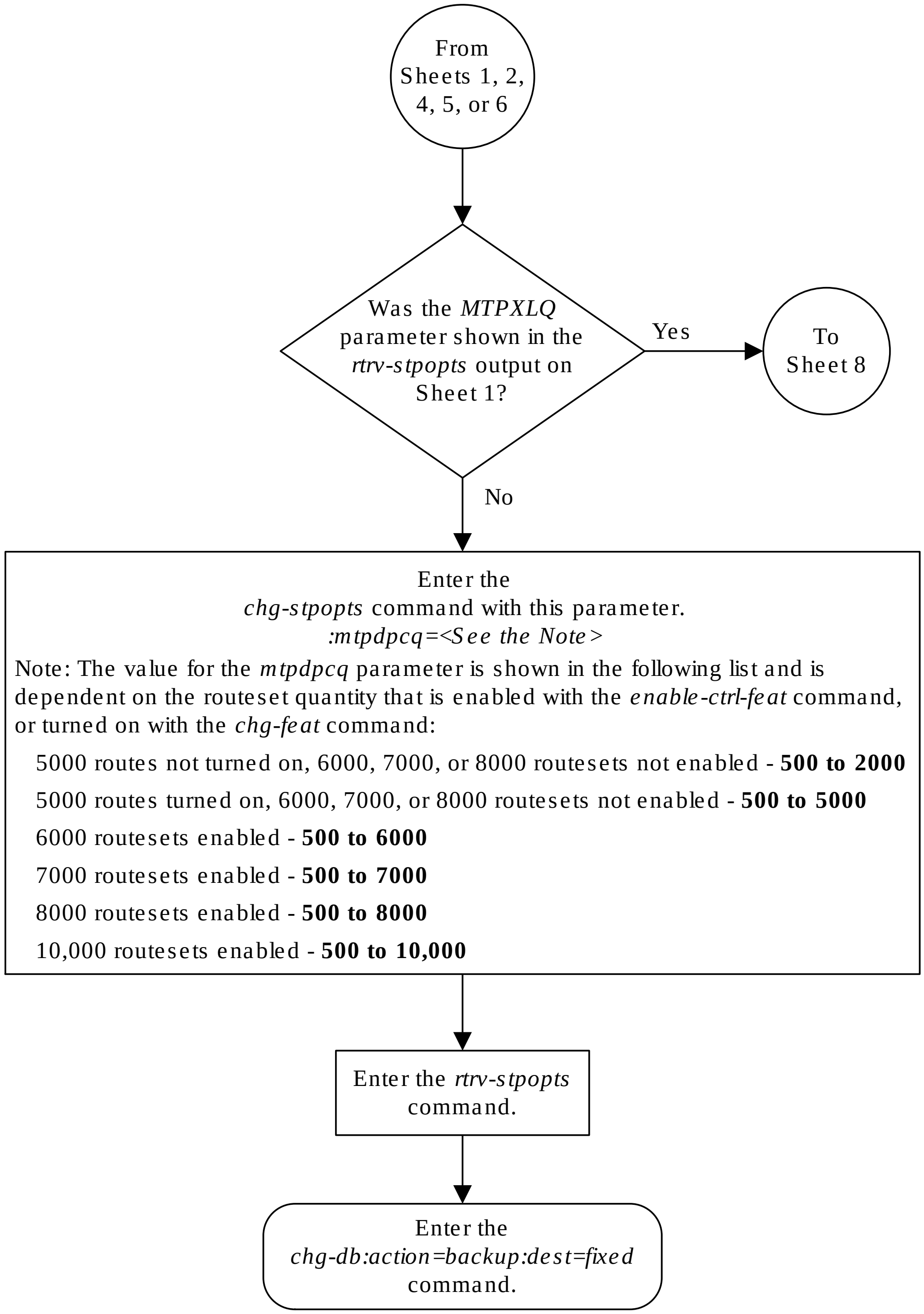
Sheet 4 of 8


From Sheets 1, 3, or 4
Which routeset quantity do you wish to enable?
10,000
To Sheet 6
6000, 7000, or 8000
Enter the enable-ctrl-feat command with these parameters.
To enable the 6000 routeset quantity, specify these parameters.
:partnum=893006401
:fak=<6000 routeset quantity feature access key>
(See Notes 1, 2, and 3)
To enable the 7000 routeset quantity, specify these parameters.
:partnum=893006402
:fak=<7000 routeset quantity feature access key>
(See Notes 1, 2, and 3)
To enable the 8000 routeset quantity, specify these parameters.
:partnum=893006403
:fak=<8000 routeset quantity feature access key>
(See Notes 1, 2, and 3)
Notes:
1. Once this feature is enabled, it cannot be disabled or turned off.
2. This feature cannot be enabled with a temporary feature access key.
3. If you do not have the feature access key for the feature you wish to enable, contact your Tekelec Sales Representative or Account Representative.
Enter the rtrv-ctrl-feat command with this parameter.
:partnum=<part number specified in the enable-ctrl-feat command>
To Sheet 7

Sheet 5 of 8


From Sheet 5
Enter the *rtrv-stp* command with this parameter. *:gpl=oamhc*
Are E5-MCAP cards shown in both card locations 1113 and 1115?
No
Yes
Install E5-MCAP cards in both card locations as required. Contact the Customer Care Center before installing the E5-MCAP cards. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Enter the *enable-ctrl-feat* command with these parameters.
:partnum=893006405
:fak=<10,000 routeset quantity feature access key>
Notes:
1. Once this feature is enabled, it cannot be disabled or turned off.
2. This feature cannot be enabled with a temporary feature access key.
3. If you do not have the feature access key for the feature you wish to enable, contact your Tekelec Sales Representative or Account Representative.
Enter the *rtrv-ctrl-feat* command with this parameter.
:partnum=893006405
To Sheet 7

Sheet 6 of 8


From Sheets 1, 2, 4, 5, or 6
Was the *MTPXLQ* parameter shown in the *rtrv-stpopts* output on Sheet 1?
Yes
To Sheet 8
No
Enter the *chg-stpopts* command with this parameter.
:mtpdpcq=<See the Note>
Note: The value for the *mtpdpcq* parameter is shown in the following list and is dependent on the routeset quantity that is enabled with the *enable-ctrl-feat* command, or turned on with the *chg-feat* command:
5000 routes not turned on, 6000, 7000, or 8000 routesets not enabled - **500 to 2000**
5000 routes turned on, 6000, 7000, or 8000 routesets not enabled - **500 to 5000**
6000 routesets enabled - **500 to 6000**
7000 routesets enabled - **500 to 7000**
8000 routesets enabled - **500 to 8000**
10,000 routesets enabled - **500 to 10,000**
Enter the *rtrv-stpopts* command.
Enter the *chg-db:action=backup:dest=fixed* command.

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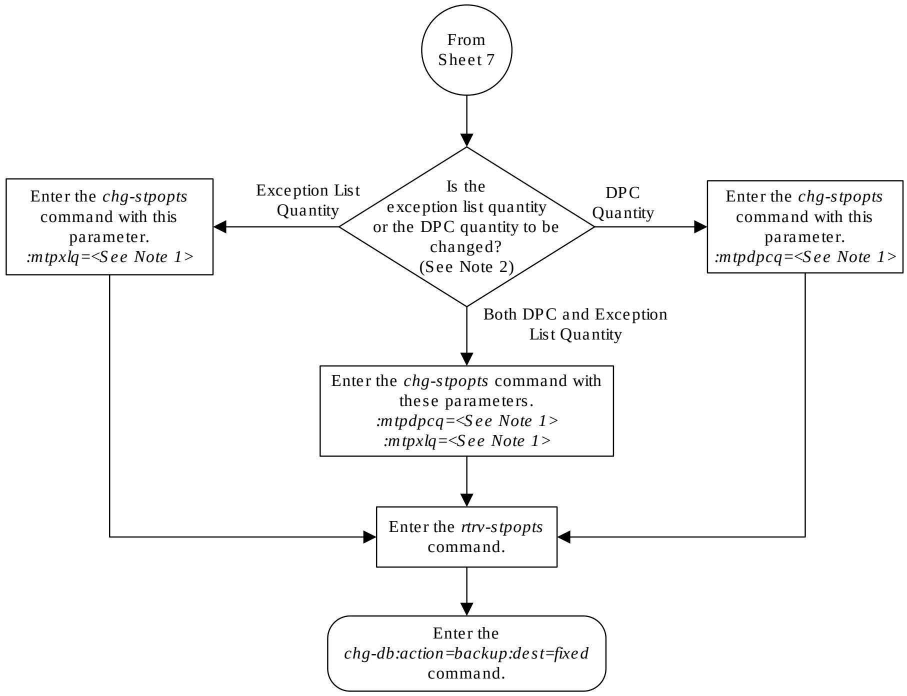

Notes:

1. The sum of the values for the *mtpdpcq* and *mtpxlq* parameters cannot exceed these values, depending which routeset quantity has been enabled with the *enable-ctrl-feat* command, or turned on with the *chg-feat* command:

   5000 routes not turned on, 6000, 7000, 8000, or 10,000 routesets not enabled - **2500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 2000.

   5000 routes turned on, 6000, 7000, 8000, or 10,000 routesets not enabled - **5500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 5000.

   6000 routesets enabled - **6500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 6000.

   7000 routesets enabled - **7500**. The range of values for the *mtpdpcq* parameter is 500 to 7000. The range of values for the *mtpxlq* parameter is 500 to 6000.

   8000 routesets enabled - **8500**. The range of values for the *mtpdpcq* parameter is 500 to 8000. The range of values for the *mtpxlq* parameter is 500 to 6000.

   10,000 routesets enabled – **10,500**. The range of values for the *mtpdpcq* parameter is 500 to 10,000. The range of values for the *mtpxlq* parameter is 500 to 10,000.

2. If the DPC quantity or the exception list quantity is being changed, both the *mtpdpcq* and *mtpxlq* parameters do not have to be specified unless the resulting sum of the *mtpdpcq* and *mtpxlq* parameters would exceed the totals shown in Note 1.

For example, the current *mtpdpcq* value is 4000 and the current *mtpxlq* value is 1500, resulting in a sum of 5500, and only the 5000 Routes feature is on. To increase either value, both parameters must be specified and the sum of the new values cannot exceed 5500. If either value is being decreased, the other parameter can be specified as long as the sum of the values does not exceed 5500.

If in this example, the current *mtpdpcq* value is 3000 and the current *mtpxlq* value is 1500, resulting in a sum of 4500, either parameter value can be changed without specifying the other parameter as long as the sum of the values does not exceed 5500.

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2.8 Activating the ITU National and International Spare Point Code Support Feature

This feature allows **ITU** international (**ITU**-I) and 14-bit **ITU** national (**ITU**-N) spare point codes to be provisioned in the database. To provision these point codes, you must enable the **ITU** National and International **Spare Point Code** Support feature with the `enable-ctrl-feat` command. Turning this feature on with the `chg-ctrl-feat` command allows the **EAGLE** to route messages using **ITU**-I and 14-bit **ITU**-N spare point codes.

The `enable-ctrl-feat` command enables the **ITU** National and International **Spare Point Code** Support feature by inputting the feature's access key and the feature's part number with these parameters:

`:fak` – The feature access key provided by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive.

`:partnum` – The Oracle-issued part number of the **ITU** National and International **Spare Point Code** Support feature, 893013601.

Once this feature is enabled, it is permanently enabled. This feature cannot be enabled with a temporary feature access key.

The `enable-ctrl-feat` command requires that the database contain a valid serial number for the **EAGLE**, and that this serial number is locked. You can verify this with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, with the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, you should enter the `ent-serial-num` command twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the **ITU** National and International **Spare Point Code** Support feature, 893013601.

`:status=on` – used to turn the **ITU** National and International **Spare Point Code** Support on.

The status of the controlled features in the **EAGLE** is shown with the `rtrv-ctrl-feat` command.

Once the **ITU** National and International **Spare Point Code** Support is enabled, **ITU**-I or 14-bit **ITU**-N spare point codes can be added to the **EAGLE**. To do this, perform these procedures to provision these database entities.

- To add spare point codes to the self identification of the **EAGLE** - Adding a Point Code to the Self-Identification of the EAGLE procedure

- To change the self identification of the EAGLE to include spare point codes - Changing the Self-Identification of the EAGLE procedure.
- To add spare point codes to the **DPC** table - Adding a Destination Point Code procedure.
- To use spare point codes as the adjacent point code of a linkset - Adding an SS7 Linkset .
- To add signaling links to the linkset - Adding an SS7 Signaling Link procedure.
- To use spare point codes as the **DPC** of a route - Perform one of the “Adding a **Route**” procedures in SS7 Configuration.

1. Display the controlled features in the database by entering the `rtrv-ctrl-feat` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 11:43:04 GMT EAGLE5 37.0.0
   The following features have been permanently enabled:

   Feature Name                Partnum    Status  Quantity
   SCCP Conversion             893012001  on      ----
   EIR                         893012301  on      ----
   GSM Map Screening (GMS)     893013201  on      ----
   HC-MIM SLK Capacity         893012707  on      64

   The following features have been temporarily enabled:

   Feature Name                Partnum   Status Quantity   Trial Period
   Left
   Zero entries found.

   The following features have expired temporary keys:

   Feature Name                Partnum
   Zero entries found.
   ```

   If the **ITU** National and International **Spare Point Code** Support feature is enabled, the entry `Spare Point Code Support` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the **ITU** National and International **Spare Point Code** Support feature is on, no further action can be performed.

   If the **ITU** National and International **Spare Point Code** Support is enabled but not turned on (shown by the entry `off` in the `Status` column), continue the procedure with 7.

   If the **ITU** National and International **Spare Point Code** Support is not enabled, continue the procedure with 2 .

2. Display the serial number in the database with the `rtrv-serial-num` command.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with 6. If the `rtrv-ctrl-feat` output shows only the **HC-MIMSLK** Capacity feature with a quantity of 64, 2 through 5 must be performed.

This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with 6. If the serial number is correct but not locked, continue the procedure with 5. If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231

   System serial number is not locked.
   ```

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE’s serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Enable the **ITU** National and International **Spare Point Code** Support feature by entering the `enable-ctrl-feat` command.

   For this example, enter this command.

   `enable-ctrl-feat:partnum=893013601:fak=<ITU National and International Spare Point Code Support feature access key>`

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the **ITU** National and International **Spare Point Code** Support feature, contact your Oracle Sales Representative or Account Representative.

   When the `enable-crtl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP A - COMPLTD
```

7. Turn the **ITU** National and International **Spare Point Code** Support feature on by entering the `chg-ctrl-feat` command with the part number used in 6 and the `status=on` parameter.

   > **Caution:**
   >
   > Once the **ITU** National and International **Spare Point Code** Support feature is turned on, it cannot be turned off.

For this example, enter this command.

`chg-ctrl-feat:partnum=893013601:status=on`

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

8. Verify the changes by entering the `rtrv-ctrl-feat`command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
Spare Point Code Support  893013601 on     ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

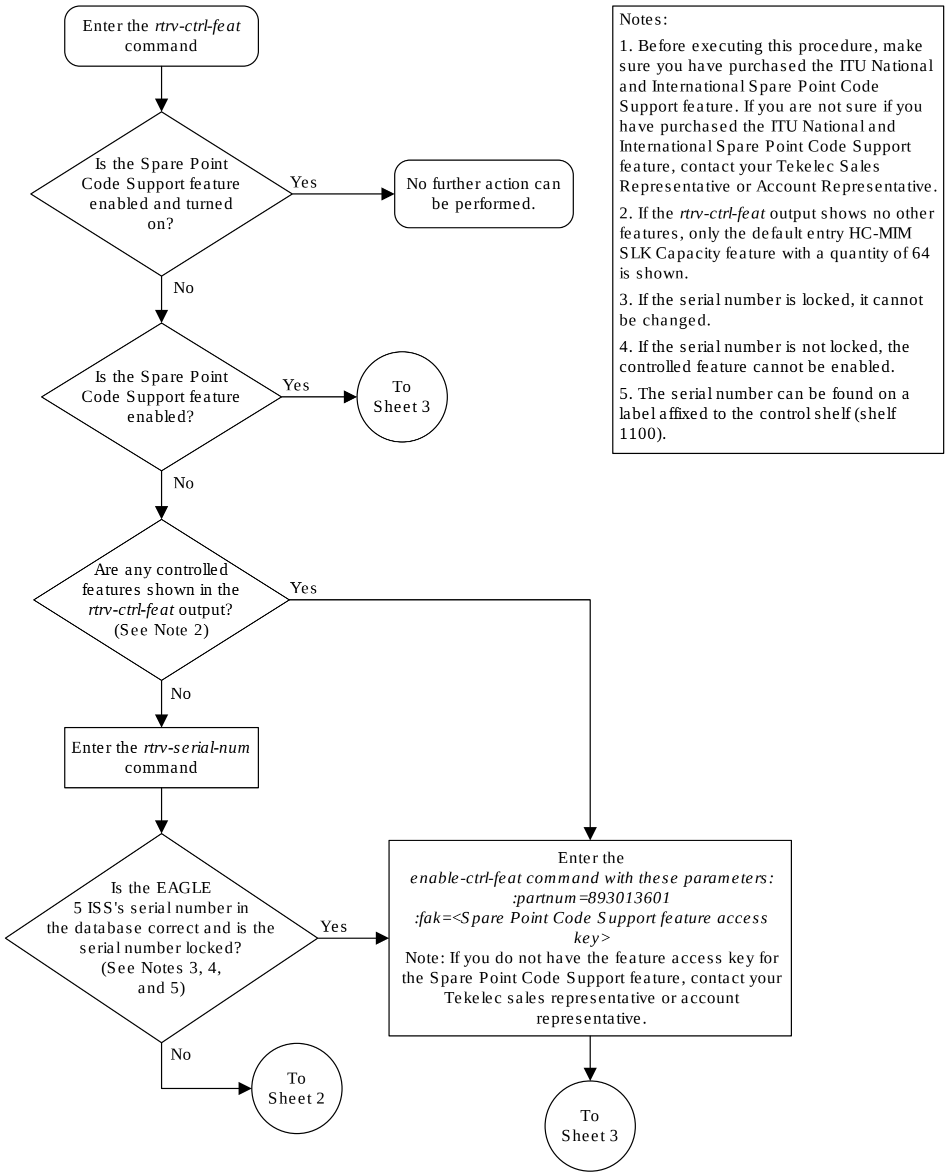
   The following messages should appear. The active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

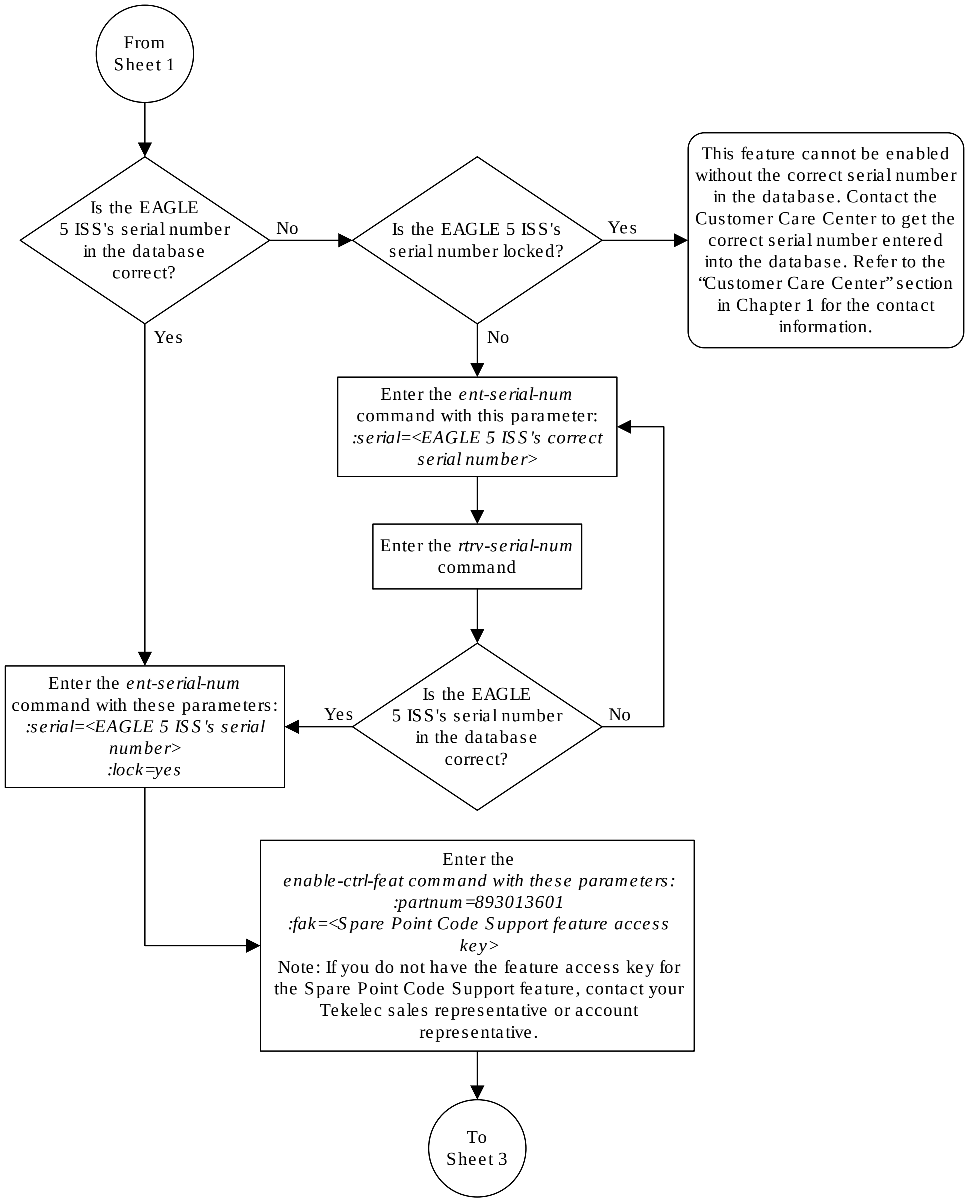
10. To begin adding **ITU**-I or 14-bit **ITU**-N spare point codes, perform the Adding a Point Code to the Self-Identification of the EAGLE procedure.

> **Note:**
>
> Before executing this procedure, make sure you have purchased the ITU National and International Spare Point Code Support feature. If you are not sure if you have purchased the ITU National and International Spare Point Code Support feature, contact your Oracle Sales Representative or Account Representative.

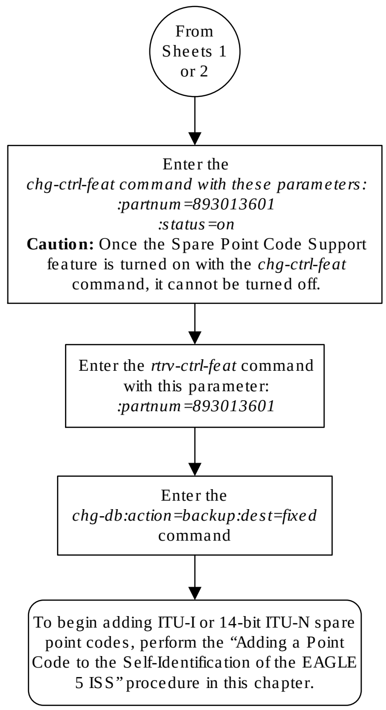
Figure 2-9 Activating the ITU National and International Spare Point Code Support Feature



Sheet 1 of 3


From
Sheet 1
Is the EAGLE 5 ISS's serial number in the database correct?
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Yes
No
Enter the ent-serial-num command with this parameter:
:serial=<EAGLE 5 ISS's correct serial number>
Enter the rtrv-serial-num command
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
No
Enter the ent-serial-num command with these parameters:
:serial=<EAGLE 5 ISS's serial number>
:lock=yes
Enter the enable-ctrl-feat command with these parameters:
:partnum=893013601
:fak=<Spare Point Code Support feature access key>
Note: If you do not have the feature access key for the Spare Point Code Support feature, contact your Tekelec sales representative or account representative.
To
Sheet 3

Sheet 2 of 3



Sheet 3 of 3

2.9 Spare Point Code Feature Migration Plan

This section describes how to migrate a signaling network that uses the Duplicate Point Code feature to support a National Spare network to a signaling network that uses the ITU National and International Spare Point Code Support feature to support a National Spare network

Terminology

The term “enabled” refers to entering the `enable-ctrl-feat` command to provision the ITU National and International Spare Point Code Support feature.

The term “turn on” refers to entering the `chg-ctrl-feat` command to change the ITU National and International Spare Point Code Support feature status to on. After this feature is turned on, all MSU processing is performed using the ITU National and International Spare Point Code Support feature rules.

APC refers to the adjacent point code of a linkset. The APC is the point code of the adjacent node to which messages are routed. The APC can be one of these types of point codes:

- ANSI point code
- ITU-International point code
- ITU-International spare point code
- 14-bit ITU-National point code
- 14-bit ITU-National spare point code
- 24-bit ITU-National point code.

For more information on these point code types, see the Point Code Formats section.

SAPC refers to the secondary adjacent point code that is assigned to a linkset. For more information on secondary adjacent point codes, see the Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC) procedure.

National traffic refers to traffic whose messages contain the national network indicator value 2 (NI=10_{binary}).

National Spare traffic refers to traffic whose messages contain the national spare network indicator value 3 (NI=11_{binary}).

Assumptions

The examples used to illustrate the migration process use these assumptions.

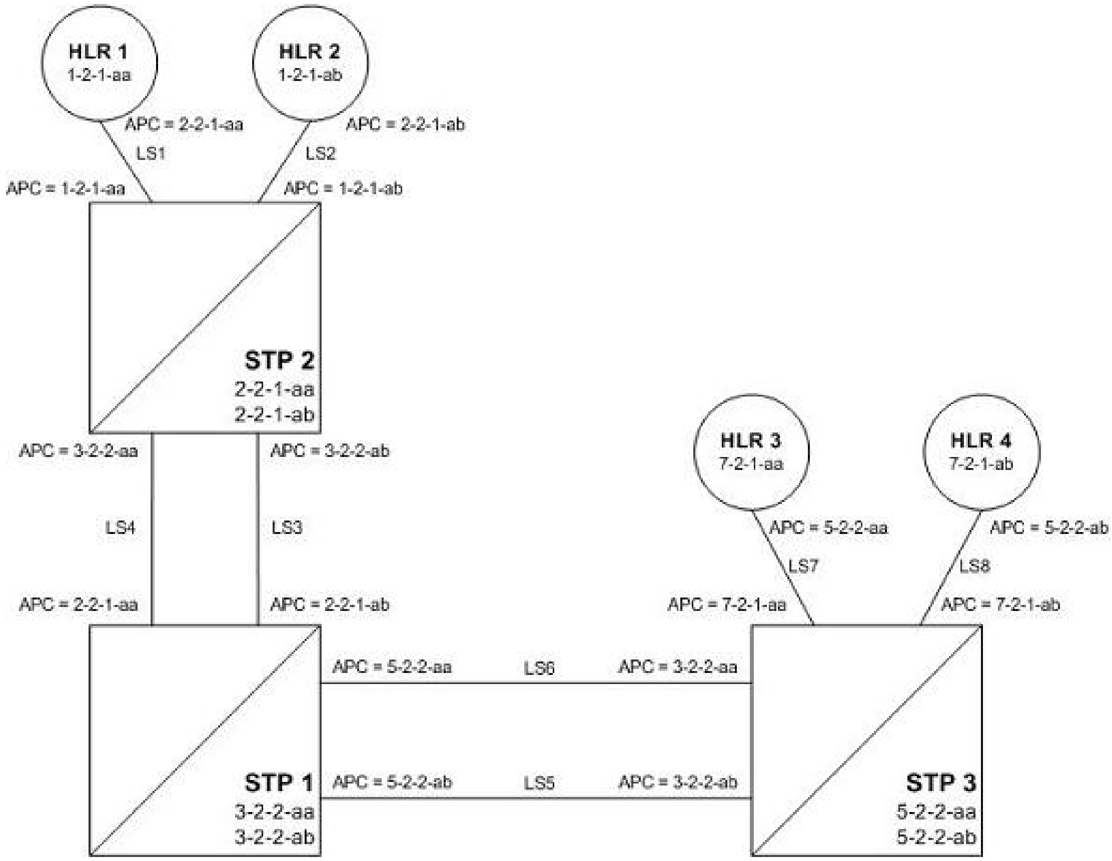
- The group code aa is assigned to the point codes that are assigned to the nodes handling messages that contain the national network indicator value 2 (NI=10_{binary}).
- The group code ab is assigned to the point codes that are assigned to the nodes handling messages that contain the national spare network indicator value 3 (NI=11_{binary}).
- Only two nodes support the duplicate point code feature: STP 1 and STP 2.
- Between pairs of nodes, separate linksets exist for group aa and group ab. In this case, separate linksets exist between STP 1 and STP 2.
- The nodes are migrated to the ITU National and International Spare Point Code Support feature, one at a time, in three stages.
  - Stage one involves upgrading all the nodes to the new software load, enabling the ITU National and International Spare Point Code Support feature for provisioning, and provisioning each node with the required point codes and routes.
  - Stage two involves turning on the ITU National and International Spare Point Code Support feature on an adjacent pair of EAGLEs, one pair of nodes at a time, and changing the routing between these EAGLEs to use a single linkset.

  - Stage three removes the components that are no longer needed after the migration has been completed.
- After the migration process is complete, a single linkset will remain between pairs of nodes. Each linkset will carry both National and National Spare traffic.
- A third linkset containing high-speed signaling links will be created to support both the National and National Spare traffic. The other two linksets will be removed later.
- Prior to merging both National and National Spare traffic for an adjacent pair of nodes onto a single linkset, the customer and Oracle will need to determine whether more links must be added to the linkset to support the higher traffic volume. If the linkset has already reached its limit of 16 links, and more links are required, the customer and Oracle will decide whether the customer must deploy high-speed signaling links.
- The `nis` parameter value for all linksets whose point code suffix is ab is set to `on`.
- After an EAGLE has been upgraded to the ITU National and International Spare Point Code Support feature, the point codes that will bew assigned to these nodes will have to be provisioned with the same group codes that are currently assigned to these nodes.
- The routes for the National Spare traffic must be provisioned before the ITU National and International Spare Point Code Support feature is turned on for a node.
- The customer should not lose any traffic during the migration.

Figure 2-10 shows an example network that is not using the ITU National and International Spare Point Code Support feature.

> **Note:**
>
> For the figures shown in this section, a point code that is prefaced with “s” indicates a spare point code, and a point code that is not prefaced with an “s” indicates a non-spare point code. If a linkset includes an APC (adjacent point code) or SAPC that is prefaced with “s,” the linkset supports traffic to and from ITU-National spare point codes. If the linkset includes an APC or SAPC that is not prefaced with “s,” the linkset supports traffic to and from ITU-National point codes. A linkset that includes both ITU-National and ITU-National spare APC and SAPCs supports both national and national spare traffic. Point codes that are labeled within the STP nodes represent true and secondary EAGLE point codes.

Figure 2-10 Example of an Existing Network that is not using the ITU National and International Spare Point Code Support Feature



Stage One

Figure 2-11 shows an example network. The items shown in bold are items that are added during this stage of the migration procedure.

The following steps are performed for each node shown in Figure 2-11, one at a time, as part of this stage of the migration procedure.

1. Upgrade each EAGLE shown in Figure 2-11 to the software release that contains the ITU National and International Spare Point Code Support feature by performing the appropriate upgrade procedure.
2. Enable the ITU National and International Spare Point Code Support feature on each EAGLE shown in Figure 2-11, by performing the Activating the ITU National and International Spare Point Code Support Feature procedure. Do not turn the feature on at this time.

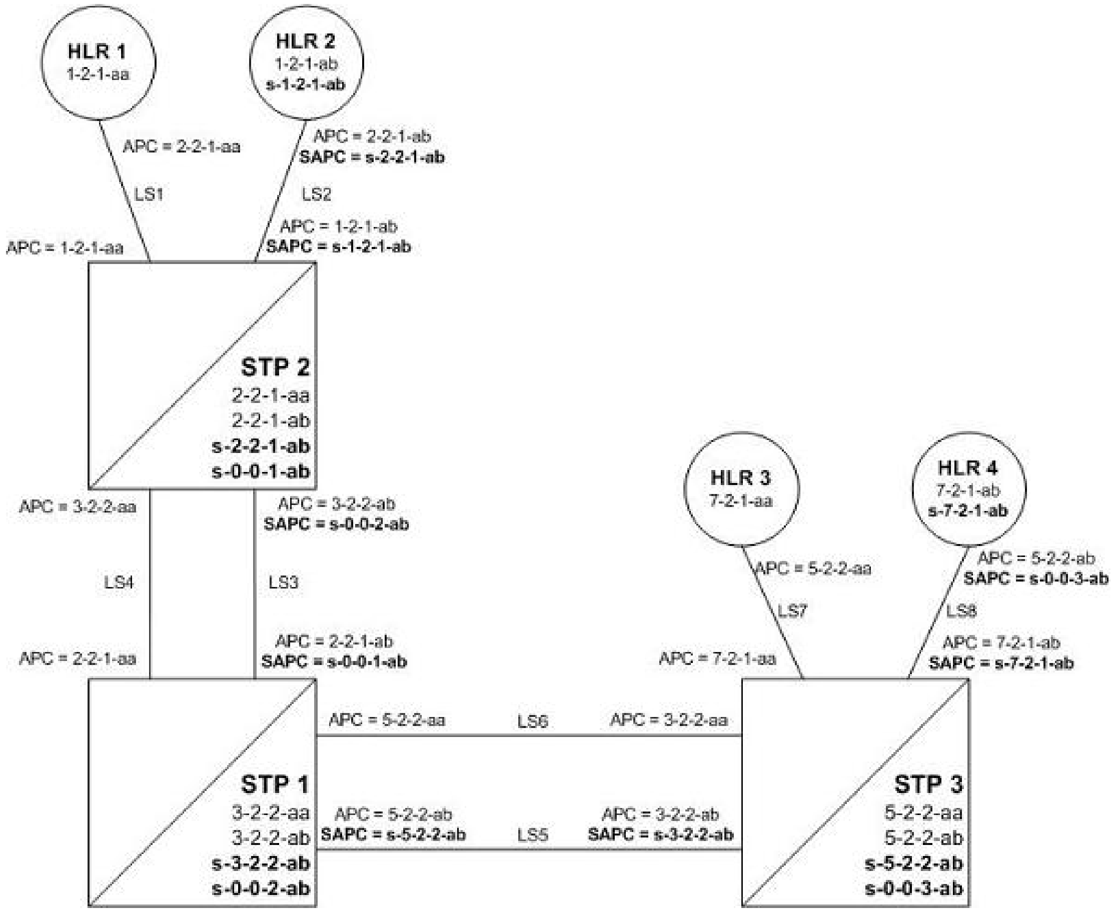
> **Note:**
>
> Provisioning for the ITU National and International Spare Point Code Support feature can be performed once the feature is enabled. Message processing based on this feature is not performed until the feature is turned on.

3. Add a new true ITU-National spare point code in the self identification table of each EAGLE by performing the Adding a Point Code to the Self-Identification of the EAGLE procedure at each EAGLE. For example, add these point codes:
   - Point code s-3-2-2-ab to STP 1
   - Point code s-2-2-1-ab to STP 2
   - Point code s-5-2-2-ab to STP 3.
4. Add one secondary ITU-National spare point code to each EAGLE by performing the Adding a Secondary Point Code procedure. For example, add these point codes:
   - Point code s-0-0-1-ab to STP 2
   - Point code s-0-0-2-ab to STP 1
   - Point code s-0-0-3-ab to STP 3.
5. Add a secondary adjacent ITU-National spare point code (SAPC) to the linksets whose APCs have the “ab” suffix by performing the Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC) procedure. For example, add these secondary adjacent point codes:
   - SAPC s-0-0-1-ab for linkset LS3 in STP 1
   - SAPC s-0-0-2-ab for linkset LS3 in STP 2
   - SAPC s-5-2-2-ab for linkset LS5 in STP 1
   - SAPC s-3-2-2-ab for linkset LS5 in STP 3
   - SAPC s-1-2-1-ab for linkset LS2 in STP 2
   - SAPC s-7-2-1-ab for linkset LS8 in STP 3.

   This provisioning must be done before National Spare traffic can be routed over the linksets whose APCs have the “ab” suffix using the ITU National and International Spare Point Code Support feature. As a result of this provisioning, linksets LS2, LS3, LS5, and LS8 can support traffic to and from ITU-National spare point codes as well as ITU-National point codes.
6. Provision the routes for the ITU-National spare point codes provisioned in step 5 by performing one of these procedures as required.
   - Adding a Route Containing an SS7 DPC
   - Adding a Route Containing an IPGWx Linkset

   For example, provision a route to point code s-1-2-1-ab on LS3 at STP 1.

Figure 2-11 Stage One - ITU National and International Spare Point Code Support Feature Provisioned on All Nodes



After Stage One has been completed, as indicated in Figure 2-11, linksets LS2, LS3, LS5, and LS8 are capable of supporting traffic to and from both ITU-National and ITU-National spare point codes. Routing decisions, however, are still made using the Duplicate Point Code rules, as the ITU National and International Spare Point Code Support feature has not been turned on.

Stage Two

After stage one is completed for all nodes, the network continues to have the same linksets that it had before this process was started. The same messages are routed over the same linksets, except the new feature is used for routing on select adjacent nodes (STP 1 and STP 2 in this example). This is shown in Figure 2-12 when the feature is turned on for STP 1 and STP 2. Items in bold are added during this stage.

1. Turn on MSU processing on STP 1 by turning on the ITU National and International Spare Point Code Support feature. Perform the Activating the ITU National and International Spare Point Code Support Feature procedure on STP 1 to turn the spare point code feature on.
   At this point, messages arriving at STP 1 with the DPC 1-2-1-aa that contain the national spare network indicator value 3 (NI=11_{binary}) are routed using linkset LS3 with the new route provisioned in step 6 of Stage One of this procedure (point code s-1-2-1-ab on LS3 at STP 1).

Messages arriving with DPC 1-2-1-ab that contain the national network indicator value 2 ($NI=10_{binary}$) will continue to be routed using linkset LS4.

Since the ITU National and International Spare Point Code Support feature has not been turned on for STP 2 and STP 3, these nodes continue to route traffic according to the Duplicate Point Code feature rules.

2. Turn on MSU processing on STP 2 by turning on the ITU National and International Spare Point Code Support feature. Perform the Activating the ITU National and International Spare Point Code Support Feature procedure on STP 2 to turn the spare point code feature on.
   At this point, messages arriving at STP 2 with DPC 7-2-1-ab that contain the national spare network indicator value 3 ($NI=11_{binary}$) are routed using linkset LS5 with the new route provisioned in step 6 of Stage One of this procedure (point code s-7-2-1-ab on LS5 at STP 2).

   Messages arriving with DPC 7-2-1-aa that contain the national network indicator value 2 ($NI=10_{binary}$) will continue to be routed using linkset LS6.

3. Set the `nis` parameter value for linkset LS3 to `off` by performing Changing an SS7 Linkset .

4. Create secondary ITU-National point code 2-2-2-aa on STP 2 and secondary ITU-National point code 3-2-3-aa on STP 1 by performing the Adding a Secondary Point Code procedure on STP 1 and STP 2.

5. Create a third linkset, LS9, that contains high-speed signaling links with these APC and SAPC values:

   - The APC for linkset LS9 on STP 2 is 3-2-3-aa
   - The APC for linkset LS9 on STP 1 is 2-2-2-aa
   - The SAPC for linkset LS9 on STP 2 is s-3-2-2-ab
   - The SAPC for linkset LS9 on STP 1 is s-2-2-1-ab.

   Create linkset LS9 by performing one of these procedures as required:

   - Adding an SS7 Linkset
   - "Configuring an IPGWx Linkset" in *Database Administration - IP7 User's Guide*.
   - "Adding an IPSG M2PA Linkset" in *Database Administration - IP7 User's Guide*.
   - "Adding an IPSG M3UA Linkset" in *Database Administration - IP7 User's Guide*.

   The traffic from linksets LS3 and LS4 will be merged onto linkset LS9. Linkset LS9 will be the only linkset that will remain between STP 1 and STP 2 after the migration is complete.

6. Provision linkset LS9 to use high-speed signaling links by performing one of these procedures as requried:

   - Adding an ATM High-Speed Signaling Link
   - "Adding an IPLIMx Signaling Link" procedure in *Database Administration - IP7 User's Guide*
   - "Adding an IPGWx Signaling Link procedure in *Database Administration - IP7 User's Guide*

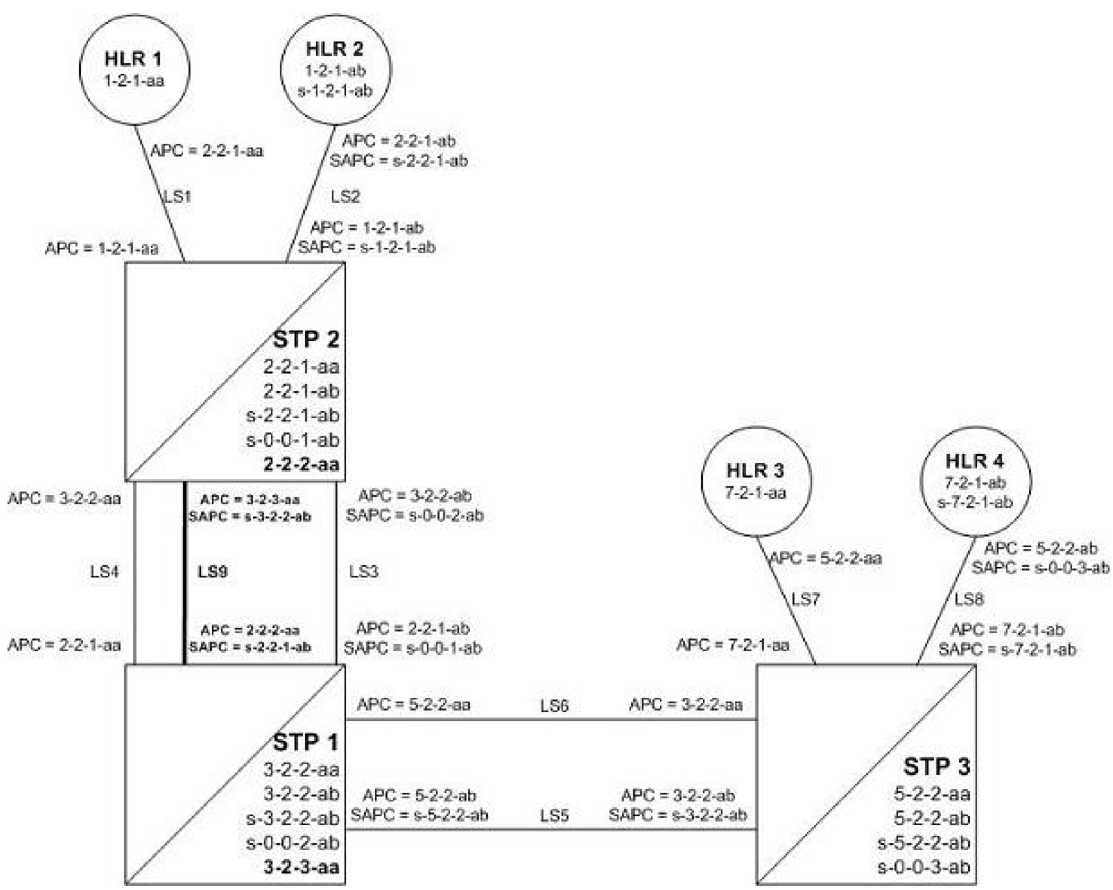
- "Adding an IPSG M2PA Signaling Link" in *Database Administration - IP7 User's Guide*.
- "Adding an IPSG M3UA Signaling Link" in *Database Administration - IP7 User's Guide*.

Make sure that enough slots are available to support these cards.

7. Change the routes on STP 1 to s-1-2-1-ab and 1-2-1-aa so that all National and National Spare traffic uses linkset LS9 by performing the Changing a Route procedure. At this point, incoming National Spare traffic to STP 1 still uses linkset LS3, and incoming National Spare traffic to STP 1 still uses linkset LS4 until the routes on STP 2 are changed so that all National and National Spare traffic uses linkset LS9.
8. Provision routes on the adjacent nodes to include the new true and secondary point codes that were added to STP 1 and STP 2. Perform one of these procedures as required.
    - Adding a Route Containing an SS7 DPC
    - Adding a Route Containing an IPGWx Linkset.

All traffic (National and National Spare) should now be flowing on linkset LS9.

Figure 2-12 Stage Two - All Traffic Merged onto a Third Linkset



In Figure 2-12, all traffic between STP 1 and STP 2 is routed over linkset LS9, using the national spare network indicator value 3 ($NI=11_{binary}$) and the national network indicator value 2 ($NI=10_{binary}$) to select the route. Note that linkset LS3 and linkset LS4 are not being used.

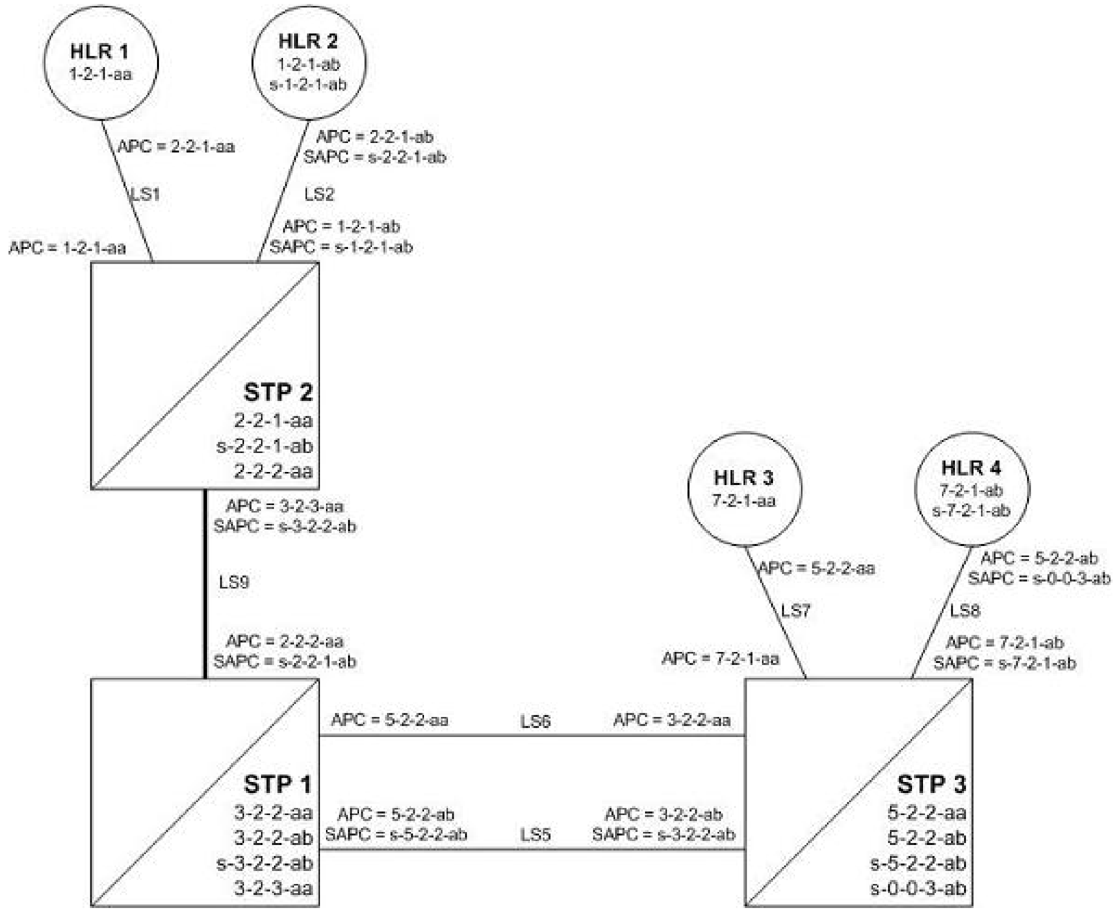
Stage Three - Removing Unused Components

The unused components that resulted from the migration need to be removed.

1. Perform the Removing a Linkset Containing SS7 Signaling Links procedure to remove the unused linksets. For this example, remove linksets LS3 and LS4.
2. Perform the Removing a Destination Point Code procedure to remove the point codes that were the APCs of the unused linksets. For this example, remove point codes 3-2-2-aa and 3-2-2-ab from STP 2, and 2-2-1-aa and 2-2-1-ab from STP 1.
3. Perform the Removing a Secondary Point Code procedure to remove the unused secondary point codes. For this example, remove secondary point codes s-0-0-1-ab from STP 2 and s-0-0-2-ab from STP 1.
4. Perform the Changing the Self-Identification of the EAGLE procedure to remove any unused true point codes. For this example, remove point code 2-2-1-ab from STP 2.

At this point, after all affected linksets have been merged, the situation looks like Figure 2-13. Both National and National Spare traffic between STP 2 and STP 1 are sent over linkset LS9. Traffic between STP 1 and STP 3 continues to route over linkset LS6 for ITU-National point code/group code aa and over linkset LS5 for ITU-National spare point code/group code ab. This is because the ITU National and International Spare Point Code Support feature has been turned on for STP 1 but not for STP 3, so the routes have not been changed between STP 1 and STP 3.

Figure 2-13 Stage Three - All Traffic Merged onto Linkset LS9



2.10 Multiple Point Code Support

Currently, the **EAGLE** supports six true point codes:

- **ANSI** point code
- **ITU** international point code
- **ITU** international spare point code
- 14-bit **ITU** national point code
- 14-bit **ITU** national spare point code
- 24-bit **ITU** national point code.

> **Note:**
>
> The **ITU** national point code can be either 14-bit **ITU** national - spare and non-spare - or 24-bit **ITU** national. Both 14-bit **ITU** national and 24-bit national point codes cannot be present in the **EAGLE** at the same time.

In addition, the **EAGLE** supports up to 96 capability point codes, each of which can be designated as either **ANSI**, **ITU**-I (spare and non-spare), 14-bit **ITU**-N (spare and non-spare), or 24-bit **ITU**-N. Each capability point code defined on an **EAGLE** node can be used for routing messages to that node. For various reasons, customers might need the **EAGLE** to support more than one true point code in a particular domain.

There are three main reasons driving this feature:

- Some customers desire to collapse multiple existing **STP**'s into one **EAGLE**. This can present problems in that end offices and other nodes may not be controlled by the carrier making reprovisioning of these network elements difficult. **Multiple Point Code** (**MPC**) support is designed to allow the **EAGLE** to assume more than one point code for **SS7** routing. **MPC** support is different in concept from capability point codes in that provisioning and routing will use secondary point codes as if they were the actual point code of the **EAGLE**.
- Several customers in the international market want to deploy a single **STP** pair in multiple national (**ITU**-N) networks. This may not be possible without the **MPC** feature, as these operators are often forced to use a unique point code assigned by each national regulator of these target countries.
- Customers may require additional links between two nodes beyond the number of links permitted by the protocol. For example, the maximum number of links between two nodes in an **ITU** network is 16. The **MPC** feature can allow for additional linksets between these nodes, increasing the number of links that can be used.
  This feature adds the ability to support Secondary Point Codes (**SPCs**) in addition to the true point codes used by the **EAGLE** in any of the three domains **ANSI**, **ITU**-N (14-bit or 24-bit) and **ITU**-I. Secondary point codes are used by provisioning and routing as if they are the true point code of the **EAGLE**. **SPCs** are supported for any type of link (A, B, C, D, etc.). There is no effect on provisioning capability point codes as a result of this feature.

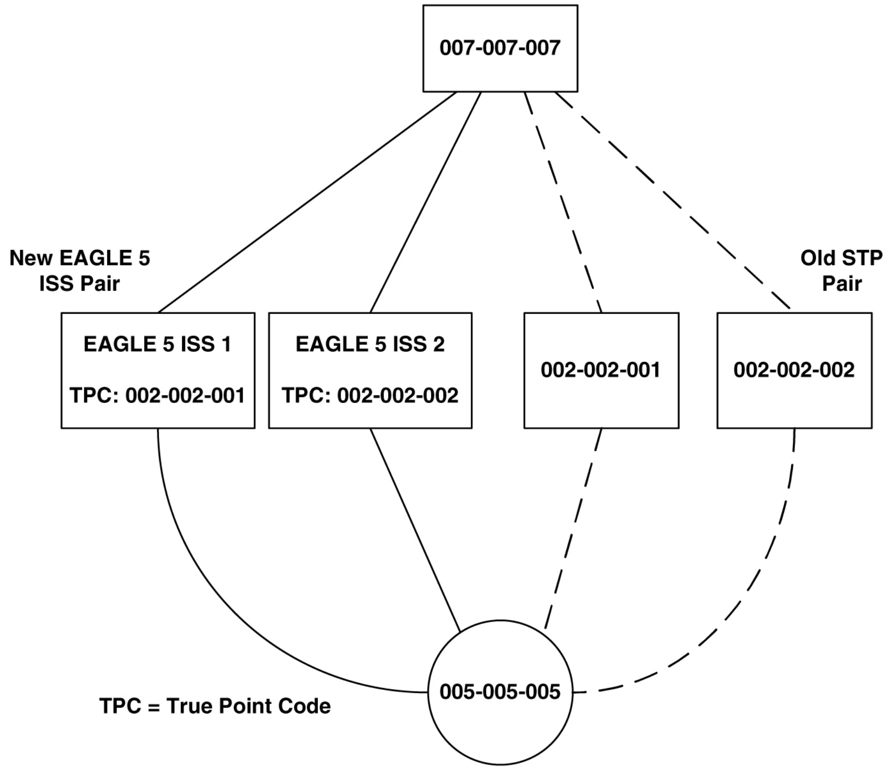
  In addition to the one **True Point Code** (**TPC**) already supported for each of the **ANSI**, **ITU**-N (14-bit or 24-bit) and **ITU**-I domains, the **EAGLE** support a pool of 40 Secondary Point Codes (**SPC**), each of which may be assigned as either **ANSI**, **ITU**-I, 14-bit **ITU**-N, or 24-bit **ITU**-N (not to exceed a total of 40 in one **EAGLE**). **SPCs** can be used in the same ways that true **PCs** are used.

Replacing Two STP Pairs with One Pair

The following example shows how an **EAGLE** pair can replace two existing **STP** pairs. In this example, each **EAGLE** in the pair uses one true point code and one secondary point code.

As shown in Figure 2-14, a new **EAGLE** first replaces one existing **STP** pair. In this case, **EAGLE**'s true point code is set to the true point code of the old **STP**. The adjacent nodes are cut over to the **EAGLE** pair. The adjacent nodes do not need to be reconfigured.

Figure 2-14 Replacing the First STP Pair



Next, a second **STP** pair is replaced with the **EAGLE** pair. As shown in Figure 2-15, an **SSP** and an **STP** are being "re-homed" from an old **STP** pair to a new **EAGLE** pair. In this example, the **STP** (003-003-003) is reconfigured with new routes to recognize that it is now connected to **EAGLE** 1 and **EAGLE** 2 instead of 001-001-001 and 001-001-002. **STP** 003-003-003, if not an **EAGLE** with Multiple Point Codes, may not be able to support more than one linkset to the same point code. See Multiple Linksets between Two Nodes section for a description of this capability. The interconnecting device (**STP** or **SSP**) can use either the **TPC** or **SPC** as the device requires.

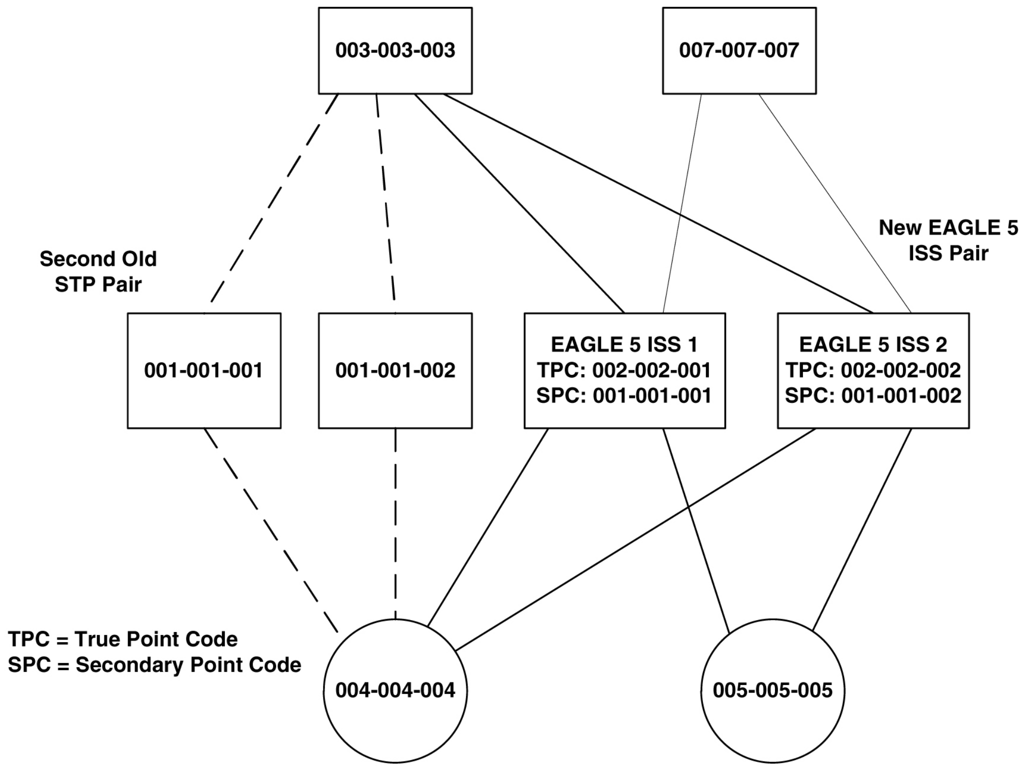
At **EAGLE** 1, the user would configure the secondary point code 001-001-001, using the `ent-spc` command. The user would also configure a route to 001-001-002 over the C-linkset. The user would then configure point code 004-004-004 in the **EAGLE**'s database to indicate that this point code uses the secondary point code 001-001-001, instead of the **EAGLE**'s true point code (`chg-dstn:dpc=004-004-004:spc=001-001-001`. This last step would be repeated for all other adjacent **SSPs** and **SCPs** that are re-homed from the old **STP** Pair to the new **EAGLE** Pair.

Similarly, at **EAGLE** 2, the user would configure the secondary point code 001-001-002, and configure a route over the C-link to 001-001-001. The user would also configure point code 004-004-004 in **EAGLE** 2's database to indicate that this point code uses the secondary point code 001-001-002, instead of the **EAGLE**'s true point code.

When **EAGLE** 1 receives a message from the **SSP** destined for 001-001-001, the **EAGLE** 5 **ISS** processes the message as if the message was sent to the **EAGLE**'s true point code.

When **EAGLE** 1 generates a message (for example, network management, link test messages, or **GTT** messages) that is destined for 004-004-004, **EAGLE** 1 puts the **OPC** 001-001-001 in the message. When **EAGLE** 5 **ISS** 1 generates a message that is destined for 003-003-003 or 005-005-005, it puts the **OPC** 002-002-001 in the message. When **EAGLE** 1 generates **GTT** and **SCMG** messages that are destined for non-adjacent point codes, it includes the **OPC** 002-002-001 in the message.

Figure 2-15 Replacing a Second STP Pair

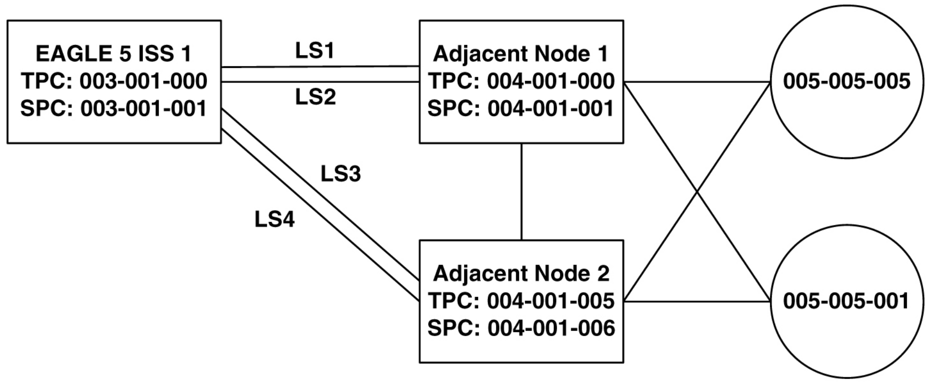


Multiple Linksets between Two Nodes

With this feature, it is possible to configure multiple linksets between two nodes, if the adjacent node also supports Multiple Point Codes. The **EAGLE** continues to enforce the rule that each linkset must have a different adjacent point code.

One reason for provisioning multiple linksets between two nodes is to increase the number of links that can be configured between **STP** pairs. For example, in Figure 2-16, the **EAGLE** is connected to an **STP** pair that supports multiple point codes. Without this feature, only 16 **ITU** links can be configured between the **EAGLE** and the **STP** pair (8 links in **LS1** and 8 links in **LS2**). In this example, two linksets are added, increasing the number of links to 32 (8 links in each of **LS1**, **LS2**, **LS3**, and **LS4**).

Figure 2-16 Multiple Linkset Example



In this example, the adjacent point code (**APC**) for **LS1** is 4-1-0 and the **APC** for **LS2** is 4-1-1. 4-1-1 is assigned an **SPC** of 3-1-1. So adjacent, Adj Node1 sees **LS1** as having an **APC** of 3-1-0, and **LS2** as having an **APC** of 3-1-1.

To load balance over these 4 linksets, half the destinations that use the **STP** pair can be assigned **LS1** and **LS3** as a combined linkset. The other half of the destinations can be assigned **LS2** and **LS4** as a combined linkset.

The commands to provision **EAGLE**1 for the network shown in Figure 2-16 are:

```
chg-sid:pc=3-1-0

ent-spc=3-1-1

ent-dstn:dpc=4-1-0

ent-dstn:dpc=4-1-1:spc=3-1-1

ent-dstn:dpc=4-1-5

ent-dstn:dpc=4-1-6:spc=3-1-1

ent-dstn:dpc=5-5-1

ent-dstn:dpc=5-5-5

ent-ls:lsn=ls1:apc=4-1-0

ent-ls:lsn=ls2:apc=4-1-1

ent-ls: lsn=ls3:apc=4-1-5

ent-ls: lsn=ls4:apc=4-1-6

ent-rte:dpc=4-1-0:lsn=ls1:rc=10

ent-rte:dpc=4-1-1:lsn=ls2:rc=10

ent-rte:dpc=4-1-5:lsn=ls3:rc=10

ent-rte:dpc=4-1-6:lsn=ls4:rc=10

ent-rte:dpc=5-5-1:lsn=ls1:rc=10

ent-rte:dpc=5-5-1:lsn=ls3:rc=10
```

```
ent-rte:dpc=5-5-5:lsn=ls2:rc=10
```

```
ent-rte:dpc=5-5-5:lsn=ls4:rc=10
```

Local Number Portability

> **Note:**
>
> Local number portability supports only **ANSI** point codes.

The **EAGLE** allows only the true point code to be entered into the mated application table. Also, the **EAGLE** continues to allow the user to enter translations to the true point code. However, the **EAGLE** does not allow the user to enter translation to a secondary point code.

If a node sends a `rt-on-gt` query, the node should set the query's **DPC** to the **EAGLE**'s capability point code. If a node sends an `rt-on-ssn` query, the node should set the query's **DPC** to the true point code or secondary point code used by that node. If the node has a secondary point code, then the query's **DPC** is set to the secondary point code. If the node does not have a secondary point code, then the query's **DPC** is set to the true point code.

rt-on-gt Queries from a Node That Uses Secondary Point Codes

Nodes that send `rt-on-gt` queries should use the capability point code, regardless of whether these nodes use a true or a secondary point code.

1. The node sends a query containing this information:
   - The **DPC** is the capability point code of the **EAGLE**'s **LNP** subsystem.
   - The routing indicator in the called party address is **GT**.
   - The point code in the calling party address is the node's point code.
2. The result of the translation contains this information:
   - The **DPC** is the **EAGLE**'s true point code.
   - The routing indicator in the called party address is **SSN**.
   - The subsystem number in the calling party address is the **LNP** subsystem number.
3. The **LNP** subsystem sends a reply with this information:
   - The **DPC** is the calling party address' point code.
   - The **OPC** is the **EAGLE**'s secondary point code.
   - The routing indicator in the called party address is **SSN**.

In this case, if the local subsystem fails or is taken offline, the **EAGLE** sends a response method **TFP** containing this information:

- The **DPC** is the node's point code.
- The **OPC** is the **EAGLE**'s secondary point code.
- The concerned point code is the **EAGLE**'s capability point code.

This **TFP** causes the node to divert traffic to the mate.

If a node sends an `rt-on-gt` query to either the **EAGLE**'s true point code or a secondary point code, the **EAGLE** cannot divert traffic to the mate. In this case, the **EAGLE** does not send a **TFP** concerning the secondary point code or the true point code, so the node will not divert traffic to the mate.

rt-on-ssn queries from a Node That Uses Secondary Point Codes

It is possible that nodes using a secondary point code will send `rt-on-ssn` queries. In this case, these nodes should send the queries to the secondary point code. The **EAGLE** will accept `rt-on-ssn` queries from these nodes if the **DPC** is the true point code or a secondary point code. However, **SCCP** management will not work correctly if the `rt-on-ssn` queries do not use the true point code or a secondary point code associated with the sending node.

1. Nodes send queries to the **EAGLE** with this information:
    - The **DPC** is the **EAGLE**’s secondary point code.
    - The routing indicator in the called party address is **SSN**.
    - The subsystem number in the called party address is the **LNP** subsystem number.
    - The subsystem number is the **LNP** subsystem number.
    - The point code in the calling party address is the node's point code.
2. The **LNP** subsystem sends a reply with this information:
    - The **DPC** is the point code in the calling party address.
    - The **OPC** is the secondary point code.
    - The routing indicator in the called party address is **SSN**.
    - The point code in the calling party address is the secondary point code.

In this case, if the **EAGLE**’s **LNP** subsystem fails or is taken offline, the **EAGLE** broadcasts an **SSP** (assuming that the node is in the concerned point code group) with this information:

- The **DPC** is the node's point code.
- The **OPC** is the secondary point code.
- The affected point code is the secondary point code.
- The affected subsystem number is the **LNP** subsystem number.

Limitations

The same adjacent point code cannot be used for two different links.

Local **EAGLE** subsystems (for example, **LNP**) must use the **True Point Code**.

2.11 Adding a Secondary Point Code

This procedure is used to add a secondary point code to the database using the `ent-spc` command.

The `ent-spc` command uses only one parameter: `spc/spca/spci/spcn/spcn24` – the secondary point code.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the **EAGLE** and for a definition of the different formats that can be used for **ITU** national point codes.

The secondary point code must be a full point code. **Cluster** and network routing point codes cannot be specified as a secondary point code.

The **Multiple Point Code** Support feature must be on to configure secondary point codes in the database. This can be verified with the entry `MPC = on` in the `rtrv-feat` command output. If the **Multiple Point Code** Support feature is not turned on, enter the `chg-feat:mpc=on` command.

> **Note:**
>
> Once the **Multiple Point Code** Support feature is turned on with the `chg-feat` command, it cannot be turned off.
> The **Multiple Point Code** Support feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the **Multiple Point Code** Support feature, contact your Oracle Sales Representative or Account Representative.

The database can contain up to 40 secondary point codes.

The secondary point code cannot be defined in the database as the true point code of the **EAGLE**, a capability point code, a destination point code, or an alias point code. The true point code and capability point codes are shown in the `rtrv-sid` command output. The destination point codes and alias point codes are shown in the `rtrv-dstn` command output.

The secondary point code cannot be shown in the `rtrv-pct` output as an EPC (emulated point code) value.

For the examples in this procedure, these secondary point codes are being added to the database:

ANSI secondary point code = 010-100-010

ITU secondary international point code = 4-100-1

14-bit **ITU** secondary national point code = 14-15-12-1

The format of the 14-bit **ITU** national point codes used in these examples is 4-4-4-2.

Canceling the `RTRV-DSTN` Command

Because the `rtrv-dstn` command used in this procedure can output information for a long period of time, the `rtrv-dstn` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` command can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` command was entered, from another terminal other than the terminal where the `rtrv-dstn` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current secondary point codes, using the `rtrv-spc` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
   SPC (Secondary Point Codes)

   SPCA
        001-010-010
        002-010-010
        003-010-010

   SPC-I
            1-253-5
            2-254-6
            3-255-7

   SPC-N
           10-01-11-1
           13-02-12-0

   SPC-N24

   none

   Secondary Point Code table is (8 of 40) 20% full
   ```

   If the secondary point code table is full, shown by the entry `Secondary Point Code table is (40 of 40) 100% full`, go to the Removing a Secondary Point Code procedure and remove a secondary point code from the database.

   If error message `E3867 Cmd Rej: MPC feature must be enabled` is displayed, the **EAGLE** has detected that the multiple point code support feature is off and the `rtrv-spc` command will not display any data. Continue the procedure with 2 to verify that the multiple point code support feature is off.

2. Verify whether or not the multiple point code support feature is on, by entering the `rtrv-feat` command.

If the multiple point code support feature is on, the `MPC` field should be set to `on`. For this example, the multiple point code support feature is off.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the multiple point code support feature is on, continue the procedure with 4.

If the `rtrv-feat` command output shows that the multiple point code support feature is on, but error message E3867 was displayed when the `rtrv-spc` command was entered, contact the Customer Care Center. Refer to My Oracle Support (MOS) for the contact information.

If group codes are to be assigned to the **ITU**-N secondary point code, and none are currently displayed in the `rtrv-spc` command output, the **ITU** National Duplicate **Point Code** feature must be on. This is shown by the entry `ITUDUPPC = on` in the `rtrv-feat` command output.

3. Turn the multiple point code support feature on by entering this command.

   `chg-feat:mpc=on`

   > **Note:**
   >
   > Once the multiple point code support feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The multiple point code support feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the multiple point code support feature, contact your Oracle Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 00:57:31 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

   > **Note:**
   >
   > If group codes are shown for the 14-bit **ITU**-N secondary point codes in the `rtrv-spc` command output, if 24-bit **ITU**-N secondary point codes are being configured, or the **ITU** National Duplicate **Point Code** feature is on, continue the procedure with 5.

4. Turn the **ITU** National Duplicate **Point Code** feature on by entering this command.

```
chg-feat:ituduppc=on
```

> **Note:**
>
> Once the **ITU** National Duplicate **Point Code** feature is turned on with the `chg-feat` command, it cannot be turned off.
> The **ITU** National Duplicate **Point Code** feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the **ITU** National Duplicate **Point Code** feature, contact your Oracle Sales Representative or Account Representative.

When the `chg-feat` has successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 00:57:31 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

5. Display the self-identification of the **EAGLE** using the `rtrv-sid` command to verify the point code values in the self-identification of the **EAGLE**, and to verify the point code types defined in the **EAGLE**.

   This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT  EAGLE5 37.0.0
   PCA              PCI          PCN                CLLI
PCTYPE
   100-100-100      3-75-7       7-9-8-1            rlghncxa03w       OTHER

   CPCA
   002-002-002       002-002-003       002-002-004       002-002-005
   002-002-006       002-002-007       002-002-008       002-002-009
   004-002-001       004-003-003       050-060-070

   CPCA (LNP)
   005-005-002       005-005-004       005-005-005

   CPCI
   1-002-1           1-002-2           1-002-3           1-002-4
   2-001-1           7-222-7

   CPCN
   2-0-10-3          2-0-11-0          2-0-11-2          2-0-12-1
   2-2-3-3           2-2-4-0           10-14-10-1
```

To enter an **ANSI** secondary code with the `ent-spc` command, a point code must be shown in the `PCA` field of the `rtrv-sid` command output.

To enter an **ITU**-I secondary point code with the `ent-spc` command, a point code must be shown in the `PCI` field of the `rtrv-sid` command output.

To enter a 14-bit **ITU**-N secondary point code with the `ent-spc` command, a point code must be shown in the `PCN` field of the `rtrv-sid` command output.

To enter a 24-bit **ITU**-N secondary point code with the `ent-spc` command, a point code must be shown in the `PCN24` field of the `rtrv-sid` command output.

If the required type of point code is shown in the `rtrv-spc` output in 1 or is shown in the `rtrv-sid` output in this step, continue the procedure with 6.

If the required type of point code is not shown in the `PCA`, `PCI`, `PCN`, or `PCN24` fields of the `rtrv-sid` command output, go to the Adding a Point Code to the Self-Identification of the EAGLE procedure and add the required point codes.

6. Display the current destination point codes using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   030-045-*      rlghncbb010 yes yes ----------
--------------    SS7
   111-011-*      rlghncbb000 yes yes ----------
--------------    SS7
   240-012-004    rlghncbb001 yes ---    1-111-1
10-13-9-3      SS7
   240-012-005    rlghncbb002 yes ---    1-112-2
10-13-10-0     SS7
   240-012-006    rlghncbb003 yes ---    1-112-3
10-13-10-1     SS7
   240-012-008    --------    yes ---    1-113-5
10-13-10-2     SS7

   DPCI           CLLI        BEI ELEI   ALIASA
ALIASN/N24     DMN
   2-131-1        rlghncbb023 no  ---    222-210-000
11-11-8-1      SS7
   2-131-2        --------    no  ---    222-211-001
11-11-8-2      SS7
   2-131-3        --------    no  ---    222-211-002
11-11-8-3      SS7

   DPCN           CLLI        BEI ELEI   ALIASA
ALIASI         DMN
   10-15-2-3      rlghncbb013 no  ---    222-200-200
2-121-1        SS7
   10-15-3-0      rlghncbb013 no  ---    222-200-201
2-121-2        SS7

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                    9
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
```

```
    TOTAL DPC(s):                 11
    CAPACITY (% FULL):            1%
ALIASES ALLOCATED:              8000
    ALIASES USED:                 18
    CAPACITY (% FULL):            1%
X-LIST ENTRIES ALLOCATED:        500
RTRV-DSTN: MASP A - COMPLTD
```

> **Note:**
>
> If the spcn parameter is not being used in this procedure, continue the procedure with 9.

7. Display the PCT entries by entering the `rtrv-pct` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA             FILTPCA          REALPCA      SI  SSN  RELCAUSE
    001-001-001      *                240-012-006   5  ---  10

    ECICS = 10          ECICE = 20
    RCICS = 30          RCICE = 40

    EPCI             FILTPCI          REALPCI      SI  SSN  RELCAUSE
    1-001-2          2-131-2          2-131-3       3   10  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    EPCN             FILTPCN          REALPCN      SI  SSN  RELCAUSE
    13-11-14-1       *                10-15-2-3     *  ---  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------


 Unique EPC    is 3 of 250
 Unique RealPC is 3 of 250

PCT table is (3 of 1000) 1% full.
```

> **Note:**
>
> If the spcn parameter is not being used in this procedure, continue the procedure with 9.

8. Display the existing values for the `npcfmti` parameter by entering the `rtrv-stpopts` command.

The value for the `npcfmti` parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

If you wish to change the format of the 14-bit **ITU** national point codes, go to the 14-Bit ITU National Point Code Formats section. Changing the formats of the 14-bit **ITU** national point codes will change how any existing 14-bit **ITU** national point codes are displayed in the database.

9. Add the secondary point code, using the `ent-spc` command.

   The secondary point code being added in this procedure cannot match any of the point code values shown in the `rtrv-sid` output in 5, and any of the **DPC** or alias point code values shown in the `rtrv-dstn` output in 6.

   The secondary point code being added in this procedure cannot match the EPC (emulated point code) value shown in the `rtrv-pct` output in 7.

   For this example, enter these commands.

   `ent-spc:spca=010-100-010`

   `ent-spc:spci=4-100-1`

   `ent-spc:spcn=14-15-12-1`

   When each of these commands has successfully completed, this is an example of the message that should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
Destination table is (11 of 40) 28% full
ENT-SPC: MASP A - COMPLTD
```

10. Verify the changes using the `rtrv-spc` command.

    This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
SPC (Secondary Point Codes)

SPCA
     001-010-010
```

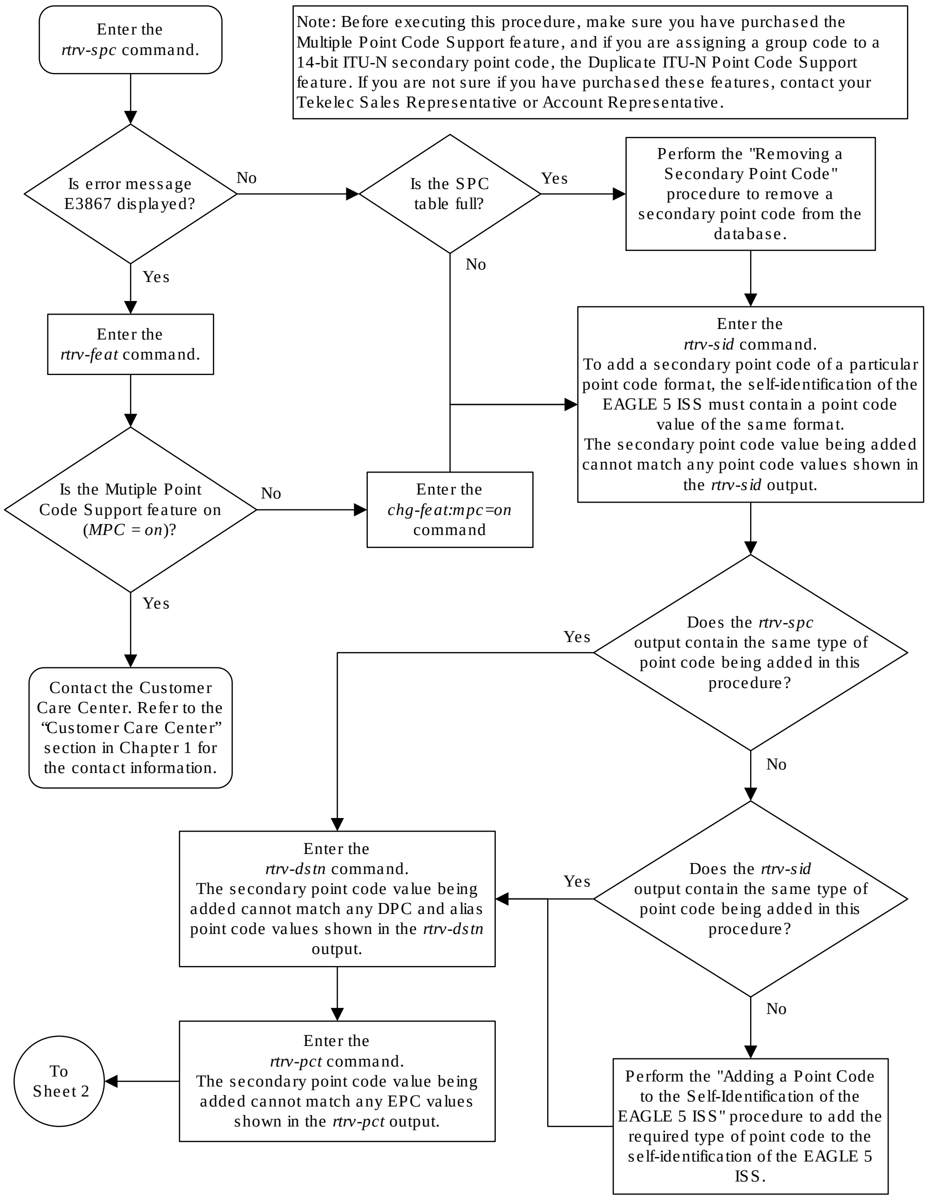
```
     002-010-010
     003-010-010
     010-100-010

SPC-I
         1-253-5
         2-254-6
         3-255-7
         4-100-1

SPC-N
        10-01-11-1
        13-02-12-0
        14-15-12-1

SPC-N24

none

Secondary Point Code table is (11 of 40) 28% full
```

11. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

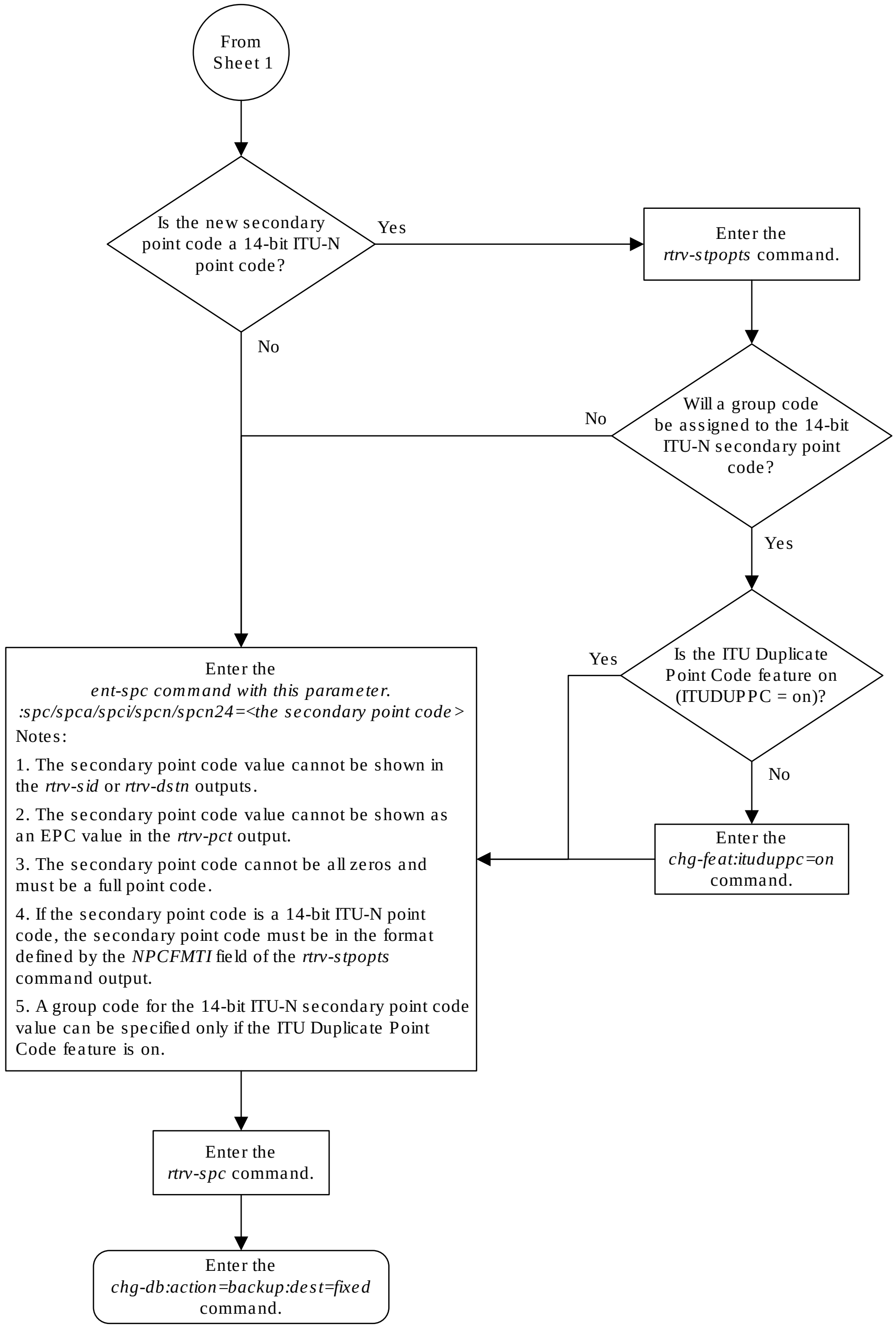
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 2-17 Adding a Secondary Point Code



Sheet 1 of 2



Sheet 2 of 2

2.12 Removing a Secondary Point Code

This procedure is used to remove a secondary point code from the database using the `dlt-spc` command.

The dlt-spc command uses only one parameter: spc/spca/spci/spcn/spcn24 – the secondary point code.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for ITU national point codes.

The secondary point code being removed from the database must be in the database, but cannot be referenced by any destination point codes or by any linksets. Entering the rtrv-dstn command with either the spca, spci, spcn, or spcn24, depending on the point code type of the secondary point code being removed from the database, shows the destination point codes that are referencing the secondary point code being removed from the database.

Entering the rtrv-ls command with either the spca, spci, spcn, or spcn24, depending on the point code type of the secondary point code being removed from the database, shows the linksets that are referencing the secondary point code being removed from the database.

For the example in this procedure, secondary point code 010-100-010 is being removed from the database.

Canceling the RTRV-DSTN Command

Because the rtrv-dstn command used in this procedure can output information for a long period of time, the rtrv-dstn commands can be canceled and the output to the terminal stopped. There are three ways that the rtrv-dstn command can be canceled:

- Press the F9 function key on the keyboard at the terminal where the rtrv-dstn command was entered.
- Enter the canc-cmd without the trm parameter at the terminal where the rtrv-dstn command was entered.
- Enter the canc-cmd:trm=<xx>, where <xx> is the terminal where the rtrv-dstn command was entered, from another terminal other than the terminal where the rtrv-dstn command was entered. To enter the canc-cmd:trm=<xx> command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal’s permissions can be verified with the rtrv-secu-trm command. The user’s permissions can be verified with the rtrv-user or rtrv-secu-user commands.

For more information about the canc-cmd command, refer to *Commands User's Guide*.

1. Display the secondary point codes in the database, using the rtrv-spc command. This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
SPC (Secondary Point Codes)
```

```
SPCA
     001-010-010
     002-010-010
     003-010-010
     010-100-010

SPC-I
         1-253-5
         2-254-6
         3-255-7
         4-100-1

SPC-N
        10-01-11-1
        13-02-12-0
        14-15-12-1

SPC-N24

none

Secondary Point Code table is (11 of 40) 28% full
```

2. Display the destination point codes that reference the secondary point code being removed from the database using the `rtrv-dstn` command with either the `spca`, `spci`, or `spcn` parameters.

   For this example, enter this command.

   `rtrv-dstn:spca=010-100-010`

   This is an example of the possible output.

```
rlghncxa03w 09-05-17 16:02:05 GMT  EAGLE5 41.0.0

SPCA    =    010-100-010

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   240-012-004   rlghncbb001 yes ---    1-111-1         10-13-9-3     SS7

   240-012-005   rlghncbb002 yes ---    1-112-2         10-13-10-0    SS7

Destination table is (16 of 2000) 1% full
Alias table is (9 of 8000) 1% full
RTRV-DSTN: MASP A - COMPLTD
```

   - If no DPCs are shown in this step, skip step 3 and go to step 4.
   - If DPCs are shown in this step, continue the procedure with step 3.

3. Remove the reference to the secondary point code using the `chg-dstn` command and specifying the destination point codes shown in step 2 with either the `dpca`, `dpci`, or `dpcn` parameters, and with either the `spca=none`, `spci=none`, or `spcn=none` parameters, depending on the type of point codes being used. For this example, enter these commands.

```
chg-dstn:dpca=240-012-004:spca=none
```

```
chg-dstn:dpca=240-012-005:spca=none
```

When this command has successfully completed, and the cluster routing and management diversity feature is turned off (`CRMD = off` in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
Destination table is (16 of 2000) 1% full
CHG-DSTN: MASP A - COMPLTD
```

If the cluster routing and management diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), this message should appear when each command has successfully completed.

```
rlghncxa03w 07-5-17 15:35:05 GMT EAGLE5 37.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   14
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  16
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                   8
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
CHG-DSTN: MASP A - COMPLTD
```

After this step has been performed,.skip steps 4 and 5 and go to step 6.

4. Display the status of the Multiple Linksets to Single APC feature by entering this command.

   ```
   rtrv-ctrl-feat:partnum=893019701
   ```

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Multiple Linkset to APC   893019701  on      ----

   The following features have been temporarily enabled:

   Feature Name              Partnum    Status  Quantity     Trial
   Period Left
   Zero entries found.

   The following features have expired temporary keys:
   ```

```
Feature Name                Partnum
Zero entries found.
```

If the Multiple Linksets to Single APC feature is enabled and turned on, continue the procedure with step 5.

If the Multiple Linksets to Single APC feature is not enabled or turned on, skip step 5 and go to step 6.

5. Display the linksets that reference the secondary point code that is being removed by entering the `rtrv-ls` command with the secondary point code value.

   For this example, enter this command.

   `rtrv-ls:spca=010-100-010`

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0

SPCA   =    010-100-010

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn1          002-002-002    none 1   1   no  A   2    off off off no
off
lsn2          003-003-003    none 1   1   no  A   3    off off off no
off


Link set table is (12 of 1024) 1% full.
```

   If linksets are shown in this step, these linksets must be removed before the secondary point code can be removed. Perform the Removing a Linkset Containing SS7 Signaling Links procedure to remove the linksets. After the linksets have been removed, continue the procedure with step 6.

   If no linksets are shown in this step, continue the procedure with step 6.

6. Remove the secondary point code, using the `dlt-spc` command. For this example, enter this command.

   `dlt-spc:spca=010-100-010`

   When this command has successfully completed, this is an example of the message that should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
Destination table is (10 of 40) 25% full
DLT-SPC: MASP A - COMPLTD
```

7. Verify the changes using the `rtrv-spc` command specifying the secondary point code specified in step 6.

   For this example, enter this command.

   rtrv-spc:spca=010-100-010

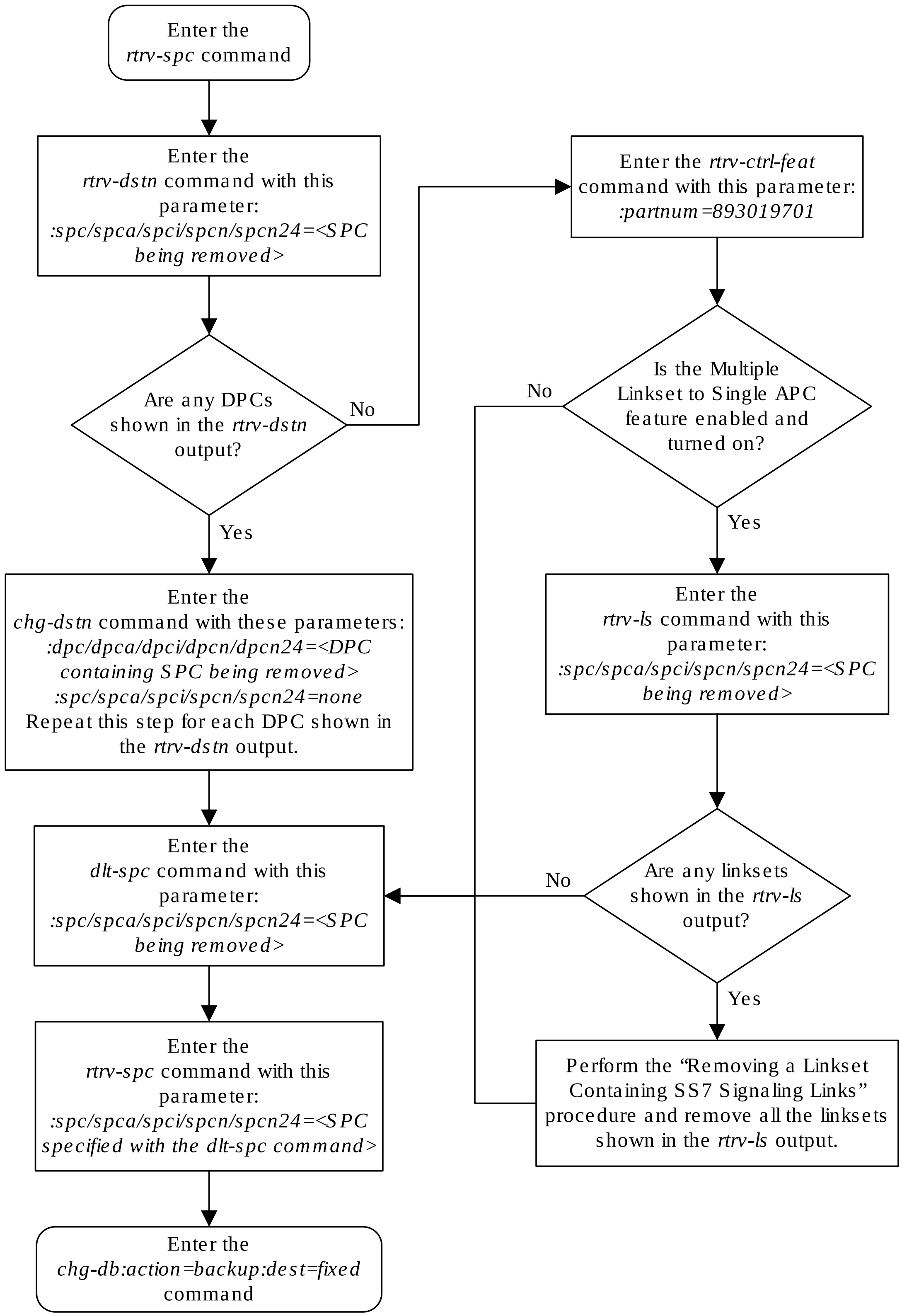
When this command has successfully completed, this is an example of the message that should appear.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
SPC (Secondary Point Codes)

Secondary Point Code specified is not provisioned

Secondary Point Code table is (10 of 40) 25% full
```

8. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command. These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 2-18 Removing a Secondary Point Code



2.13 Adding a Point Code to the Self-Identification of the EAGLE

This procedure is used to add a true point code to the self-identification of the **EAGLE** using the `ent-sid` command. Adding the point code using this procedure instead of the Changing the Self-Identification of the EAGLE procedure does not require the EAGLE to be re-initialized after the point code is added.

However, if you wish to add a capability point code, change an existing true point code, change the **CLLI** value, or the `pctype` parameter value in the self-identification, the Changing the Self-Identification of the EAGLE procedure must be used.

The `ent-sid` command uses these parameters:

`:pc/pca` – **ANSI** point code

`:pci` – **ITU**-I or **ITU**-I spare point code

`:pcn` – 14-bit **ITU**-N or 14-bit **ITU**-N spare point code

`:pcn24` – 24-bit **ITU**-N point code

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the **EAGLE** and for a definition of the different formats that can be used for **ITU** national point codes.

The network type of the point code being added in this procedure cannot be the same as the network type of any point codes shown in `PCA`, `PCI`, `PCN`, or `PCN24` columns in the `rtrv-sid` output. For example, if an **ANSI** point code is shown in the `rtrv-sid` output (a point code in the `PCA` column), then the `pc`/`pca` parameter cannot be specified in this procedure.

However, the self-identification can contain both spare and non-spare point codes for the `PCI` and `PCN` values. If the `rtrv-sid` output contains an **ITU**-I point code, but does not contain an **ITU**-I spare point code, the `pci` parameter can be specified with an **ITU**-I spare point code value. If spare and non-spare point codes are shown for the `PCI` value, then the `pci` parameter cannot be specified in this procedure. This is also true for 14-bit **ITU**-N and 14-bit **ITU**-N spare point codes.

The point code of the **EAGLE** cannot match the capability point codes of the **EAGLE** or any destination point codes or alias point codes. Capability point code are shown in the `rtrv-sid` output. Destination point codes and alias point codes are shown in the `rtrv-dstn` output.

The point code of the **EAGLE** must be a full point code and cannot be a cluster point code. The point code containing all zeros cannot be used as a value for these parameters.

The point code value for the `pcn` parameter (either 14-bit **ITU**-N or 14-bit **ITU**-N spare point code) must match the format defined by the `NPCFMTI` parameter of the `rtrv-`

`stpopts` output. If group codes are shown for the 14-bit **ITU**-N point codes in the `rtrv-sid` output, then a group code must be specified with the `pcn` parameter value. The group code must match the group codes shown in the `rtrv-sid` or `rtrv-spc` outputs.

1. Display the self-identification of the **EAGLE** using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT  EAGLE5 37.0.0
   PCA              PCI          PCN               CLLI
PCTYPE
   001-001-001      1-200-6      10-13-9-3         rlghncxa03w       OTHER

   CPCA
   002-002-002       002-002-003       002-002-004      002-002-005
   002-002-006       002-002-007       002-002-008      002-002-009
   004-002-001       004-003-003       050-060-070
   CPCA (LNP)
   005-005-002       005-005-004       005-005-005

   CPCI
   1-002-1           1-002-2           1-002-3          1-002-4
   2-001-1           7-222-7

   CPCN
   2-0-10-3          2-0-11-0          2-0-11-2         2-0-12-1
   2-2-3-3           2-2-4-0           10-14-10-1
```

   If the network type of the point code being added in this procedure matches the network types of the point codes shown in the `PCA`, `PCI`, `PCN`, or `PCN24` columns, this procedure cannot be performed. Perform the Changing the Self-Identification of the EAGLE procedure to change the point codes shown in these columns.

   > **Note:**
   >
   > If an **ITU**-I or 14-bit **ITU**-N spare point code is displayed in the `rtrv-sid` output in step 1, or if an **ITU**-I or 14-bit **ITU**-N spare point code is not being added in this procedure, skip step 2 and go to step 3.

2. Verify whether or not the **ITU** National and International **Spare Point Code** Support feature is enabled by entering the `rtrv-ctrl-feat`command with the part number of this feature.

   Enter this command.

   `rtrv-ctrl-feat:partnum=893013601`

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status Quantity
```

```
Spare Point Code Support  893013601 on     ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the **ITU** National and International **Spare Point Code** Support feature is not enabled, perform the Activating the ITU National and International Spare Point Code Support Feature procedure to enable the **ITU** National and International **Spare Point Code** Support feature.

> **Note:**
>
> If the `pcn` parameter is not being used in this procedure, skip this step and step 4, and go to step 5.

3. Display the existing values for the `npcfmti` parameter, by entering the `rtrv-stpopts` command.

   The value for the `npcfmti` parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

> **Note:**
>
> If the `rtrv-sid` output in step 1 shows group codes assigned to the 14-bit **ITU**-N point codes, then a group code must be assigned to the `pcn` parameter value specified in this procedure. This group code must be shown in either the `rtrv-sid` output or the `rtrv-spc` output. If the group code being assigned to the `pcn` parameter value is shown in the `rtrv-sid` output, skip step 4 and go to step 5.

4. Display the secondary point codes in the database, using the `rtrv-spc` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-07 11:43:04 GMT  EAGLE5 37.0.0
SPC (Secondary Point Codes)

SPCA
     001-010-010
     002-010-010
     003-010-010
     010-100-010

SPC-I
         1-253-5
         2-254-6
         3-255-7
         4-100-1

SPC-N
        10-01-11-1
        13-02-12-0
        14-15-12-1

SPC-N24

none
```

5. Verify whether or not the point code being added in this procedure is a **DPC** value in the **DPC** table by entering the `rtrv-dstn` command and specifying the point code value that is being added in this procedure. For this example, enter these commands.

   `rtrv-dstn:dpci=s-3-75-7`

   `rtrv-dstn:dpcn=s-7-9-8-1`

   When each of these commands have been executed, the following output is displayed showing that the specified point code is not in the **DPC** table.

```
rlghncxa03w 09-05-28 21:16:37 GMT EAGLE5 41.0.0

No destinations meeting the requested criteria were found
```

```
Destination table is (22 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

6. Verify whether or not the point code being added in this procedure is an alias point code in the **DPC** table by entering the `rtrv-dstn` command and specifying the point code value that is being added in this procedure. For this example, enter these commands.

   `rtrv-dstn:aliasi=s-3-75-7`

   `rtrv-dstn:aliasn=s-7-9-8-1`

   When each of these commands have been executed, the following output is displayed showing that the specified point code is not an alias point code in the **DPC** table.

```
rlghncxa03w 09-05-28 21:16:37 GMT EAGLE5 41.0.0

No destinations meeting the requested criteria were found

Destination table is (22 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

   If the point code specified in steps 5 and 6 is shown in the **DPC** table, choose another point code to add to the self-identification and repeat steps 5 and 6.

   If the point code specified in steps 5 and 6 is not shown in the **DPC** table, go to step 7.

7. Add the point code to the self-identification of the **EAGLE** using the `ent-sid` command with the `pca`, `pci`, `pcn`, or `pcn24` parameters and according to these rules.

   - If the `pcn` parameter is specified with the `ent-sid` command, the `pcn24` parameter cannot be specified.
   - If the `pcn24` parameter is specified with the `ent-sid` command, the `pcn` parameter cannot be specified.
   - For `pcn` parameter values, the format of the point code must match the format defined by the `NPCFMTI` parameter of the `rtrv-stpopts` output. If group codes are shown in the `rtrv-sid` output in step 1, a group code must be assigned to the `pcn` parameter value being added in this procedure. This group code must be shown either in the `rtrv-sid` or `rtrv-spc` output.
   - The point code values must be full point codes.
   - The **ITU** National and International **Spare Point Code** Support feature must be enabled to specify an **ITU**-I or 14-bit **ITU**-N spare point code.
   - The point code specified in this procedure cannot be defined as a capability point code.
   - See "ANSI Point Codes" in the Point Code Formats section for information about entering ANSI point codes.

   For this example, enter this command.

   `ent-sid:pci=s-3-75-7:pcn=s-7-9-8-1`

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 09:17:40 GMT  EAGLE5 37.0.0
ENT-SID: MASP A - COMPLTD
```

8. Verify the changes using the `rtrv-sid` command.

   This is an example of the possible output.

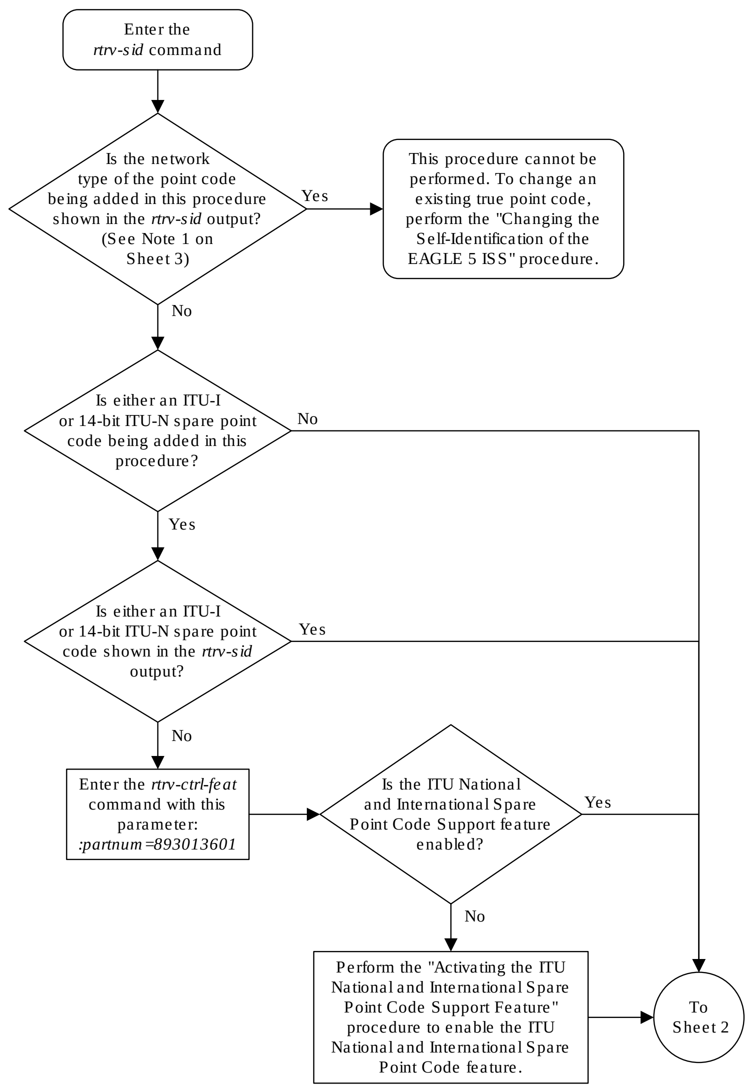
```
rlghncxa03w 07-05-10 11:43:04 GMT  EAGLE5 37.0.0
   PCA              PCI          PCN                 CLLI
PCTYPE
   001-001-001      1-200-6      10-13-9-3           rlghncxa03w       OTHER
                 s-3-75-7     s-7-9-8-1
   CPCA
   002-002-002        002-002-003        002-002-004       002-002-005
   002-002-006        002-002-007        002-002-008       002-002-009
   004-002-001        004-003-003        050-060-070

   CPCA (LNP)
   005-005-002        005-005-004        005-005-005       006-006-006

   CPCI
   1-002-1            1-002-2            1-002-3           1-002-4
   2-001-1            7-222-7

   CPCN
   2-0-10-3           2-0-11-0           2-0-11-2          2-0-12-1
   2-2-3-3            2-2-4-0            10-14-10-1
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

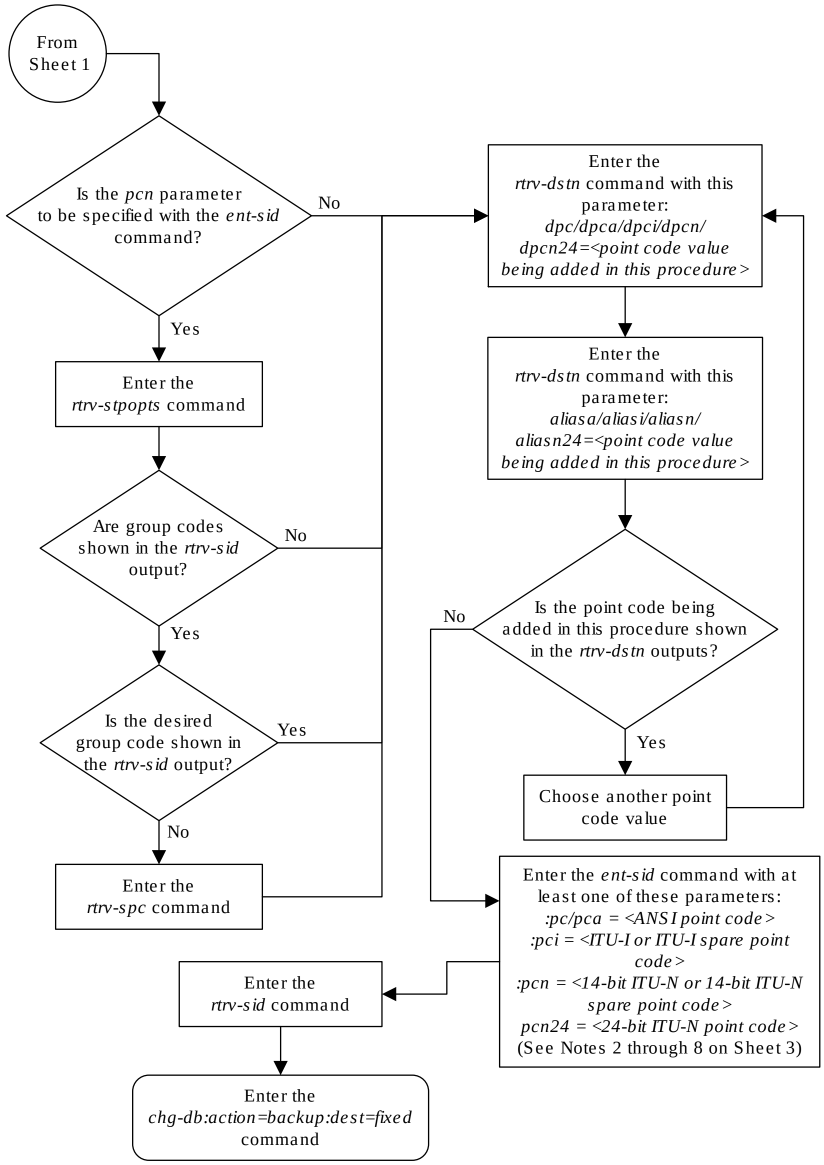
   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 2-19 Adding a Point Code to the Self-Identification of the EAGLE



Sheet 1 of 3


From Sheet 1
Is the pcn parameter to be specified with the ent-sid command?
No
Yes
Enter the rtrv-stpopts command
Are group codes shown in the rtrv-sid output?
No
Yes
Is the desired group code shown in the rtrv-sid output?
Yes
No
Enter the rtrv-spc command
Enter the rtrv-dstn command with this parameter: dpc/dpca/dpci/dpcn/ dpcn24=<point code value being added in this procedure>
Enter the rtrv-dstn command with this parameter: aliasa/aliasi/aliasn/ aliasn24=<point code value being added in this procedure>
Is the point code being added in this procedure shown in the rtrv-dstn outputs?
No
Yes
Choose another point code value
Enter the ent-sid command with at least one of these parameters:
:pc/pca = <ANSI point code>
:pci = <ITU-I or ITU-I spare point code>
:pcn = <14-bit ITU-N or 14-bit ITU-N spare point code>
pcn24 = <24-bit ITU-N point code>
(See Notes 2 through 8 on Sheet 3)
Enter the rtrv-sid command
Enter the chg-db:action=backup:dest=fixed command

Sheet 2 of 3

Notes:

1. The self-identification can contain these types of point codes:

   ANSI - shown in the *PCA* column

   ITU-I - shown in the *PCI* column

   14-bit ITU-N - shown in the *PCN* column

   24-bit ITU-N - shown in the *PCN24* column.

   The *PCI* column can also contain an ITU-I spare point code in addition to the ITU-I point code.

   The *PCN* column can also contain a 14-bit ITU-N spare point code in addition to the ITU-N point code.

   If any of these point code types, including spare point codes, are shown in the rtrv-sid output, then that type of point code cannot be specified in this procedure.

2. If the the *pcn* parameter is specified with the *ent-sid* command, the *pcn24* parameter cannot be specified.

3. If the the *pcn24* parameter is specified with the *ent-sid* command, the *pcn* parameter cannot be specified.

4. For 14-bit ITU-N point code values, the format of the point code must match the format defined by the *NPCFMTI* parameter of the *rtrv-stpopts* output.

5. The point code values must be full point codes.

6. The ITU National and International Spare Point Code Support feature must be enabled to specify an ITU-I or 14-bit ITU-N spare point code.

7. The point code specified in this procedure cannot be defined as a capability point code.

8. See the "ANSI Point Codes" section in the *Database Administration Manual – SS7* for information about entering ANSI point codes.

Sheet 3 of 3

2.14 Changing the Self-Identification of the EAGLE

This procedure is used to change the self-identification of the **EAGLE** using the `chg-sid` command. The self-identification of the **EAGLE** is a set of point codes made up of a true point code (PC) and a capability point code (CPC) for each network type to which the **EAGLE** is connected. A capability point code identifies a group of nodes that have similar capabilities, for example, global title translation.

Caution:

Use this procedure only during periods of low traffic. If the EAGLE's point code, defined by the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter, is changed with the procedure, the EAGLE must be reinitialized with the `init-sys` command. The `init-sys` command reboots the entire EAGLE and reloads all cards with the updated self-identification information.
The`rstrdev` value of the`chg-stpopts` command can be used to turn on the Persistent Device States (PDS) feature. If **PDS** is on, the current device states for cards, signaling links, and terminals are restored after the `init-sys` command has executed. Refer to the `chg-stpopts` command description in *Commands User's Guide* for more information about PDS.

Note:

If the `PCA`, `PCI`, `PCN`, or `PCN24` fields in the `rtrv-sid` output do not contain any values, and you only wish to add these values, it is recommended that the "Adding a Point Code to the Self-Identification of the EAGLE" procedure procedure be used to add these values instead of using this procedure as the "Adding a Point Code to the Self-Identification of the EAGLE" procedure does not require the **EAGLE** to be re-initialized after the point code value is added.

The `chg-sid` command uses these parameters:

`:pc/pca/pci/pcn/pcn24` – The point code used to uniquely identify the **EAGLE** or, with the value `none`, the point code is defined by the `pc/pca/pcn24` parameter is removed from the database. Removing the `pci` or `pcn` value should be done by using the `npci` or `npcn` parameters.

`:cpc/cpca/cpci/cpcn/cpcn24` – The point code used to identify a group of functionally related nodes in the signaling network to which the **EAGLE** belongs. This point code is called the capability point code.

`:ncpc/ncpca/ncpci/ncpcn/ncpcn24` – The new capability point code that replaces an existing capability point code in the database or, with the value `none`, removes an existing capability point code from the database.

`:npci/npcn` – The new ITU-I (`npci`) or 14-bit **ITU**-N (`npcn`) point code used to uniquely identify the **EAGLE** that replaces an existing `pci` or `pcn` parameter value, with the value `none`, removes an existing `pci` or `pcn` parameter value from the database. The `npci/npcn` parameter values cannot be equal to any `cpc` or `pc` parameter values. The `pci` parameter must be specified if the `npci` parameter is specified. The `pcn` parameter must be specified if the `npcn` parameter is specified. The new **ITU**-I or 14-bit **ITU**-N point code values (`npci/npcn`) must be the same type as the `pci/pcn` parameter value. For example, if the `pci` value is a non-spare point code, the `npci` value must be a non-spare point code. If the `pci` value is a spare point code, the `npci` value must be a spare point code.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the **EAGLE** and for a definition of the different formats that can be used for **ITU** national point codes.

`:clli` – The **Common Language Location Identifier** assigned to the **EAGLE**

`:pctype` – Point code type, either `ansi` or `other`.

`:cpctype` – the type of capability point code: STP, LNP, INP, EIR, GPORT, GFLEX, MNP, VFLEX, ATINPQ, AIQ.

The self-identification of the **EAGLE** can consist of an **ANSI** point code, an **ITU** international non-spare point code, an **ITU** international spare point code, a 14-bit **ITU** national non-spare point code, a 14-bit **ITU** national spare point code, or a 24-bit **ITU** national point code, or combinations of these types of point codes. The self-identification of the **EAGLE** cannot have both a 14-bit **ITU**-N point code (spare or non-spare) and a 24-bit **ITU**-N point code.

The self-identification of the **EAGLE** must contain point codes whose formats match the network the **EAGLE** is connected to. For example, if the **EAGLE** is connected to an **ANSI** network, the self-identification of the **EAGLE** must contain an **ANSI** point code. If the **EAGLE** is connected to an **ITU** international network, the self-identification of the **EAGLE** must contain an **ITU** international point code. If the **EAGLE** is connected to an **ITU** national network, the self-identification of the **EAGLE** must contain either a 14-bit or a 24-bit **ITU** national point code.

The self-identification of the **EAGLE** can contain capability point codes. A capability point code is used by the **SS7** protocol to identify a group of functionally related nodes in the signaling network. The self-identification of the **EAGLE** can contain up to 96 capability point codes which can be all one point code network type, or a mixture of all three point code network types.

The **EAGLE** can contain an **ANSI** capability point code, an **ITU** national capability point code (spare or non-spare), and either a 14-bit (spare or non-spare) or a 24-bit **ITU**-N capability point code.

> **Note:**
>
> The self-identification of the **EAGLE** cannot contain private point codes, and private point codes cannot be assigned as capability point codes.

ITU international and 14-bit **ITU** national spare point codes can be specified only if the **ITU** National and International **Spare Point Code** Support feature is enabled. The status of this feature can be verified by entering the `rtrv-ctrl-feat` command. If the **ITU** National and International **Spare Point Code** Support feature is not enabled, perform the Activating the ITU National and International Spare Point Code Support Feature to enable the **ITU** National and International **Spare Point Code** Support feature.

The self-identification of the **EAGLE** can also contain a **CLLI**, the common language location identifier of the **EAGLE**.

The **CLLI** of the **EAGLE** cannot match the **CLLI** of any destination point code. Use the `rtrv-dstn` command to verify the **CLLIs** of the destination point codes in the database.

If the CLLI of the Eagle is changed and the SEAS over IP feature is enabled and turned on, the **CCSMR** configuration must be updated with the new CLLI. Perform the procedures in the "SEAS over IP Configuration Procedures" chapter in the *Database Administration - System Management User's Guide* to update the CCSMR configuration.

If the **CLLI** of the **EAGLE** is to be changed, and the Eagle Support for **Integrated Sentinel** (**E5IS**) feature is on, the **EISCOPY** option must be off before the `chg-sid` command is executed. The value of the **EISCOPY** option can be verified with the `rtrv-eisopts` command. After the `chg-sid` command is executed, the **EISCOPY** option must be changed back to on.

> **Note:**
>
> For the complete list of cards supported by EAGLE Release 47.0, see Hardware Reference Guide.

Capability point codes are specified with the `cpctype` parameter with the capability point code parameters, `cpc/cpca/cpci/cpcn/cpcn24`, or the new capability point code parameters, `ncpc/ncpca/ncpci/ncpcn/ncpcn24`. The EAGLE supports these types of capability point codes.

- STP capability point codes are specified with the `cpctype=stp` parameter. **STP** capability point codes can be any point code type. **STP** capability point codes can be specified regardless of which features are enabled or turned on.
- LNP capability point codes are specified with the `cpctype=lnp` parameter. LNP capability point codes can be only ANSI point codes, specified with either the `cpc`, `cpca`,`ncpc`, or `ncpca` parameters. The LNP feature must be enabled to specify the `cpctype=lnp` parameter. This can be verified with the `rtrv-ctrl-feat` command. If the LNP feature is enabled, the entry `LNP TNs` is shown in the `rtrv-ctrl-feat` command output with a quantity greater than zero.
  If any of these capability point codes are shown in the `rtrv-sid` output: INP, EIR, G-Port, G-Flex, MNP, V-Flex, ATINPQ; then LNP capability point codes cannot be provisioned. If any of these features are enabled, and turned on if required: INP, ANSI-41 INP Query, EIR, G-Port, A-Port, G-Flex, IS41 GSM Migration, V-Flex, ATINP; then LNP capability point codes cannot be provisioned. If the LNP feature is not enabled, perform the procedures in *ELAP Administration and LNP Feature Activation User's Guide* to enable the LNP feature.
- INP capability point codes are specified with the `cpctype=inp` parameter. **INP** capability point codes can be either an **ITU**-I, 14-bit ITU-N, or 24-bit ITU-N point code, specified with either the `cpci`, `cpcn`, `cpcn24`, `ncpci`, `ncpcn`, or `ncpcn24` parameters. The INP or ANSI-41 INP Query feature must be enabled and turned on to specify the `cpctype=inp` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the INP or ANSI-41 INP Query feature is enabled and turned on.
  If **LNP** capability point codes are shown in the `rtrv-sid` output, or the LNP feature is enabled, INP capability point codes cannot be provisioned. If either the INP or ANSI-41 INP Query feature is not enabled or turned on, perform the procedures in the *INP/AINPQ User's Guide* to enable and turn on the INP or ANSI-41 INP Query feature.

- EIR capability point codes are specified with the `cpctype=eir` parameter. **EIR** capability point codes can be either an **ITU**-I, 14-bit **ITU**-N, or 24-bit **ITU**-N point code, specified with either the `cpci`, `cpcn`, `cpcn24`, `ncpci`, `ncpcn`, or `ncpcn24` parameters. The **EIR** feature must be enabled and turned on to specify the `cpctype=eir` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the **EIR** feature is enabled and turned on.
  If **LNP** capability point codes are shown in the `rtrv-sid` output, or the LNP feature is enabled, **EIR** capability point codes cannot be provisioned. If the **EIR** feature is not enabled or turned on, perform the procedures in **EIR** *User's Guide* to enable and turn on the **EIR** feature.
- G-Flex capability point codes are specified with the `cpctype=gflex` parameter. G-Flex capability point codes can be any point code type. The G-Flex feature must be enabled and turned on to specify the `cpctype=gflex` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the G-Flex feature is enabled and turned on. If LNP capability point codes are shown in the `rtrv-sid` output, or if the LNP feature is enabled, G-Flex capability point codes cannot be provisioned. If the G-Flex feature is not enabled or turned on, perform the procedures in *G-Flex User's Guide* to enable and turn the G-Flex feature on.
- G-Port capability point codes are specified with the `cpctype=gport` parameter. **G-Port** capability point codes can be any point code type. The **G-Port** feature must be enabled to specify the `cpctype=gport` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the **G-Port** feature is enabled. If **LNP** or **MNP** capability point codes are shown in the `rtrv-sid` output, or the LNP, A-Port, or IS41 GSM Migration features are enabled, **G-Port** capability point codes cannot be provisioned. If the **G-Port** feature is not enabled, perform the procedures in **G-Port** *User's Guide* to enable the **G-Port** feature.
- MNP capability point codes are specified with the `cpctype=mnp` parameter. **MNP** capability point codes can be any point code type. The **A-Port** feature or **IS41 GSM Migration** feature must be enabled to specify the `cpctype=mnp` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the **A-Port** feature or **IS41 GSM Migration** feature is enabled. If **LNP** or **G-Port** capability point codes are shown in the `rtrv-sid` output, or the LNP or G-Port features are enabled, **MNP** capability point codes cannot be provisioned. If the **A-Port** feature is not enabled, perform the procedures in **A-Port** *User's Guide* to enable the **A-Port** feature. If the **IS41 GSM Migration** feature is not enabled, perform the procedures in *IS41 GSM Migration User's Guide* to enable the **IS41 GSM Migration** feature.
- V-Flex capability point codes are specified with the `cpctype=vflex` parameter. **V-Flex** capability point codes can be any point code type. The V-Flex feature must be enabled and turned on to specify the `cpctype=vflex` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the V-Flex feature enabled and turned on. If LNP capability point codes are shown in the `rtrv-sid` output, or the LNP feature is enabled, V-Flex capability point codes cannot be provisioned. If the V-Flex feature is not enabled or turned on, perform the procedures in *V-Flex User's Guide* to enable and turn on the V-Flex feature.
- ATINPQ capability point codes are specified with the `cpctype=atinpq` parameter. **ATINPQ** capability point codes can be either an ANSI, ITU-I, or 14-bit ITU-N point code, specified with either the `cpc/cpca`, `cpci`, `cpcn`, `ncpc/ncpca`, `ncpci`, or `ncpcn` parameters.
  The **ATINP** feature must be enabled to specify the `cpctype=atinpq` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the **ATINP** feature is enabled. If **LNP** capability point codes are shown in the `rtrv-sid` output, or

the LNP feature is enabled, **ATINPQ** capability point codes cannot be provisioned. If the **ATINP** feature is not enabled, perform the procedures in *ATINP User's Guide* to enable the ATINP feature.

- AIQ capability point codes are specified with the `cpctype=aiq` parameter. **AIQ** capability point codes can be either an ANSI, ITU-I, or 14-bit ITU-N point code, specified with either the `cpc/cpca`, `cpci`, `cpcn`, `ncpc/ncpca`, `ncpci`, or `ncpcn` parameters. The **ANSI41 AIQ** feature must be enabled to specify the `cpctype=aiq` parameter. Enter the `rtrv-ctrl-feat` command to verify whether or not the **ANSI41 AIQ** feature is enabled. **AIQ** capability point codes can be specified regardless of which features, other than the ANSI41 AIQ feature, are enabled or turned on. If the **ANSI41 AIQ** feature is not enabled, perform the procedures in the *Analyzed Information Features User's guide* to enable the ANSI41 AIQ feature.

The `pctype` parameter of the `chg-sid` command determines the format of point codes (but not the **ITU** international or **ITU** national point codes) that can be used on the **EAGLE**, `ansi` and `other`. The value `ansi` means the **EAGLE** supports point codes that meet the **ANSI** standard. The value `other` means that the **EAGLE** supports point codes that do not meet the **ANSI** standard. The pctype parameter does not apply to **ITU** international or **ITU** national point codes. See the “ANSI Point Codes” in the Point Code Formats section for more information about **ANSI** point codes.

This procedure causes a change in the routing information for this node. Make sure that all other nodes that route messages to this node are notified of these changes.

The point code of the **EAGLE** cannot match the capability point codes of the **EAGLE**. The point code of the **EAGLE** and the capability point codes of the **EAGLE** are shown in 1.

The point code and capability point codes of the **EAGLE** cannot match any destination point codes. Use the `rtrv-dstn` command to display the destination point codes in the database.

The point code and capability point codes of the **EAGLE** cannot be defined as a destination point code of a route. Use the `rtrv-rte` command to display the destination point codes of the routes in the database.

The point code and capability point codes of the EAGLE cannot match any emulated point code (EPC) values that are shown in the rtrv-pct output

The point code of the **EAGLE** or the capability point codes, specified by the `pc/pca/pci/pcn/pcn24`, `cpc/cpca/cpci/cpcn/cpcn24` or `ncpc/ncpca/ncpci/ncpcn/ncpcn24` parameters, must be a full point code and cannot be a cluster point code. A point code containing all zeros cannot be used as a value for **ANSI** (`pc/pca`, `cpc/cpca`, `ncpc/ncpca`) and **ITU**-I (`pci`, `cpci`, `ncpci`) parameters. A point code containing all zeros can be used as a value for 14-bit **ITU**-N (`pcn`, `cpcn`, `ncpcn`) and 24-bit **ITU**-N (`pcn24`, `cpcn24`, `ncpcn24`) parameters.

If either the `cpctype` parameter or the capability point code parameter (`cpc/cpca/cpci/cpcn/cpcn24`) are specified, the other parameter must be specified.

If the new capability point code parameter (`ncpc/ncpca/ncpci/ncpcn/ncpcn24`) is specified, the capability point code parameter (`cpc/cpca/cpci/cpcn/cpcn24`) and the `cpctype` parameters must be specified.

Only one of the new capability point code parameters (`ncpc/ncpca/ncpci/ncpcn/npcn24`) can be specified with the `chg-sid` command.

The new capability point code (`ncpc/ncpca/ncpci/ncpcn/npcn24`) must be of the same point code type as the capability point code (`cpc/cpca/cpci/cpcn/cpcn24`) specified in the command. For example, if an **ITU** international capability point code (cpci) is being replaced, then only the ncpci parameter can be specified.

The point code of the **EAGLE** cannot be changed if it is referenced in the mated application table. Enter the rtrv-map command to verify if the **EAGLE**’s point code is being referenced in the mated application table. The **EAGLE**’s point code would be shown in the PCA, PCI, PCN, PCN24, MPCA, MPCI, MPCN, or MPCN24 fields of the rtrv-map command output. If the **EAGLE**’s point code is referenced by the mated application table, perform the Removing a Mated Application procedure in *Database Administration - GTT User's Guide*, and remove the mated applications that reference the **EAGLE**’s point code.

The destination point codes and alias point codes are shown in the DPCA, DPCI, DPCN, DPCN24, ALIASA, ALIASI, ALIASN, and ALIASN24 fields in the rtrv-dstn command output. Secondary point codes are shown in the SPCA, SPCI, SPCN, and SPCN24 fields in the rtrv-spc command output. The **EAGLE**’s point code and capability point codes are displayed in the PCA, PCI, PCN, PCN24, CPCA, CPCI, CPCN, and CPCN24 fields in the rtrv-sid command output. The **EAGLE**’s true point code and capability point codes cannot be shown in either the rtrv-dstn or rtrv-spc command outputs.

To assign group codes to a 14-bit **ITU**-N point code, the **ITU** duplicate point code and multiple point code support features must be on. If the **ITU** National Duplicate **Point Code** feature is on, the entry ITUDUPPC = on is shown in the rtrv-feat command output. If the multiple point code support feature is on, the entry MPC = on is shown in the rtrv-feat command output. For more information on using group codes with 14-bit **ITU**-N point codes, see the ITU National Duplicate Point Codes section.

Note:

Once the **ITU** duplicate point code and multiple point code support features are turned on with the chg-feat command, they cannot be turned off.
The **ITU** duplicate point code and multiple point code support features must be purchased before you turn this feature on with the chg-feat command.
If you are not sure if you have purchased the **ITU** duplicate point code and multiple point code support features, contact your Oracle Sales Representative or Account Representative.

If you wish to specify the pcn24 parameter with the chg-sid command and the rtrv-sid output shows the PCN field, the 14-bit **ITU**-N point code value, shown in the PCN field must be removed with the npcn=none parameter before the pcn24 parameter value can be specified by the chg-sid command. If the PCN field contains both spare and non-spare point code values, both the spare and non-spare 14-bit **ITU**-N point code values must be removed before the pcn24 parameter can be specified. If no value is shown in the PCN field, specifying the npcn=none parameter is not necessary.

If you wish to specify the pcn parameter with the chg-sid command and the rtrv-sid output shows the PCN24 field, the 24-bit **ITU**-N point code value, shown in the PCN24 field must be removed with the pcn24=none parameter before the pcn parameter value can be specified by the chg-sid command. If no value is shown in the PCN24 field, specifying the pcn24=none parameter is not necessary.

When the **EAGLE** is initially installed, the self-identification of the **EAGLE** must be configured before any destination point codes can be configured in the database.

For the examples in this procedure, the self-identification of the **EAGLE** is being changed to these values:

ANSI point code = 100-100-100

ITU international point code = 3-75-7

14-bit **ITU** national point code = 7-9-8-1

LNP capability point code = 006-006-006

The format of the 14-bit **ITU** national point codes used in these examples is 4-4-4-2.

Canceling the `RTRV-DSTN`, `RTRV-MAP`, and `RTRV-RTE` Commands

Because the `rtrv-dstn`, `rtrv-map`, and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-dstn`, `rtrv-map`, and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn`, `rtrv-map`, and `rtrv-rte` commands can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn`, `rtrv-map`, or `rtrv-rte` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn`, `rtrv-map`, or `rtrv-rte` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn`, `rtrv-map`, or `rtrv-rte` command was entered, from another terminal other than the terminal where the `rtrv-dstn`, `rtrv-map`, and `rtrv-rte` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the self-identification of the **EAGLE** using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 08-09-10 11:43:04 GMT  EAGLE5 39.2.0
   PCA              PCI          PCN                CLLI
PCTYPE
   001-001-001      1-200-6      10-13-9-3          rlghncxa03w       OTHER

   CPCA
   002-002-002        002-002-003        002-002-004        002-002-005
   002-002-006        002-002-007        002-002-008        002-002-009
   004-002-001        004-003-003        050-060-070

   CPCA (LNP)
   005-005-002        005-005-004        005-005-005

   CPCI
```

```
1-002-1          1-002-2          1-002-3          1-002-4
2-001-1          7-222-7

CPCN
2-0-10-3         2-0-11-0         2-0-11-2         2-0-12-1
2-2-3-3          2-2-4-0          10-14-10-1
```

Continue the procedure by performing one of these steps.

- If only the `CLLI` or `CLLI` and `PCTYPE` values are being changed, continue the procedure with 11.
- If only the `PCTYPE` value is being changed, continue the procedure with 19.
- If point codes will be specified in this procedure, continue the procedure by performing one of these steps.
  - If 14-bit or 24-bit ITU-N point codes will be specified, continue the procedure with 2.
  - If 14-bit or 24-bit ITU-N point codes will not be specified, continue the procedure with 5.

2. If you wish to specify the `pcn24` parameter with the `chg-sid` command and the `rtrv-sid` output shows the `PCN` field, the 14-bit **ITU**-N point code value, shown in the `PCN` field must be removed with the `npcn=none` parameter before the `pcn24` parameter value can be specified by the `chg-sid` command.

   Before the `npcn=none` parameter can be specified, any **ITU**-N point codes shown in the `rtrv-dstn` output must be removed. If no value is shown in the `PCN` field, then performing this step is not necessary. If the `PCN` field contains a point code, perform the Removing a Destination Point Code procedure to remove the **ITU**-N point codes. After the **ITU**-N point codes have been removed, enter this command.

   ```
   chg-sid:pcn=<current PCN value>:npcn=none
   ```

   If the `PCN` field contains both spare and non-spare point code values, both the spare and non-spare 14-bit **ITU**-N point code values must be removed from the `rtrv-dstn` and `rtrv-sid` outputs before the `pcn24` parameter can be specified.

   After the `PCN` value has been removed, continue the procedure with 6.

   If you wish to specify the `pcn` parameter with the `chg-sid` command and the `rtrv-sid` output shows the `PCN24` field, the 24-bit **ITU**-N point code value, shown in the `PCN24` field must be removed with the `pcn24=none` parameter before the `pcn` parameter value can be specified by the `chg-sid` command.

   Before the `pcn24=none` parameter can be specified, any **ITU**-N24 point codes shown in the `rtrv-dstn` output must be removed. If no value is shown in the `PCN24` field, then performing this step is not necessary. If the `PCN24` field contains a point code, perform the Removing a Destination Point Code procedure to remove the **ITU**-N24 point codes. After the **ITU**-N24 point codes have been removed, enter this command.

   ```
   chg-sid:pcn24=none
   ```

   After the `PCN24` value has been removed, continue the procedure with 3.

When the chg-sid command has successfully completed, this message should appear.

```
rlghncxa03w 06-05-07 09:17:40 GMT  EAGLE5 39.2.0
CHG-SID: MASP A - COMPLTD
```

A caution message is displayed indicating that the **EAGLE** needs to be reinitialized.

```
CAUTION: SYSTEM SITE ID HAS BEEN CHANGED, MANUAL RE-INITIALIZATION IS
NEEDED
```

3. Display the existing values for the `npcfmti` parameter, by entering the `rtrv-stpopts` command.

   The value for the `npcfmti`parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 08-09-17 16:02:05 GMT  EAGLE5 39.2.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

   If you wish to change the format of the 14-bit **ITU** national point codes, go to the 14-Bit ITU National Point Code Formats section. Changing the formats of the 14-bit **ITU** national point codes will change how any existing 14-bit **ITU** national point codes are displayed in the database.

   After this step has been performed, continue the procedure by performing one of these steps.

   - If group codes are shown in the `rtrv-sid` output, continue the procedure with 5.
   - If group codes are not shown in the `rtrv-sid` output, and group codes will not be specified with the 14-bit ITU-N point codes, continue the procedure with 5.
   - If group codes are not shown in the `rtrv-sid` output, and group codes will be specified with the 14-bit ITU-N point codes, continue the procedure with 4.

4. Enter the `rtrv-feat` command to verify that the **Multiple Point Code** Support and **ITU** Duplicate **Point Code** Support features are on.

   If the **Multiple Point Code** Support feature is on, the `MPC` field should be set to `on`. If the **ITU** Duplicate **Point Code**Support feature is on, the `ITUDUPPC` field should be set to `on`. For this example, these features are off.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the **ITU** Duplicate **Point Code** Support feature is off and the **Multiple Point Code** feature is on, enter this command.

`chg-feat:ituduppc=on`

If both features are off, enter this command.

`chg-feat:mpc=on:ituduppc=on`

When the `chg-feat` has successfully completed, this message should appear.

```
rlghncxa03w 08-09-07 00:57:31 GMT EAGLE5 39.2.0
CHG-FEAT: MASP A - COMPLTD
```

5. If spare point codes are being specified in this procedure, the **ITU** National and International **Spare Point Code** Support feature must be enabled.

> **Note:**
>
> If an ITU-I or 14-bit ITU-Nspare point code is displayed in the `rtrv-sid` output in 1, or if an ITU-I or 14-bit ITU-N spare point code is not being specified in this procedure, continue the procedure with 6. The `rtrv-ctrl-feat` command shows the status of the ITU National and International Spare Point Code Support feature.

Enter the `rtrv-ctrl-feat` command with the part number of this feature.

Enter this command.

`rtrv-ctrl-feat:partnum=893013601`

This is an example of the possible output.

```
rlghncxa03w 08-09-28 21:15:37 GMT EAGLE5 39.2.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
Spare Point Code Support  893013601 on     ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.
```

```
The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the **ITU** National and International **Spare Point Code** Support feature is not enabled, perform the Activating the ITU National and International Spare Point Code Support Feature procedure to enable the **ITU** National and International **Spare Point Code** Support feature.

6. The point codes specified in this procedure cannot be shown in the `rtrv-dstn` command output.

   Display the point codes in the destination point code table by using the `rtrv-dstn` command. This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   001-002-003   ls04clli    yes --- ----------      --------------   SS7
   002-002-002   ls01clli    no  --- ----------      --------------   SS7
   002-007-008   ls06clli    yes --- ----------      --------------   SS7
   003-003-003   ls03clli    yes --- ----------      --------------   SS7
   004-004-004   ls02clli    yes --- ----------      --------------   SS7
   179-100-087   ----------- yes --- ----------      --------------   SS7
   200-050-176   ----------- yes --- ----------      --------------   SS7
   240-007-000   ----------- yes --- ----------      --------------   SS7
   240-012-004   rlghncbb001 yes ---    1-111-1         10-13-9-3      SS7
   240-012-005   rlghncbb002 yes ---    1-112-2         10-13-10-0     SS7
   240-012-006   rlghncbb003 yes ---    1-112-3         10-13-10-1     SS7
   240-012-008   ----------- yes ---    1-113-5         10-13-10-2     SS7

   DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24     DMN
   2-131-1       rlghncbb023 no  ---    222-210-000     11-11-8-1      SS7
   2-131-2       ----------- no  ---    222-211-001     11-11-8-2      SS7
   2-131-3       ----------- no  ---    222-211-002     11-11-8-3      SS7
   3-150-4       lsi7clli    yes --- --------------  --------------   SS7

   DPCN          CLLI        BEI ELEI   ALIASA          ALIASI         DMN
   10-6-15-1     lsn5clli    yes --- --------------  ----------       SS7
   10-15-2-3     rlghncbb013 no  ---    222-200-200     2-121-1        SS7
   10-15-3-0     rlghncbb013 no  ---    222-200-201     2-121-2        SS7

Destination table is (19 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

Continue the procedure by performing one of these steps.

- If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is not being changed, continue the procedure with 10.
- If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is being changed to another point code value, continue the procedure with 9.

- If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is being removed, continue the procedure with 8.

7. The point codes specified in this procedure cannot be shown in the rtrv-pct output as an emulated point code (EPC). Display the PCT entries by entering the `rtrv-pct` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA              FILTPCA           REALPCA       SI   SSN  RELCAUSE
    001-001-001       *                 240-012-006    5   ---  10

    ECICS = 10           ECICE = 20
    RCICS = 30           RCICE = 40

    EPCI              FILTPCI           REALPCI       SI   SSN  RELCAUSE
    1-001-2           2-131-2           2-131-3        3    10  ---

    ECICS = ----------   ECICE = ----------
    RCICS = ----------   RCICE = ----------

    EPCN              FILTPCN           REALPCN       SI   SSN  RELCAUSE
    13-11-14-1        *                 10-15-2-3      *   ---  ---

    ECICS = ----------   ECICE = ----------
    RCICS = ----------   RCICE = ----------


 Unique EPC    is 3 of 250
 Unique RealPC is 3 of 250

PCT table is (3 of 1000) 1% full.
```

   Continue the procedure by performing one of these steps.

   - If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is not being changed, continue the procedure with 10.
   - If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is being changed to another point code value, continue the procedure with 9.
   - If the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter value is being removed, continue the procedure with 8.

8. For the **EAGLE** to have point codes of a particular network type (**ANSI**, **ITU**-I, or **ITU**-N), a point code of that same type must be defined by the `pc`/`pca`/`pci`/`pcn`/`pcn24` parameter of the `chg-sid` command.

   To remove a point code defined by the `pc/pca/pci/pcn/pcn24`parameter, all point codes of the same network type as the point code being removed in this procedure must be removed from the database.

   If the `rtrv-dstn` output in 6 shows that there are no point codes of the same network type as the point code being removed, continue the procedure with 11.

If the `rtrv-dstn` output in 6 shows that there are point codes of the same network type as the point code being removed, perform the Removing a Destination Point Code procedure and remove the point codes shown in the `rtrv-dstn` output in 6 that are the same network type as the point code being removed in this procedure.

After this step is performed, continue the procedure with 11.

9. Display the mated applications in the database, using the `rtrv-map` command.

   This is an example of the possible output.

```
rlghncxa03w 09-07-07 00:34:31 GMT EAGLE5 41.1.0

   PCA           Mate PCA      SSN RC MULT SRM MRC GRP NAME SSO
   255-001-000                 250 10  SOL *N  *N  GRP01    ON

   255-001-000                 251 10  SHR *Y  *Y  GRP01    OFF
                 253-001-002   254 10  SHR *Y  *Y  GRP01    OFF

   255-001-000                 252 10  SOL *Y  *Y  GRP01    ON

   255-001-000                 253 10  SHR *N  *N  GRP01    OFF
                 253-001-004   254 10  SHR *N  *N  GRP01    OFF

   255-001-001                 255 10  DOM YES YES GRP01    ON
                 253-001-005   254 20  DOM YES YES GRP01    ON

   255-001-001                 250 10  DOM YES YES GRP01    OFF
                 253-001-001   254 20  DOM YES YES GRP01    OFF

   255-001-002                 251 10  SHR *Y  *Y  GRP01    OFF
                 255-001-002   254 10  SHR *Y  *Y  GRP01    OFF

   255-001-002                 252 10  DOM YES YES GRP01    ON
                 255-001-003   254 20  DOM YES YES GRP01    ON

   255-001-002                 253 10  SHR *Y  *Y  GRP01    ON
                 255-001-004   254 10  SHR *Y  *Y  GRP01    ON


PCI              Mate PCI      SSN RC MULT SRM MRC GRP NAME SSO
2-001-2                        255 10  DOM NO  NO  GRP03    OFF
                 2-001-1       254 20  DOM NO  NO  GRP03    OFF


PCN              Mate PCN      SSN RC MULT SRM MRC GRP NAME SSO
0-5-6-3                        253 10  SHR NO  *Y  GRP05    OFF
                 1-5-10-3      254 10  SHR NO  *N  GRP05    OFF

MAP TABLE IS (20 of 1024)  2 % FULL
```

   If the **EAGLE**’s point code is shown in the `rtrv-map` command output (in the `PCA`, `PCI`, `PCN`, `PCN24`, `MPCA`, `MPCI`, `MCPN`, or `MPCN24` fields), perform the Removing a Mated Application procedure in the *Database Administration - GTT User's Guide*, and remove the **EAGLE**’s point code from the mated application table.

10. Display the secondary point codes in the database, using the `rtrv-spc` command.

    This is an example of the possible output.

```
rlghncxa03w 08-09-07 11:43:04 GMT  EAGLE5 39.2.0
SPC (Secondary Point Codes)
SPCA
     001-010-010
     002-010-010
     003-010-010
     010-100-010
SPC-I
         1-253-5
         2-254-6
         3-255-7
         4-100-1
SPC-N
        10-01-11-1
        13-02-12-0
        14-15-12-1
SPC-N24
none
Secondary Point Code table is (11 of 40) 28% full
```

    If the **EAGLE**'s point code or capability point code that is being configured in this procedure is shown in 6 or 10, choose another point code to configure with this procedure.

    Continue the procedure by performing one of these steps.
    - If the `clli` parameter value is not being changed, continue the procedure with 15.
    - If the `clli` parameter value is being changed, continue the procedure with 11.

11. Enter the `rtrv-feat` command, or examine the `rtrv-feat` output in 4, if 4 was performed, to verify that the Eagle Support for **Integrated Sentinel** feature is on.

    If the Eagle Support for **Integrated Sentinel** feature is on, the `E5IS` field should be set to `on`.

    > **Note:**
    >
    > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

    Continue the procedure by performing one of these steps.
    - If the Eagle Support for **Integrated Sentinel** feature is not on, continue the procedure with 15.

- If the Eagle Support for **Integrated Sentinel** feature is on, continue the procedure with 12.

12. Display the **EISCOPY** option by entering the `rtrv-eisopts` command.

    This is an example of the possible output.

```
rlghncxa03w 10-07-07 11:43:04 GMT  EAGLE5 42.0.0
EIS OPTIONS
------------------
EISCOPY = ON

FAST COPY OPTIONS
--------------------------------
FCGPL = IPSG       FCMODE = FCOPY
FCGPL = IPGHC      FCMODE = FCOPY
--------------------------------
```

    Continue the procedure by performing one of these steps.
    - If the **EISCOPY** option is off, continue the procedure with 15.
    - If the **EISCOPY** option is on, continue the procedure by performing one of these steps..
      – If the `FCMODE` value for all the GPLs shown in the `rtrv-eisopts` output is OFF, continue the procedure with 15.
      – If the `FCMODE` value for any of the GPLs shown in the `rtrv-eisopts` output is `STC` or `FCOPY`, continue the procedure with 13.

13. Change the FCMODE values for all the GPLs shown in 12 to `OFF` by entering this command.

    `chg-eisopts:fcmode=off:fcgpl=all`

    When the `chg-eisopts` has successfully completed, this message should appear.

```
rlghncxa03w 10-07-07 11:43:04 GMT  EAGLE5 42.0.0
CHG-EISOPTS: MASP A - COMPLTD
```

14. Turn the **EISCOPY** option off by entering the `chg-eisopts` command with the `eiscopy=off` parameter.

    > **Caution:**
    >
    > Changing the **EISCOPY** option to `off` will disable the Eagle Support for **Integrated Sentinel** feature.

When the `chg-eisopts` has successfully completed, this message should appear.

```
rlghncxa03w 08-09-07 11:43:04 GMT  EAGLE5 39.2.0
CHG-EISOPTS: MASP A - COMPLTD
```

Continue the procedure by performing one of these steps.

- If capability point codes will not be provisioned in this procedure, continue the procedure with 19.
- If capability point codes will be provisioned in this procedure, continue the procedure with 15.

15. To add a particular type of **CPC**, only one **CPC** type (the `cpctype` parameter) can be specified with the `chg-sid` command, and the feature corresponding to the **CPC** type must be enabled or turned on.

    The EAGLE supports these types of CPCs.

    - STP CPCs - no feature is required to be enabled or turned on to specify STP CPCs. If you wish to add an STP CPC, continue the procedure with 19.
    - **LNPCPCs** - If you wish to add an LNP CPC and LNP CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If only STP CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 18. If any of these CPCs are shown in the `rtrv-sid` output in 1: INP, G-Port, G-Flex, EIR, MNP, V-Flex, ATINPQ, LNP CPCs cannot be added.
    - **INP** CPCs - If you wish to add an INP CPC and INP CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If INP and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, INP CPCs cannot be added.
    - G-Flex CPCs - If you wish to add a G-Flex CPC and G-Flex CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If G-Flex and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, G-Flex CPCs cannot be added.
    - **MNP** CPCs - If you wish to add an MNP CPC and MNP CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If MNP and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, MNP CPCs cannot be added.
    - **EIR** CPCs - If you wish to add an EIR CPC and EIR CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If EIR and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, EIR CPCs cannot be added.
    - **V-Flex** CPCs - If you wish to add a V-Flex CPC and V-Flex CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If V-Flex and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, V-Flex CPCs cannot be added.

- **ATINPQ** CPCs - If you wish to add an ATINPQ CPC and ATINPQ CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If ATINPQ and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16. If LNP CPCs are shown in the `rtrv-sid` output in 1, ATINPQ CPCs cannot be added.
- G-Port CPCs - If you wish to add a G-Port CPC and G-Port CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If G-Port, MNP, and LNP CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 17. If LNP or MNP CPCs are shown in the `rtrv-sid` output in 1, G-Port CPCs cannot be added.
- **AIQ** CPCs - If you wish to add an AIQ CPC and AIQ CPCs are shown in the `rtrv-sid` output in 1, continue the procedure with 19. If AIQ CPCs are not shown in the `rtrv-sid` output in 1, continue the procedure with 16.

16. To specify these types of CPCs: INP, G-Flex, MNP, EIR, V-Flex, ATINPQ, AIQ, the following features must be enabled, and turned on if necessary.
    - INP CPCs - the INP or ANSI-41 INP Query features must be enabled and turned on.
    - G-Flex CPCs - the G-Flex feature must be enabled and turned on.
    - EIR CPCs - the EIR feature must be enabled and turned on.
    - MNP CPCs - the A-Port or IS41 GSM Migration features must be enabled.
    - V-Flex CPCs - the V-Flex feature must be enabled and turned on.
    - ATINPQ CPCs - the ATINP feature must be enabled.
    - AIQ CPCs - the ANSI41 AIQ feature must be enabled.

    Enter the `rtrv-ctrl-feat` command to verify the status of the feature required for the CPC that is being added. This is an example of the possible output.

```
rlghncxa03w 08-09-28 21:15:37 GMT EAGLE5 39.2.0
The following features have been permanently enabled:

Feature Name               Partnum    Status  Quantity
Command Class Management   893005801  on      ----
Intermed GTT Load Sharing  893006901  on      ----
XGTT Table Expansion       893006101  on      4000000
XMAP Table Expansion       893007710  on      3000
Large System # Links       893005901  on      1500
Routesets                  893006401  on      6000
HC-MIM SLK Capacity        893012707  on      64

The following features have been temporarily enabled:

Feature Name               Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name               Partnum
Zero entries found.
```

If the LNP feature is enabled, LNP, AIQ, or STP CPCs can be specified in this procedure. If an AIQ CPC will be provisioned, continue with this step. If an LNP or STP CPC will be provisioned, continue the procedure with 19.

If the feature that is required for the CPC that is being added is enabled, and turned on if required, continue the procedure with 19.

If the feature that is required for the CPC that is being added is not enabled, or turned on if required, perform the procedures in one of the following manuals to enable, and turn on if required, the feature required to support the CPC that is being added.

- INP CPCs - *INP/AINPQ User's Guide* – to enable and turn on the INP or ANSI-41 INP Query features.
- G-Flex CPCs - *G-Flex User's Guide* – to enable and turn on the G-Flex feature.
- EIR CPCs - *EIR User's Guide* – to enable and turn on the EIR feature.
- MNP CPCs - *A-Port User's Guide* to enable the A-Port feature, or *IS41 GSM Migration User's Guide* – to enable the IS41 GSM Migration feature.

> **Note:**
>
> If G-Port CPCs are shown in the `rtrv-sid` output, when the A-Port or IS41 GSM Migration features are enabled, the G-Port CPCs are changed to MNP CPCs.

- V-Flex CPCs - *V-Flex User's Guide* – to enable and turn on the V-Flex Feature.
- ATINPQ CPCs - *ATINP User's Guide* – to enable the ATINP feature.
- AIQ CPCs - *Analyzed Information Features User's Guide* – to enable the ANSI41 AIQ feature.

After the required feature has been enabled, and turned on if required, continue the procedure with 19.

17. To provision G-Port CPCs, the G-Port feature must be enabled. Verify that the G-Port feature is enabled by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 08-09-28 21:15:37 GMT EAGLE5 39.2.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:
```

```
Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If G-Port feature is enabled, continue the procedure with 19.

If the G-Port feature is not enabled, perform the procedures in the *G-Port User's Guide* to enable the G-Port feature. After the G-Port feature has been enabled, continue the procedure with 19.

If the LNP feature is enabled, LNP, AIQ, or STP CPCs can be specified in this procedure. If an AIQ CPC will be provisioned, continue the procedure with 16. If an LNP or STP CPC will be provisioned, continue the procedure with 19.

If either the A-Port or IS41 GSM Migration features are enabled, G-Port CPCs cannot be provisioned. If you wish to provision other types of CPCs, go back to 15 and select another type of CPC to provision. If you do not wish to provision other CPCs, continue the procedure with 19 to provision the self identification without provisioning CPCs.

18. To provision LNP CPCs, the LNP feature must be enabled. Verify that the LNP feature is enabled by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 08-09-28 21:15:37 GMT EAGLE5 39.2.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the LNP feature is enabled, continue the procedure with 19.

If the LNP feature is not enabled and none of the features shown in 16 or 17 are enabled, except ANSI41 AIQ, and turned on if required, perform the procedures in *ELAP*

Administration and LNP Feature Activation User's Guide to enable the LNP feature. After the LNP feature has been enabled, continue the procedure with 19. AIQ CPCs can be provisioned regardless of which features are enabled or turned on. The ANSI41 AIQ feature must be enabled to provision AIQ CPCs.

If any of the features shown in 16 or 17 are enabled, and turned on if required, except ANSI41 AIQ, LNP CPCs cannot be specified. If you wish to provision CPCs for the features that are enabled, and turned on if required, go back to 15 and select another type of CPC to provision. If you do not wish to provision other CPCs, continue the procedure with 19 to provision the self identification without provisioning CPCs.

19. Change the value of the self-identification of the **EAGLE**, using the `chg-sid` command.

    For this example, the point code of the **EAGLE** is being changed to these values:

    - **ANSI** point code = 100-100-100
    - **ITU** international point code = 3-75-7
    - **ITU** national point code = 7-9-8-1
    - **LNP** capability point code = 006-006-006

    To make these changes, enter this command.

    ```
    chg-sid:pca=100-100-100:pci=3-75-7:pcn=7-9-8-1 :cpca=006-006-006
    :cpctype=lnp
    ```

    If you wish to configure network routing point codes using the network indicator values 1 through 5, the `pctype` parameter value must be `other`. For more information on network routing point codes, see the Network Routing section.

    When this command has successfully completed, this message should appear.

    ```
    rlghncxa03w 08-09-07 09:17:40 GMT  EAGLE5 39.2.0
    CHG-SID: MASP A - COMPLTD
    ```

    If any of the `pc/pca/pci/pcn/pcn24` parameters are changed, the **EAGLE** needs to be reinitialized. A caution message is displayed indicating that the **EAGLE** needs to be reinitialized.

    ```
    CAUTION: SYSTEM SITE ID HAS BEEN CHANGED, MANUAL RE-INITIALIZATION
    IS NEEDED
    ```

    If the CLLI value has been changed, and the SEAS over IP feature is enabled and turned on, shown in the `rtrv-ctrl-feat` output, this caution messages appears.

    ```
    CAUTION: System CLLI has changed, CCSMR re-configuration required
    ```

If the gateway screening redirect function's DPC is the `pc/pca/pci/pcn/pcn24` parameter value and this parameter value was changed in this step, this caution message appears.

```
CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION'S DPC
```

Continue the procedure by performing one of these steps.

- If the `pc/pca/pci/pcn/pcn24` and `clli` parameters were not changed, continue the procedure with 27.
- If the `clli` parameter was changed, but the `pc/pca/pci/pcn/pcn24` was not changed, continue the procedure by performing one of these steps.
  - If this caution message, `CAUTION: System CLLI has changed, CCSMR re-configuration required`, appeared after the `chg-sid` command was performed, continue the procedure with 23.
  - If the caution message did not appear after the `chg-sid` command was performed, continue the procedure with one of these steps.
    - If the EISCOPY option was changed in 14, continue the procedure with 24.
    - If the EISCOPY option was not changed in 14, continue the procedure with 27.
- If the `pc/pca/pci/pcn/pcn24` parameter was changed, continue the procedure by performing one of these steps.
  - If you wish to change the `RSTRDEV` STP option, continue the procedure with 20.
  - If you do not wish to change the `RSTRDEV` STP option, continue the procedure with 21.

20. Enter the `rtrv-stpopts` command to display the setting of the `rstrdev` parameter.

    21 instructs you to enter the `init-sys` command.

    If you do not want the **EAGLE** to restore previous device states after the `init-sys` command has executed and `RSTRDEV` value is `on` in the `rtrv-stpopts` output, enter the `chg-stpopts:off=rstrdev` command.

    If you want the **EAGLE** to restore previous device states after the `init-sys` command has executed, and `RSTRDEV` value is `off` in the `rtrv-stpopts` output, enter the `chg-stpopts:on=rstrdev` command.

    Continue with 21.

    > **Caution:**
    >
    > The `init-sys` command causes a complete EAGLE reload, and should only be used during periods of low traffic. Using this command ensures the updated self-identification information is loaded onto all cards, but will interrupt service.

> **Caution:**
>
> The `rstrdev` value of the `chg-stpopts` command can be used to turn on the Persistent Device States (**PDS**) feature. When PDS is turned off and the `init-sys` command executes, the EAGLE does not retain the manually initiated state (for example, OOS-MT-DSBLD) for the signaling links, cards, or terminals. After the command executes, the EAGLE attempts to bring all provisioned signaling links, cards, and terminals on-line, including those that were previously out of service. You will need to manually put each device back into its previous state after the EAGLE is back on-line. It is, therefore, advisable to print or electronically capture the output of the `rept-stat-slk`, `rept-stat-card`, and `rept-stat-trm` commands for reference prior to issuing the`init-sys` command. To restore a device to its previous state, issue the appropriate inhibit/deactivate command listed in *Commands User's Guide* in the Related Commands section for each of the above `rept-stat` commands. When **PDS** is turned on using the `chg-stpopts:on=rstrdev` command, the EAGLE restores the previous device states of signaling links, terminals, and cards after the `init-sys` command has executed.

21. Reinitialize the **EAGLE** by entering the `init-sys` command.

> **Note:**
>
> Th e`init-sys` command must be entered twice within 30 seconds for the EAGLE to be re-initialized. If the `init-sys` command is not executed twice within 30 seconds, the attempt to re-initialize the EAGLE is aborted.

When the `init-sys` command is first entered, this message should appear.

```
rlghncxa03w 08-09-28  07:05:01 GMT  EAGLE5 39.2.0
CAUTION: This command causes a complete system reload, and
will result in traffic loss.
Re-enter command within 30 seconds to confirm.
```

When the `init-sys` command is re-entered within the 30 second time limit, this message should appear.

```
rlghncxa03w 08-09-28  07:05:17 GMT  EAGLE5 39.2.0
Init System command issued at terminal #3
```

From the time that the `init-sys` command is accepted, you must wait approximately two minutes before you can perform 22 (logging onto the **EAGLE**). If the **EAGLE** terminal is in the **VT**-100/**VT**-320 mode, the terminal display will be refreshed with non-zero alarm counts. During this 2-minute interval, an intermediate screen refresh is caused by the **MASPs** role change from active to standby, and from standby to active. This screen refresh is typically a partial refresh, and the alarm indicators are set to zero.

If you are logged into the EAGLE in the **KSR** mode, the only response you will receive indicating that you are now able to log into the EAGLE is UAM 0009, MASP became active. **UAM** 0009 could be issued twice due to possible transient **MASP** role change (switching from active to standby).

Following the execution of the `init-sys` command, the **MASP** that was active before the `init-sys` command was entered will be the active **MASP** when the EAGLE has finished reinitializing.

22. Log into the **EAGLE** using the `login` command (or the `act-user` command).

    This is an example of the messages that appear when the login session has successfully completed.

    ```
    NOTICE: This is a private computer system.
    Unauthorized access or use may lead to prosecution.
    0 LOGIN failures since last successful LOGIN
    Last successful LOGIN was on port 4 on 04-06-02 @ 09:34:56
    ```

    If the `clli` parameter was not changed in 19, continue the procedure by performing one of these steps.

    - If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was displayed in 19, continue the procedure with 26.
    - If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was not displayed in 19, continue the procedure with 27.

    If this caution message, CAUTION: System CLLI has changed, CCSMR re-configuration required, appeared in 19, continue the procedure with 23. If the caution message did not appear in 19, continue the procedure by performing one of these steps.

    - If the EISCOPY option was changed in 14, continue the procedure with 24.
    - If the EISCOPY option was not changed in 14, continue the procedure by performing one of these steps.
      – If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was displayed in 19, continue the procedure with 26.
      – If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was not displayed in 19, continue the procedure with 27.

23. Perform the procedures in the "SEAS Over IP Configuration Procedures" chapter in *Database Administration - System Management User's Guide* to re-configure the CCSMRs with the new CLLI information.

    After the CCSMRs have been re-configured, continue the procedure by performing one of these steps.

    - If the EISCOPY option was changed in 14, continue the procedure with 24.
    - If the EISCOPY option was not changed in 14, continue the procedure by performing one of these steps.

- If the CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION'S DPC message was displayed in 19, continue the procedure with 26.
- If the CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION'S DPC message was not displayed in 19, continue the procedure with 27.

24. Turn the **EISCOPY** option on by entering the `chg-eisopts` command with the `eiscopy=on` parameter.

> **Caution:**
>
> The Eagle Support for the**Integrated Sentinel** feature will be disabled if this step is not performed.

When the `chg-eisopts` has successfully completed, this message should appear.

```
rlghncxa03w 08-09-28  07:05:01 GMT  EAGLE5 39.2.0
CHG-EISOPTS: MASP A - COMPLTD
```

After the EISCOPY option has been changed, continue the procedure by performing one of these steps.

- If the FCMODE value was changed in 13, continue the procedure with 25.
- If 13 was not performed, continue the procedure by performing one of these steps.
  - If the CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION'S DPC message was displayed in 19, continue the procedure with 26.
  - If the CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION'S DPC message was not displayed in 19, continue the procedure with 27.

25. Change the FCMODE values that were changed in 13 to the values that were displayed in 12 by entering the `chg-eisopts` command with the `fcmode` and `fcgpl` parameter values that were displayed in 12. If all the GPL values were changed in 13, the `gpl=all` parameter can be specified with the chg-eisopts command.

For this example, enter this command.

`chg-eisopts:fcmode=fcopy:fcgpl=all`

When the `chg-eisopts` has successfully completed, this message should appear.

```
rlghncxa03w 10-07-28  07:05:01 GMT  EAGLE5 42.0.0
CHG-EISOPTS: MASP A - COMPLTD
```

Continue the procedure by performing one of these steps.

- If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was displayed in 19, continue the procedure with 26.
- If the `CAUTION: SYSTEM SITE ID WAS REFERENCED BY THE REDIRECT FUNCTION’S DPC` message was not displayed in 19, continue the procedure with 27.

26. If the point code of the **EAGLE** or capability point code is referenced by the gateway screening redirect function and the gateway screening redirect function is enabled, the gateway screening redirect function’s **DPC** must be changed to reference the new **EAGLE**’s point code.

    Use the `chg-gws-redirect` command to change the gateway screening redirect function’s **DPC**. Perform the Changing the Gateway Screening Redirect Parameters procedure in the *Database Administration - Features User's Guide* to change the gateway screening redirect function’s **DPC**.

27. Verify the changes using the `rtrv-sid` command.

    This is an example of the possible output.

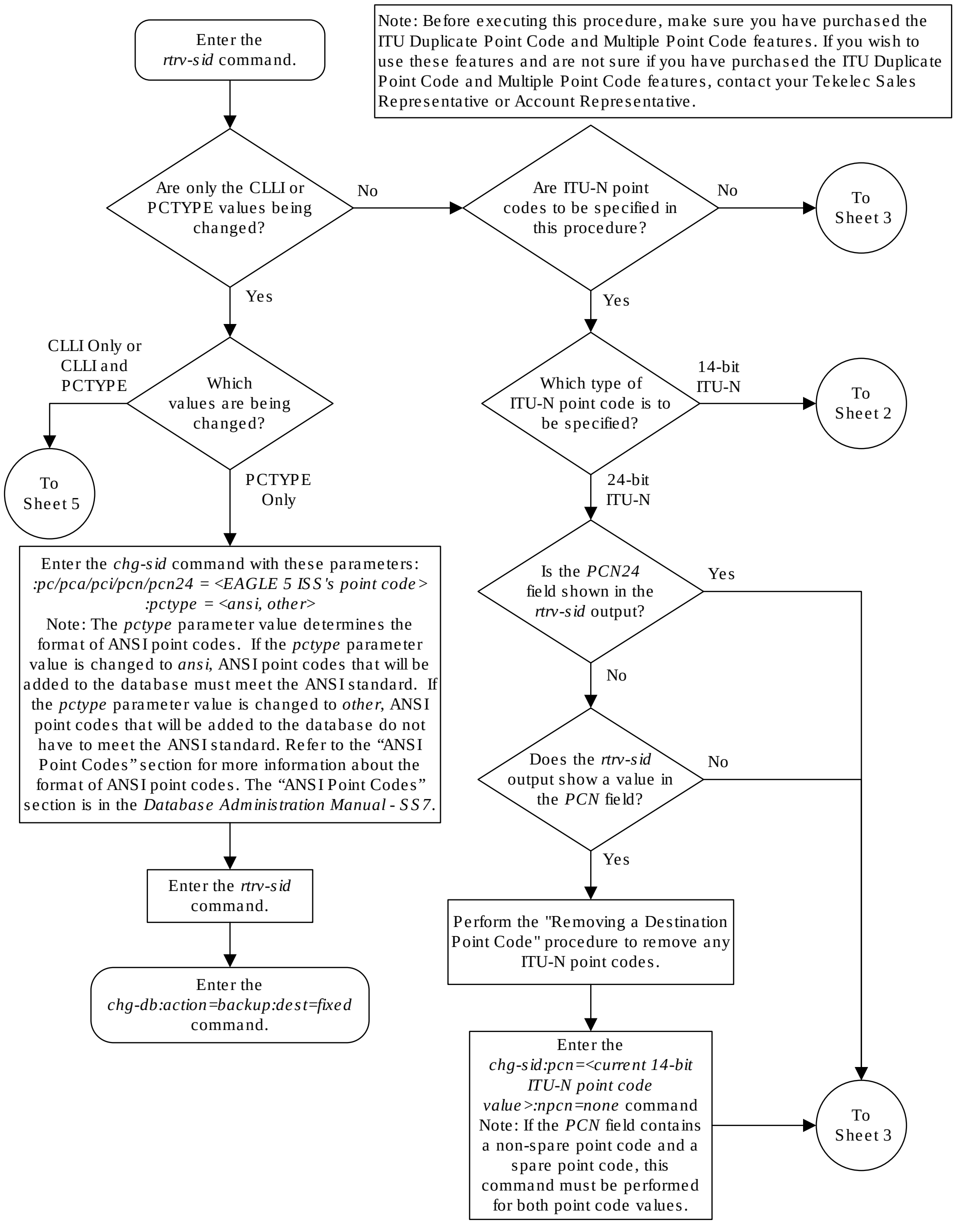
```
rlghncxa03w 08-09-10 11:43:04 GMT  EAGLE5 39.2.0
   PCA              PCI          PCN                CLLI
PCTYPE
   100-100-100      3-75-7       7-9-8-1            rlghncxa03w       OTHER

   CPCA
   002-002-002        002-002-003        002-002-004       002-002-005
   002-002-006        002-002-007        002-002-008       002-002-009
   004-002-001        004-003-003        050-060-070

   CPCA (LNP)
   005-005-002        005-005-004        005-005-005       006-006-006

   CPCI
   1-002-1            1-002-2            1-002-3           1-002-4
   2-001-1            7-222-7

   CPCN
   2-0-10-3           2-0-11-0           2-0-11-2          2-0-12-1
   2-2-3-3            2-2-4-0            10-14-10-1
```

28. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

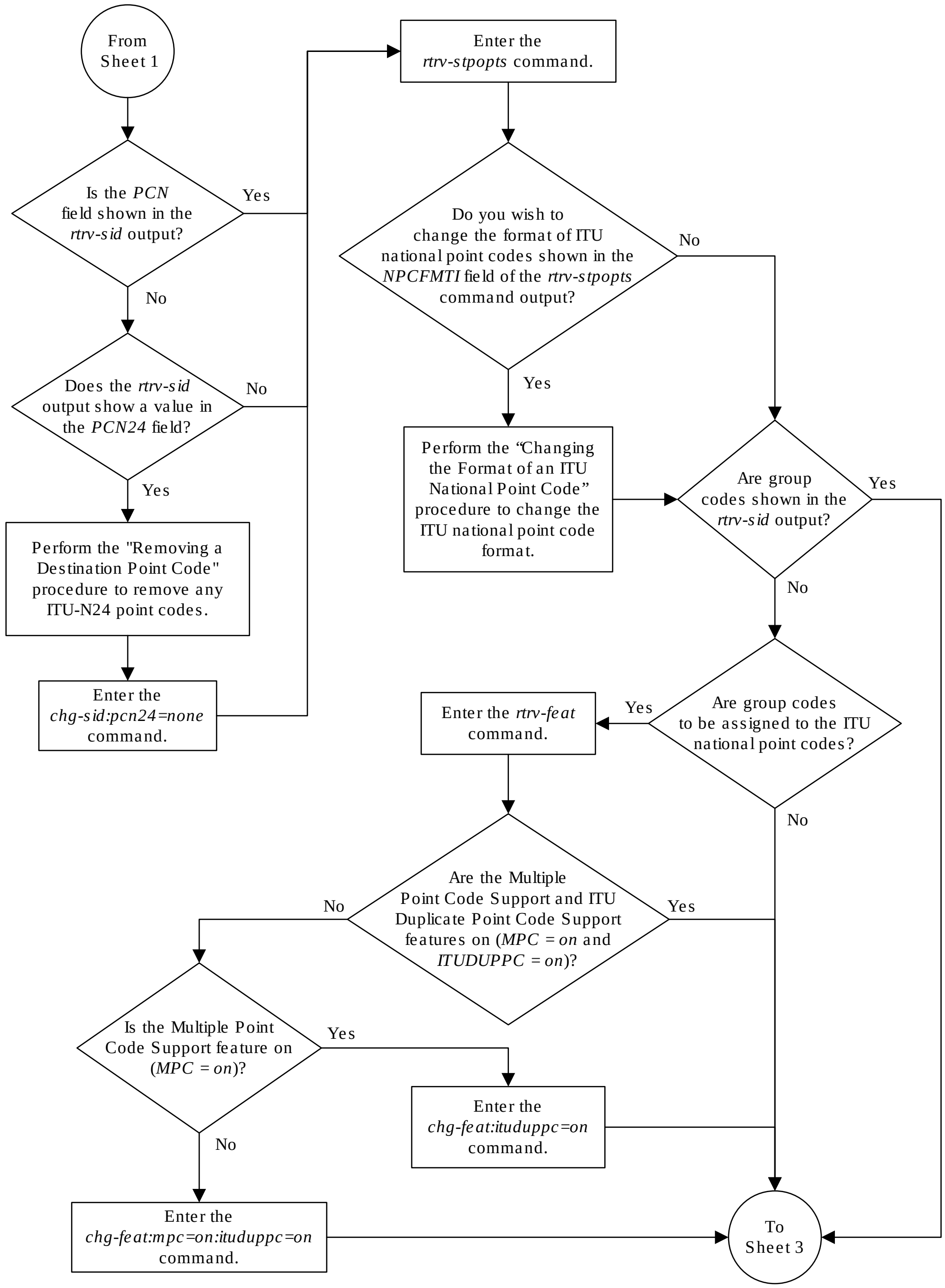
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

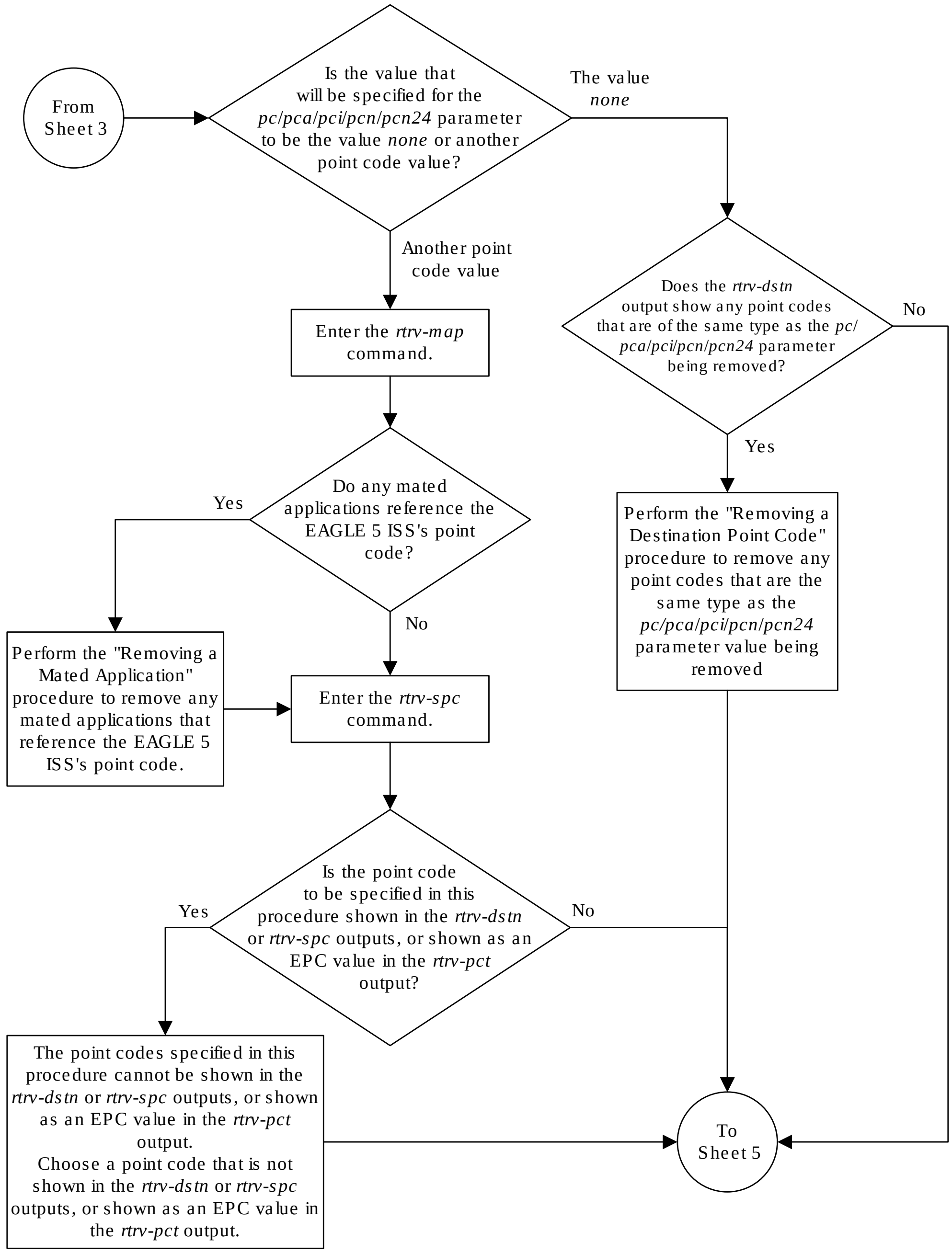
Figure 2-20 Changing the Self-Identification of the EAGLE



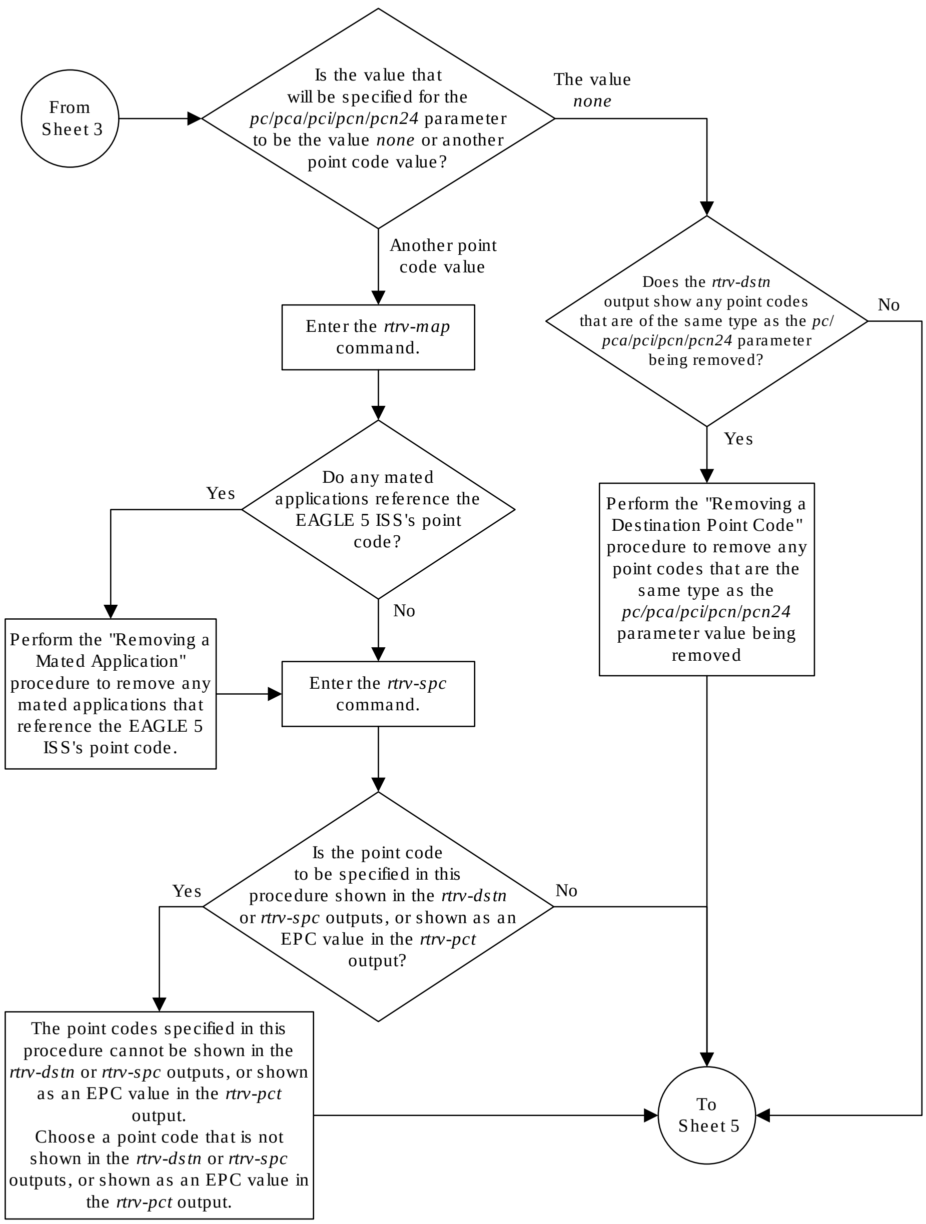
Sheet 1 of 11


From Sheet 1
Is the PCN field shown in the rtrv-sid output?
Yes
No
Does the rtrv-sid output show a value in the PCN24 field?
No
Yes
Perform the "Removing a Destination Point Code" procedure to remove any ITU-N24 point codes.
Enter the chg-sid:pcn24=none command.
Enter the rtrv-stpopts command.
Do you wish to change the format of ITU national point codes shown in the NPCFMTI field of the rtrv-stpopts command output?
No
Yes
Perform the "Changing the Format of an ITU National Point Code" procedure to change the ITU national point code format.
Are group codes shown in the rtrv-sid output?
Yes
No
Are group codes to be assigned to the ITU national point codes?
Yes
No
Enter the rtrv-feat command.
Are the Multiple Point Code Support and ITU Duplicate Point Code Support features on (MPC = on and ITUDUPPC = on)?
No
Yes
Is the Multiple Point Code Support feature on (MPC = on)?
Yes
No
Enter the chg-feat:ituduppc=on command.
Enter the chg-feat:mpc=on:ituduppc=on command.
To Sheet 3

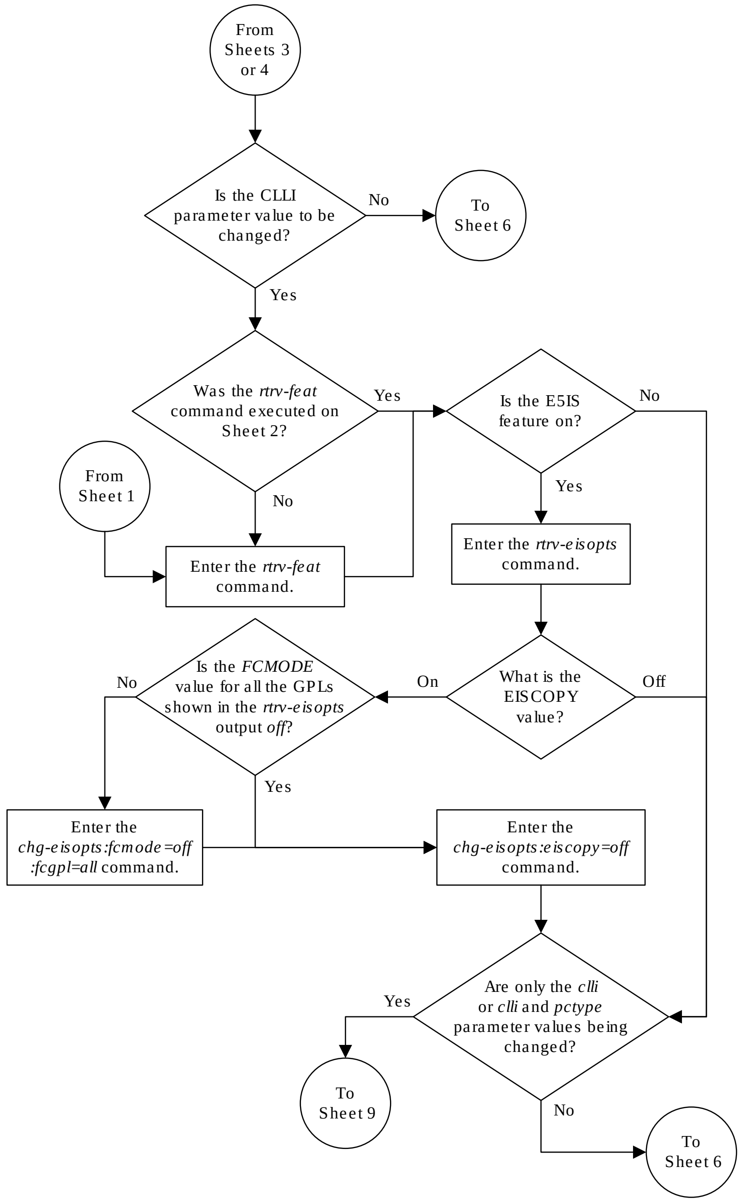
Sheet 2 of 11


From Sheet 3
Is the value that will be specified for the *pc/pca/pci/pcn/pcn24* parameter to be the value *none* or another point code value?
The value *none*
Another point code value
Enter the *rtrv-map* command.
Does the *rtrv-dstn* output show any point codes that are of the same type as the *pc/pca/pci/pcn/pcn24* parameter being removed?
No
Yes
Do any mated applications reference the EAGLE 5 ISS's point code?
Yes
No
Perform the "Removing a Destination Point Code" procedure to remove any point codes that are the same type as the *pc/pca/pci/pcn/pcn24* parameter value being removed
Perform the "Removing a Mated Application" procedure to remove any mated applications that reference the EAGLE 5 ISS's point code.
Enter the *rtrv-spc* command.
Is the point code to be specified in this procedure shown in the *rtrv-dstn* or *rtrv-spc* outputs, or shown as an EPC value in the *rtrv-pct* output?
Yes
No
The point codes specified in this procedure cannot be shown in the *rtrv-dstn* or *rtrv-spc* outputs, or shown as an EPC value in the *rtrv-pct* output. Choose a point code that is not shown in the *rtrv-dstn* or *rtrv-spc* outputs, or shown as an EPC value in the *rtrv-pct* output.
To Sheet 5

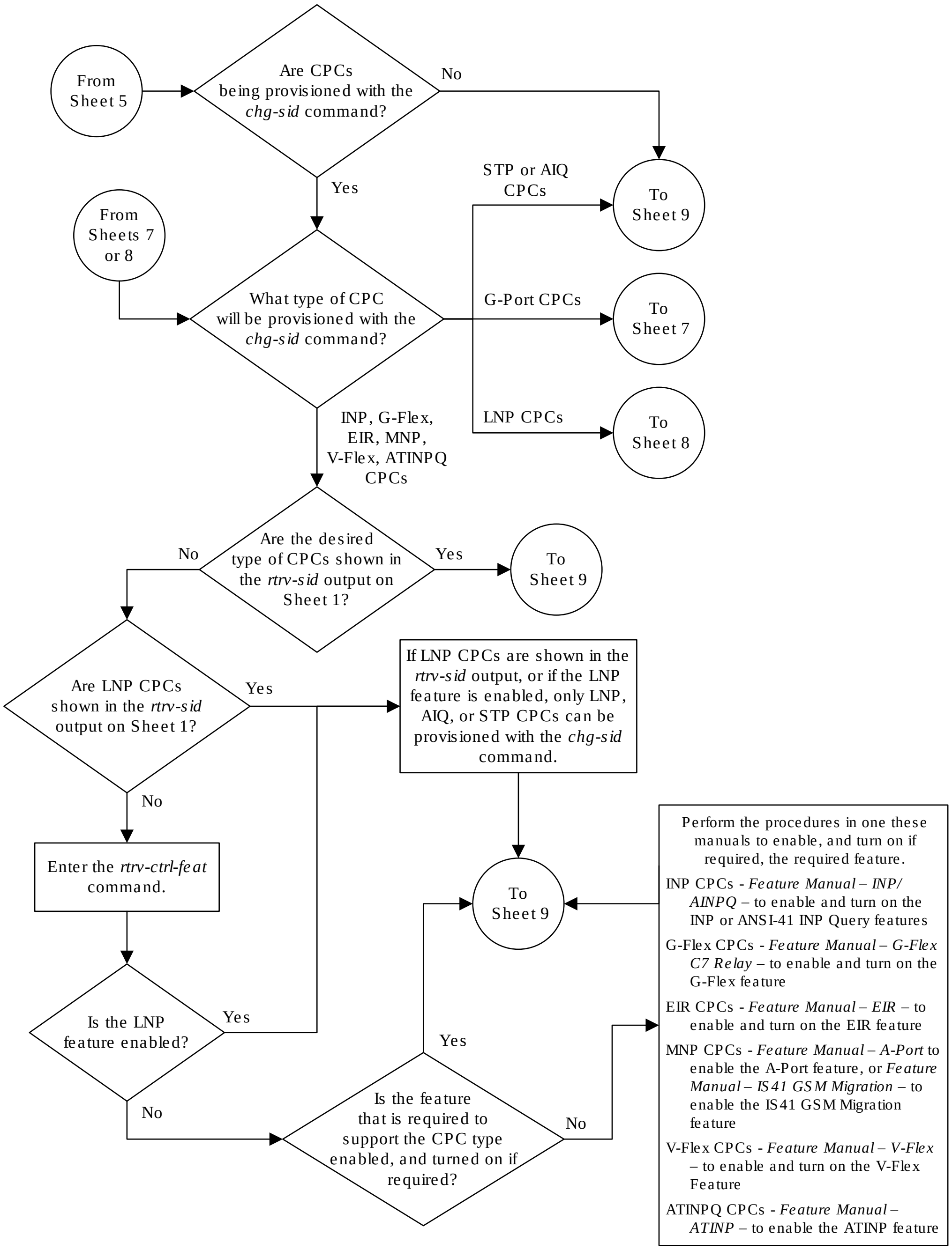
Sheet 3 of 11


From Sheet 3
Is the value that will be specified for the pc/pca/pci/pcn/pcn24 parameter to be the value none or another point code value?
The value none
Another point code value
Enter the rtrv-map command.
Does the rtrv-dstn output show any point codes that are of the same type as the pc/pca/pci/pcn/pcn24 parameter being removed?
No
Yes
Do any mated applications reference the EAGLE 5 ISS's point code?
Yes
No
Perform the "Removing a Destination Point Code" procedure to remove any point codes that are the same type as the pc/pca/pci/pcn/pcn24 parameter value being removed
Perform the "Removing a Mated Application" procedure to remove any mated applications that reference the EAGLE 5 ISS's point code.
Enter the rtrv-spc command.
Is the point code to be specified in this procedure shown in the rtrv-dstn or rtrv-spc outputs, or shown as an EPC value in the rtrv-pct output?
Yes
No
The point codes specified in this procedure cannot be shown in the rtrv-dstn or rtrv-spc outputs, or shown as an EPC value in the rtrv-pct output.
Choose a point code that is not shown in the rtrv-dstn or rtrv-spc outputs, or shown as an EPC value in the rtrv-pct output.
To Sheet 5

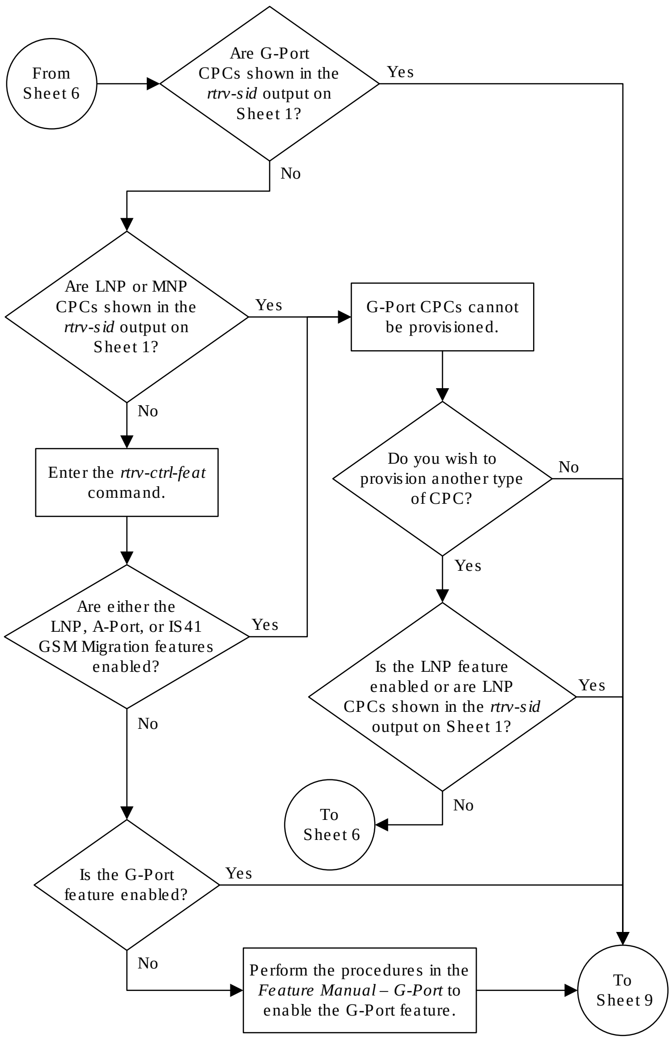
Sheet 4 of 11


From Sheets 3 or 4
Is the CLLI parameter value to be changed?
No
To Sheet 6
Yes
Was the rtrv-feat command executed on Sheet 2?
Yes
Is the E5IS feature on?
No
From Sheet 1
No
Yes
Enter the rtrv-feat command.
Enter the rtrv-eisopts command.
Is the FCMODE value for all the GPLs shown in the rtrv-eisopts output off?
No
On
What is the EISCOPY value?
Off
Yes
Enter the chg-eisopts:fcmode=off :fcgpl=all command.
Enter the chg-eisopts:eiscopy=off command.
Yes
Are only the clli or clli and pctype parameter values being changed?
To Sheet 9
No
To Sheet 6

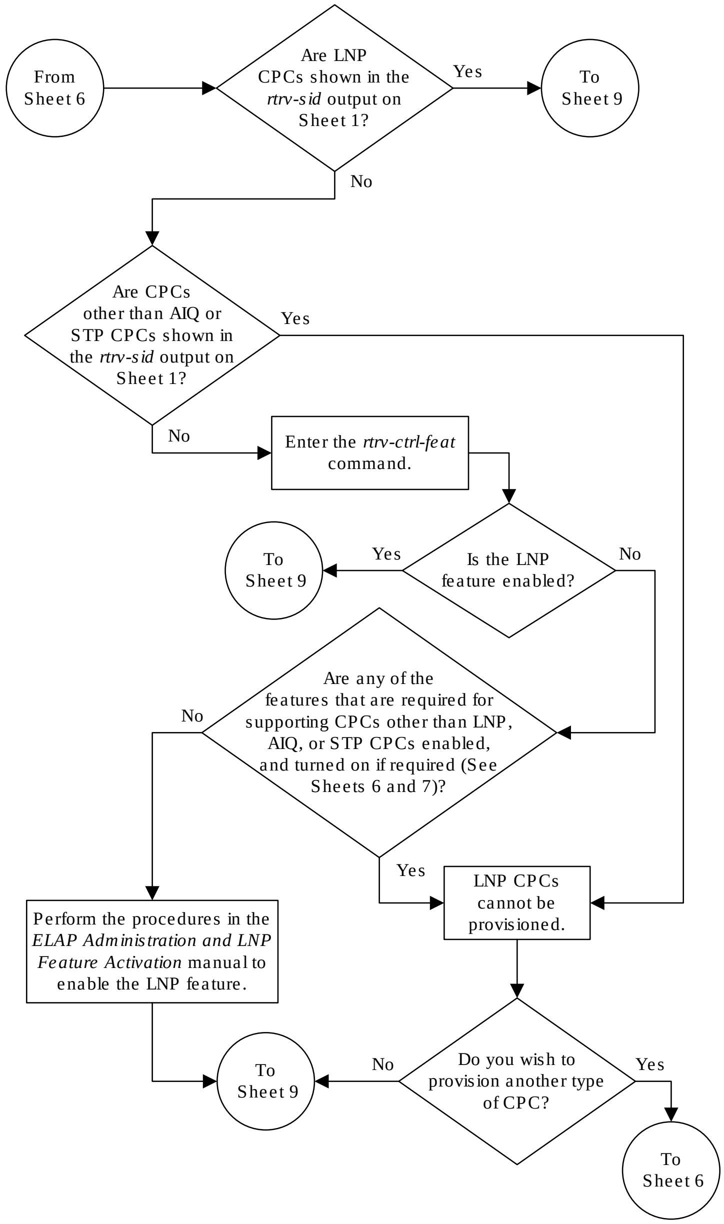
Sheet 5 of 11


From Sheet 5
Are CPCs being provisioned with the chg-sid command?
No
Yes
To Sheet 9
From Sheets 7 or 8
What type of CPC will be provisioned with the chg-sid command?
STP or AIQ CPCs
G-Port CPCs
To Sheet 7
LNP CPCs
To Sheet 8
INP, G-Flex, EIR, MNP, V-Flex, ATINPQ CPCs
Are the desired type of CPCs shown in the rtrv-sid output on Sheet 1?
No
Yes
To Sheet 9
Are LNP CPCs shown in the rtrv-sid output on Sheet 1?
Yes
If LNP CPCs are shown in the rtrv-sid output, or if the LNP feature is enabled, only LNP, AIQ, or STP CPCs can be provisioned with the chg-sid command.
No
Enter the rtrv-ctrl-feat command.
To Sheet 9
Perform the procedures in one these manuals to enable, and turn on if required, the required feature.
INP CPCs - Feature Manual – INP/ AINPQ – to enable and turn on the INP or ANSI-41 INP Query features
G-Flex CPCs - Feature Manual – G-Flex C7 Relay – to enable and turn on the G-Flex feature
EIR CPCs - Feature Manual – EIR – to enable and turn on the EIR feature
MNP CPCs - Feature Manual – A-Port to enable the A-Port feature, or Feature Manual – IS41 GSM Migration – to enable the IS41 GSM Migration feature
V-Flex CPCs - Feature Manual – V-Flex – to enable and turn on the V-Flex Feature
ATINPQ CPCs - Feature Manual – ATINP – to enable the ATINP feature
Is the LNP feature enabled?
Yes
No
Yes
Is the feature that is required to support the CPC type enabled, and turned on if required?
No

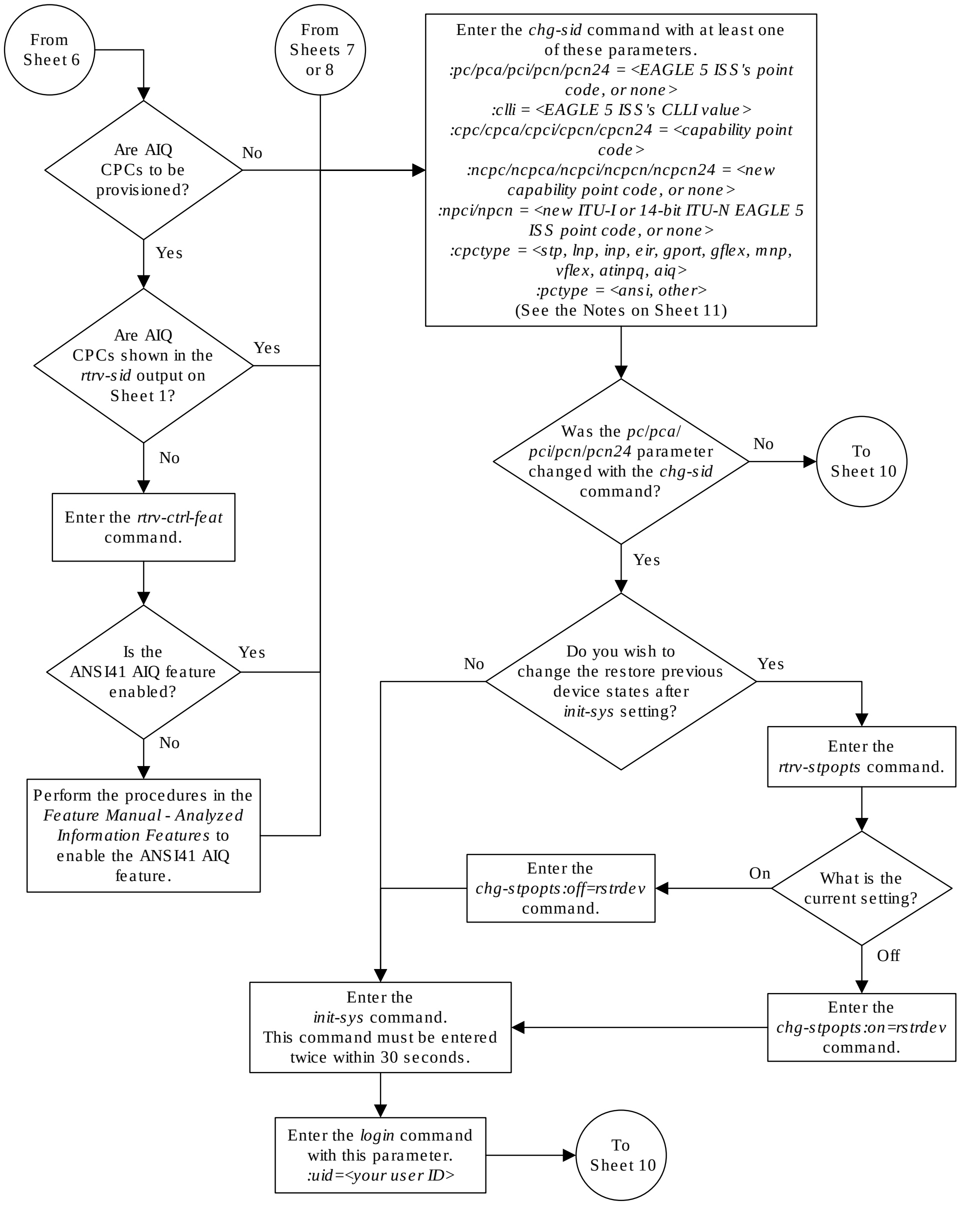
Sheet 6 of 11


From Sheet 6
Are G-Port CPCs shown in the rtrv-sid output on Sheet 1?
Yes
No
Are LNP or MNP CPCs shown in the rtrv-sid output on Sheet 1?
Yes
G-Port CPCs cannot be provisioned.
No
Enter the rtrv-ctrl-feat command.
Do you wish to provision another type of CPC?
No
Yes
Are either the LNP, A-Port, or IS41 GSM Migration features enabled?
Yes
Is the LNP feature enabled or are LNP CPCs shown in the rtrv-sid output on Sheet 1?
Yes
No
No
To Sheet 6
Is the G-Port feature enabled?
Yes
No
Perform the procedures in the Feature Manual – G-Port to enable the G-Port feature.
To Sheet 9

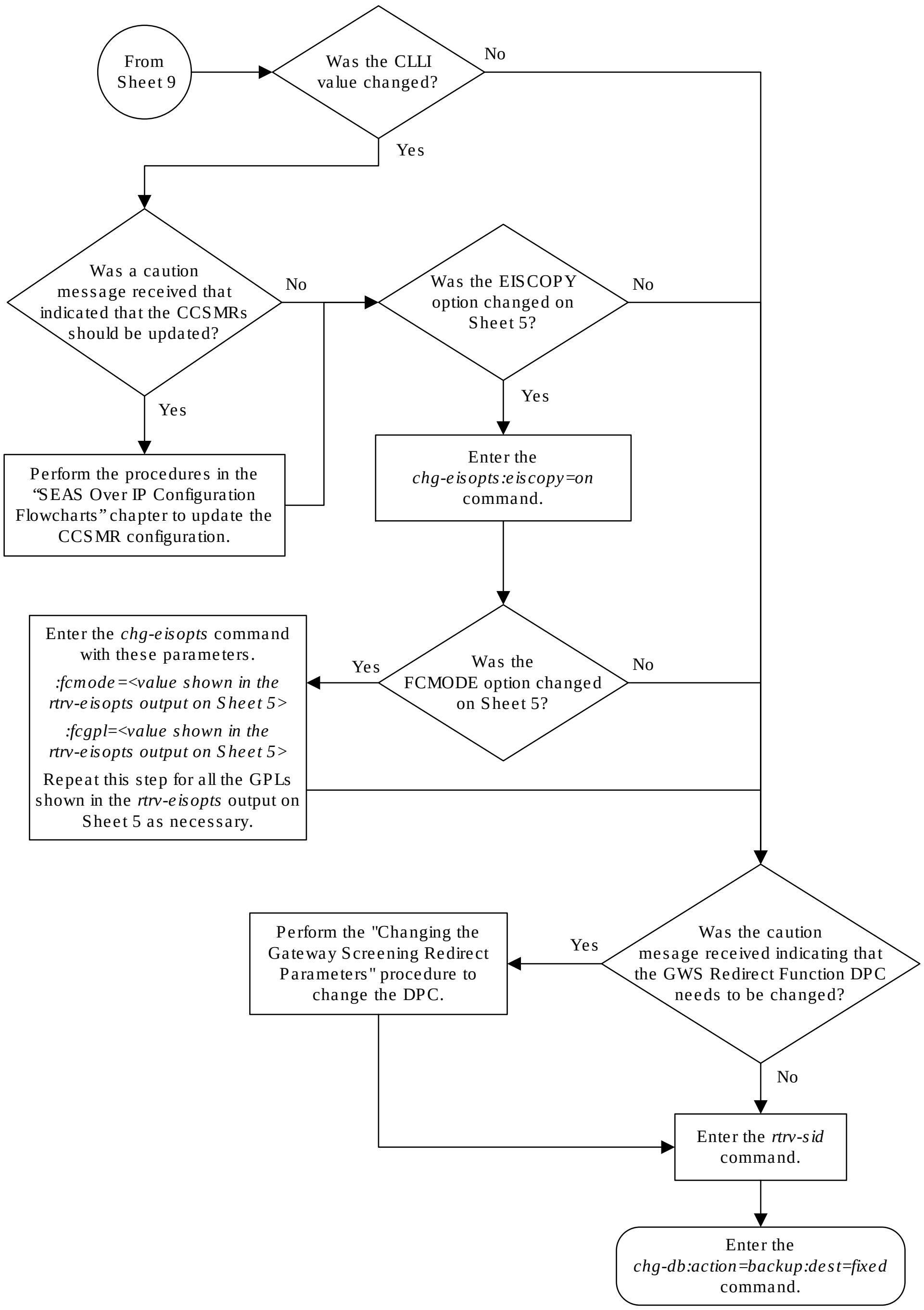
Sheet 7 of 11


From Sheet 6
Are LNP CPCs shown in the rtrv-sid output on Sheet 1?
Yes
To Sheet 9
No
Are CPCs other than AIQ or STP CPCs shown in the rtrv-sid output on Sheet 1?
Yes
No
Enter the rtrv-ctrl-feat command.
To Sheet 9
Yes
Is the LNP feature enabled?
No
Are any of the features that are required for supporting CPCs other than LNP, AIQ, or STP CPCs enabled, and turned on if required (See Sheets 6 and 7)?
No
Yes
LNP CPCs cannot be provisioned.
Perform the procedures in the ELAP Administration and LNP Feature Activation manual to enable the LNP feature.
To Sheet 9
No
Do you wish to provision another type of CPC?
Yes
To Sheet 6

Sheet 8 of 11


From Sheet 6
From Sheets 7 or 8
Are AIQ CPCs to be provisioned?
No
Yes
Are AIQ CPCs shown in the rtrv-sid output on Sheet 1?
Yes
No
Enter the rtrv-ctrl-feat command.
Is the ANSI41 AIQ feature enabled?
Yes
No
Perform the procedures in the Feature Manual - Analyzed Information Features to enable the ANSI41 AIQ feature.
Enter the chg-sid command with at least one of these parameters.
:pc/pca/pci/pcn/pcn24 = <EAGLE 5 ISS's point code, or none>
:clli = <EAGLE 5 ISS's CLLI value>
:cpc/cpca/cpci/cpcn/cpcn24 = <capability point code>
:ncpc/ncpca/ncpci/ncpcn/ncpcn24 = <new capability point code, or none>
:npci/npcn = <new ITU-I or 14-bit ITU-N EAGLE 5 ISS point code, or none>
:cpctype = <stp, lnp, inp, eir, gport, gflex, mnp, vflex, atinpq, aiq>
:pctype = <ansi, other>
(See the Notes on Sheet 11)
Was the pc/pca/pci/pcn/pcn24 parameter changed with the chg-sid command?
No
To Sheet 10
Yes
Do you wish to change the restore previous device states after init-sys setting?
No
Yes
Enter the rtrv-stpopts command.
What is the current setting?
On
Off
Enter the chg-stpopts:off=rstrdev command.
Enter the chg-stpopts:on=rstrdev command.
Enter the init-sys command. This command must be entered twice within 30 seconds.
Enter the login command with this parameter. :uid=<your user ID>
To Sheet 10

Sheet 9 of 11



Sheet 10 of 11

Notes:

1. The parameters *pc*/*pca*, *cpc*/*cpca*, and *ncpc*/*ncpca* require ANSI point code values.
2. The parameters *pci*, *npci*, *cpci*, and *ncpci* require ITU-I point code values.
3. The parameters *pcn*, *ncpn*, *cpcn*, and *ncpcn* require 14-bit ITU-N point code values.
4. The parameters *pcn24*, *cpcn24*, and *ncpcn24* require 24-bit ITU-N point code values.
5. The EAGLE 5 ISS can contain 14-bit ITU-N point codes or 24-bit ITU-N point codes, but not both at the same time.
6. For 14-bit ITU-N point code values, the format of the point code must match the format defined by the *NPCFMTI* parameter of the *rtrv-stpopts* output.
7. The point code values must be full point codes.
8. The *cpc* parameter must be specified with the *ncpc* parameter and the point code type of both parameters must be the same.
9. Either the *cpc* or *ncpc* parameter must be specified with the *cpctype* parameter.
10. The *ncpc* parameter value cannot be equal to the *cpc* or *pc* parameter values.
11. The *clli* parameter value cannot be *none* or assigned to a route.
12. If the *cpctype* parameter value is *lnp*, the point code values must be ANSI point codes.
13. If the *cpctype* parameter value is *inp*, the point code values must be either ITU-I, 14-bit ITU-N, or 24-bit ITU-N point codes.
14. If the *cpctype* parameter value is *eir*, the point code values must be either ITU-I, 14-bit ITU-N, or 24-bit ITU-N point codes.
15. If the *cpctype* parameter value is *gflex*, the point code values can be any point code type.
16. If the *cpctype* parameter value is *gport*, the point code values can be any point code type.
17. If the *cpctype* parameter value is *stp*, the point code values can be any point code type.
18. The EAGLE 5 ISS can contain a maximum of 96 capability point codes.
19. The *ncpc=none* parameter removes the specified capability point code.
20. The *ncpc=<point code value>* replaces the specified capability point code.
21. The *pc=none* parameter removes the point code of the specified point code type. This parameter cannot be specified if there are routes that have DPCs of the point code type specified by the *pc=none* parameter.
22. The *pctype* parameter specifies whether or not the ANSI point codes used by the EAGLE 5 ISS meet the ANSI standard (*pctype=ansi*) or not (*pctype=other*). This parameter does not apply to ITU international or ITU national point codes. See the "ANSI Point Codes" section in this chapter for information about entering ANSI point codes.
23. If you wish to specify the *pcn24* parameter with the *chg-sid* command and the *rtrv-sid* output shows the *PCN* field, the 14-bit ITU-N point code value, shown in the *PCN* field must be removed with the *pcn=none* parameter before the *pcn24* parameter value can be specified by the *chg-sid* command. Enter the *chg-sid* command with the *pcn=none* parameter, then re-enter the *chg-sid* command with the *pcn24* parameter. If no value is shown in the *PCN* field, specifying the *pcn=none* parameter is not necessary.
24. If you wish to specify the *pcn* parameter with the *chg-sid* command and the *rtrv-sid* output shows the *PCN24* field, the 24-bit ITU-N point code value, shown in the *PCN24* field must be removed with the *pcn24=none* parameter before the *pcn* parameter value can be specified by the *chg-sid* command. Enter the *chg-sid* command with the *pcn24=none* parameter, then re-enter the *chg-sid* command with the *pcn* parameter. If no value is shown in the *PCN24* field, specifying the *pcn24=none* parameter is not necessary.
25. The *npci=none* parameter removes the specified ITU-I point code.
26. The *npcn=none* parameter removes the specified 14-bit ITU-N point code.
27. The *npci=<point code value>* replaces the specified ITU-I point code.
28. The *npcn=<point code value>* replaces the specified 14-bit ITU-N point code.
29. The *npci/npcn* parameter values cannot be equal to any *cpc* or *pc* parameter values.
30. The *pci* parameter must be specified if the *npci* parameter is specified.
31. The *pcn* parameter must be specified if the *npcn* parameter is specified.
32. The new ITU-I or 14-bit ITU-N point code values (*npci*/*npcn*) must be the same type as the *pci*/*pcn* parameter value. For example, if the *pci* value is a non-spare point code, the *npci* value must be a non-spare point code. If the *pci* value is a spare point code, the *npci* value must be a spare point code.
33. If the *cpctype* parameter value is *mnp*, the point code values can be any point code type.
34. If the *cpctype* parameter value is *vflex*, the point code values can be any point code type.
35. If the *cpctype* parameter value is *atinpq* or *aiq*, the point code values must be either ANSI, ITU-I, or 14-bit ITU-N point codes.

Sheet 11 of 11

2.15 Cluster Routing and Management Diversity (CRMD)

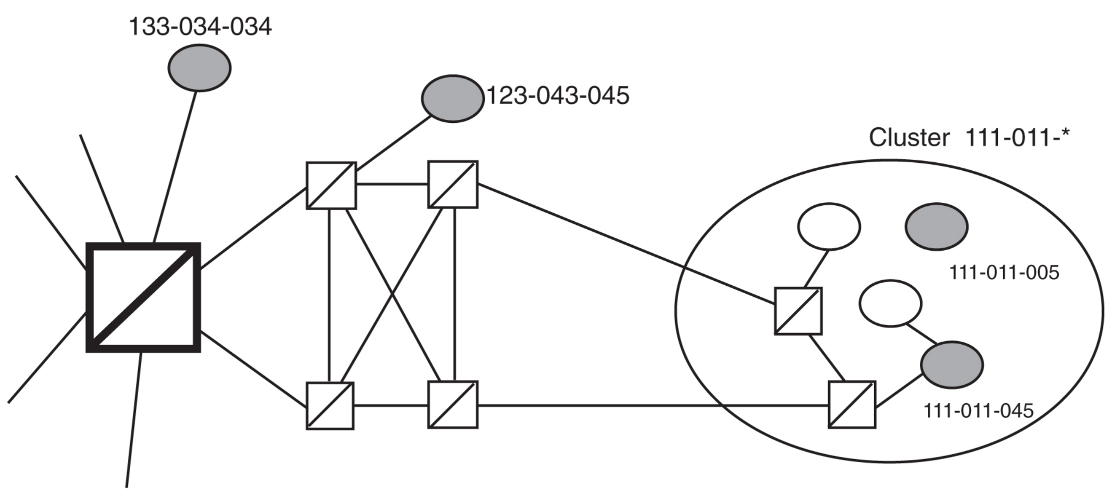
The Cluster Routing and Management Diversity feature eliminates the need for a full point code entry in the routing table to route to every signaling point in every network. The **Cluster** Routing and Management Diversity feature allows the EAGLE to configure one routeset to a entire cluster of destinations. This feature also allows the EAGLE to manage and switch traffic to more end nodes.

A cluster is defined as a group of signaling points whose point codes have identical values for the network and cluster fields of the point codes. A cluster entry in the routing table is shown with an asterisk (*) in the member field of the point code, for example, 111-011-*. With this feature, **ANSI** destination point codes can be specified as either a full point code, for example, 123-043-045, or as a cluster of signaling point codes, for example, 111-011-*.

> **Note:**
>
> Cluster entries can only be provisioned as ANSI destination point codes. Cluster entries cannot be provisioned for **ITU** international or ITU national destination point codes. The ANSI alias point code for an ITU international or ITU national destination point code must be a full point code.

The Cluster Routing and Management Diversity feature allows provisioning of clusters, as well as of full point codes that belong to the same cluster as destination point codes (Figure 2-21). The point codes 111-011-*, 111-011-005 and 111-011-045 entries can be provisioned. In Figure 2-21, the cluster destination point code 111-011-* represents all the point codes of the cluster except for point codes 111-011-005 and 111-011-045. Cluster entries in the destination point code table can also be used as a **DPC** for a route. A group of such routes with varying relative cost forms a routeset to a cluster, just like a routeset to a full point code.

Figure 2-21 Cluster Routing and Management Diversity



Exception Lists (X-lists)

An exception list for a cluster is a list of point codes in a cluster whose routes are more restricted than other routes to that cluster. The term “more restricted” is used when comparing the route status of a cluster member to the route status of the cluster. A `PROHIBITED` status is more restrictive than a `RESTRICTED` status, and a `RESTRICTED` status is more restrictive than an `ALLOWED` status.

This list contains point codes that are not assigned to any individual routeset, and the only routeset to that node is through a cluster routeset. The exception list is a dynamic list that changes when the status of the cluster routesets changes.

The EAGLE allows users to specify whether exception list entries need to be created on a per cluster basis. For each cluster, the user can specify an exception list exclusion indicator (**ELEI**) when configuring the cluster point code with the `ent-dstn` command. When the ELEI is `yes`, the EAGLE does not create exception list entries or remove any existing exception list entries for the given cluster. When the ELEI is `no`, the EAGLE creates and removes exception list entries. When the ELEI is `no`, it is not guaranteed that there will be space available to create each and every possible exception list entry for provisioned cluster entries. All such exception list entries must compete for available exception list space.

Exception list entries are stored as an extension of the Destination Point Code table. The Destination Point Code table can contain a maximum number of entries, as shown in Table 2-5. The EAGLE allows the user to specify the number of entries reserved for the exception list. Table 2-5 also shows the number of entries that can be reserved for the exception list and the number of entries that are reserved for configured destinations (the full, cluster point codes, and network routing point codes).

Table 2-5 Maximum Point Code Quantities

Feature Status	Maximum DPC Quantity	Number of Entries Reserved for the Exception List	Maximum Number of Full, Cluster, and Network Routing Point Codes
The 5000 Routes feature is off and 6000, 7000, 8000, or 10,000 routesets are not enabled	2500	500 - 2000	2500 minus the number of entries reserved for the exception list.
The 5000 Routes feature is on and 6000, 7000, 8000, or 10,000 routesets are not enabled	5500	500 - 5000	5500 minus the number of entries reserved for the exception list.
6000 routesets are enabled	6500	500 - 6000	6500 minus the number of entries reserved for the exception list.
7000 routesets are enabled	7500	500 - 6000	7500 minus the number of entries reserved for the exception list.
8000 routesets are enabled	8500	500 - 6000	8500 minus the number of entries reserved for the exception list.
10,000 routesets are enabled	10500	500 - 10000	10500 minus the number of entries reserved for the exception list.

The outputs of the `ent-dstn`, `dlt-dstn`, `chg-dstn`, and `rtrv-dstn` commands display this destination point code usage information.

- The number of configured full point codes
- The number of configured cluster point codes

- The number of configured network routing point codes
- The sum of configured destinations (full, network routing, and cluster point codes)
- The number of DPCs the EAGLE may contain (full, network routing, and cluster point codes). This number is the value of the `chg-stpopts` command's `mtpdpcq` parameter. The `mtpdpcq` parameter value is not always the maximum number of entries minus the number reserved for the exception list. This calculation determines the maximum number of DPCs the EAGLE may contain. The `mtpdpcq` parameter value of the `chg-stpopts` command determines the actual number of DPCs the EAGLE can have, and can be set to an amount less than the maximum.
- The number of entries reserved for exception list. This number is the value of the `chg-stpopts` command's `mtpxlq` parameter.
- The maximum number of alias point codes that can be in the EAGLE. The EAGLE can contain the quantities of alias point codes shown in Table 2-6 depending the features that are enabled or turned on.

Table 2-6 Maximum Alias Point Code Quantities

Feature Status	Maximum Alias Point Code Quantity
The 5000 Routes feature is off and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
The 5000 Routes feature is on and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
6000 routesets are enabled	12000
7000 routesets are enabled	8000
8000 routesets are enabled	8000
10,000 routesets are enabled	10000

- The number of alias point codes configured in the EAGLE.

Exception list entries have an expiration timer. There is a single EAGLE-wide expiration timer value for exception list entries. The exception list expiration timer, the size of the exception list, and the percentage of occupancy that generates a minor alarm can be configured with the `chg-stpopts` command. The values are shown in these fields of the `rtrv-stpopts` command output:

`MTPXLQ` = the maximum number of entries the exception list (x-list) can contain.

`MTPXLET` = the maximum amount of time the EAGLE will maintain an unreferenced exception list (x-list) entry

`MTPXLOT` = the exception list (x-list) occupancy threshold (in terms of percentage of space available). If this threshold is exceeded, the EAGLE raises a minor alarm. The percentage of occupancy refers to the number of exception list entries as compared to the maximum number of entries the exception list can hold. For example, if there are 1500 entries configured for the exception list and the exception list contains 1000 entries, the percentage of the exception list space being used is 66%. If this threshold is exceeded, the EAGLE raises a minor alarm.

The EAGLE raises a major alarm when the exception list becomes completely full and the EAGLE fails to create any more exception list entries.

`MTPDPCQ` = the maximum number of destination point codes that can be configured in the EAGLE.

The sum of the MTPDPCQ and MTPXLQ values (the maximum DPC quantity) cannot exceed the totals shown in Table 2-5 depending on the features that are enabled or turned on.

An exception list entry's timer is restarted when an exception list entry gets created, updated, or used for routing. This expiration timer (the mtpxlet parameter in the chg-stpopts command) can be set from a minimum of 20 minutes to a maximum of 24 hours. The default value for the expiration timer upon EAGLE start-up is 60 minutes. If the timer expires before it is restarted, the exception list entry is removed. The expiration timer allows the EAGLE to save resources, if the exception list entry is sitting idle for a long time.

An exception list entry can be created for three distinct set of conditions.

1. The first set of conditions creates exception list entries based on the status of the route (allowed, restricted, or prohibited), and these entries are marked as "exception list due to routing."
2. The EAGLE creates an exception list entry to maintain the congestion status of a non-provisioned, cluster-routed destination point code. These entries are marked "exception list due to congestion."
3. The EAGLE also creates an exception list to prohibit routing to a member of a cluster when circular routing to that member is detected. These exception list entries are marked "exception list due to circular routing."

An exception list entry for a particular cluster can be removed from the exception list when these conditions are met.

1. The status of all routes to the specified point code changes to a status that is less or equally restrictive than the corresponding status of the cluster's routes. This can happen for two reasons.
   - A dact-rstst command was issued.
   - A network management message (**TFA** or **TFR**) was received indicating the new status of the route to the specified point code.
2. The expiration timer for the exception list entry expires.
3. When a chg-dstn command is issued and changes the ELEI to yes for the cluster, and the EAGLE removes all exception list entries created for that cluster.
4. The chg-stpopts command was issued with the mtpxlet parameter, and the new value for the mtpxlet parameter was smaller than the original value. This command can change the allocation of routing table entries for the exception list. If the size of the exception list is reduced and the number of entries in the exception list is now greater than the new value of the mtpxlet parameter, the EAGLE will remove excess exception list entries at random.
5. When the user allows a circular routed "exception list due to circular routing" entry.
6. When congestion abates for an "exception list due to routing" entry.

Cluster Routing

When the EAGLE receives an **MSU** to route, the routing function looks for the MSU's destination point code as a full point code entry in the routing table. If found, the full point code entry is used to find the corresponding routeset and the outgoing route. If a full point code entry is not found, the routing function uses the destination point code's network and cluster values to find a cluster entry to which the destination point code belongs. If found, the cluster entry is used to find the corresponding routeset and the outgoing route. If neither a full point code entry or cluster point code entry is found, the EAGLE generates **UAM** `1004`, “MTP rcvd unknown DPC.”

Compatibility with Non-Cluster Routing Nodes

It is possible that not all of the nodes in the network that the EAGLE is operating in are cluster routing nodes. In such a situation, those nodes not doing cluster routing will interpret **TCx** messages, and apply them to each individual point code belonging to the concerned cluster. This may cause an inconsistency in the status records for exception-listed point codes in different nodes. In order to avoid this situation, the EAGLE takes these steps:

1. After broadcasting a **TCR** message for a cluster, the EAGLE stops any level 3 T8 timers running for exception-listed members of the cluster, and enables TFPs for the cluster’s exception-listed (prohibited) member point codes by stopping the level 3 T8 timer. This allows TFPs to be sent for prohibited members immediately after a TCR is broadcast.
2. After broadcasting a **TCA** message for a cluster, the EAGLE enables a one-time **TFR** for the cluster’s exception-listed (restricted) member point codes by stopping the level 3 T18 timer, and enables the TFPs for the cluster’s exception-listed (prohibited) member point codes by stopping the level 3 T8 timer. This allows TFPs to be sent for prohibited members, and TFRs for restricted members, immediately after a TCA is broadcast.

Cluster Management and the ITU Network

ITU SS7 networks do not use the concepts of clusters of point codes and cluster network management messages. The EAGLE does not generate TCx messages toward ITU nodes. When the EAGLE is acting as gateway between an ITU network and an ANSI network, during the broadcast phase of TCx messages, the EAGLE does not send TCx messages to adjacent ITU point codes. It is possible that messages may be lost in such a case. In order to reduce message loss and quickly notify the sending ITU node about the status, the EAGLE enables TFPs or TFRs immediately (with the level 3 T8 or T18 timers stopped) and relies on the TFPs or TFRs to convey the status information.

While sending response method network management messages in response to a received MSU, the EAGLE checks the MSU’s originating point code. If the MSU’s originating point code is an ITU point code, a TFx message is returned.

Cluster Management When the Cluster Routing Feature is Turned Off

The Cluster Routing and Management Diversity feature is an optional feature that is turned off by default. To use the Cluster Routing and Management Diversity feature, it must be turned on by entering the appropriate command. Once this feature is turned on, it cannot be turned off. If this feature is turned off, the EAGLE does not send any cluster management messages or allow cluster destination point codes to be added to the destination point code table. The EAGLE is capable of processing incoming cluster management messages, even though the feature is turned off. When a cluster management message is received, the EAGLE treats this message as though network management messages were received for each full point code, configured in the destination point code table, that belongs to that cluster.

Cluster Routing and Management Diversity Rules

These rules apply to the Cluster Routing and Management Diversity feature.

- If the provisioned number of exception list entries are already created, the EAGLE will not create any more exception list entries. The EAGLE raises an alarm in advance of such an occurrence, and pegs each occurrence of failure-to-create an exception list entry.

- All adjacent point codes for linksets must be full point codes.
- All entries in the remote point code table must be a full point code.
- The EAGLE maintains the congestion status of only 100 destinations, including full point codes and point codes to which cluster routing is performed.
- When the cluster routing feature is turned on, and the EAGLE receives an MSU and does not find a route with a full point code, a cluster route, or any other full point code route belonging to the cluster, the EAGLE will generate a TCP response.
- When the cluster routing feature is turned off, and the EAGLE receives an MSU and does not find a route with a full point code, the EAGLE will generate a TFP response.

When the EAGLE is used as an ITU-ANSI gateway STP.

- The EAGLE does not broadcast TCx messages toward the ITU nodes. Messages could be lost until the response method is initiated. It is recommended that the cluster routing feature not be turned on when the EAGLE is an ITU gateway STP.
- Cluster destination point codes cannot have ITU alias point codes.

All ANSI alias point codes specified for real ITU point codes are required to be full point codes.

The point code specified in the `ent-map` command must use a full point code, and that full point code must be in the routing table.

The point code specified in the `ent-gtt` and `ent-cspc` commands can use either a full point code or a cluster point code, but these point codes must be in the routing table.

The EAGLE allows cluster routing for subsequent global title (GTT) messages. The EAGLE also sends subsystem status messages to concerned point codes using a cluster route. The EAGLE does not generate MTP status messages for point codes that the EAGLE is routing clusters to, so all point codes in the mated application table must be full point codes.

Gateway screening verifies the concerned point code in TFx/**RSx** messages received by the EAGLE. Gateway screening passes a TFx/RSx message through the MTP-affected destination test, if the concerned point code has either a full point code route or a cluster route.

Gateway screening verifies the concerned point code in TCx/RCx messages received by the EAGLE. Gateway screening passes a TCx/RCx message through the MTP-affected destination test, if the concerned point code has either a cluster route for a concerned cluster or a member route for any of the members of the concerned cluster.

If a point code is in the routing table as an exception-listed point code and the user enters a command (`ent-dstn`) to configure that same point code as a full point code, the exception-listed point code attribute is changed to a full point code attribute, and the exception-list related information from the cluster entry is updated.

When a cluster destination point code is removed from the EAGLE’s database, all related exception-listed point codes of that cluster are removed.

The EAGLE implements these protocol features that are non-preferred options.

- The EAGLE broadcasts a TFP, when a full point code is prohibited and these conditions apply.

  - The corresponding cluster is not provisioned.
  - All other full point codes belonging to the same cluster are prohibited on the same route.
- The EAGLE responds with a TFP, when a message is received for an inaccessible point code and the corresponding cluster does not exist.
- Upon receiving a TCR message for a cluster that is not configured, the EAGLE marks all individually configured members of that cluster as restricted, and starts the RSR procedure for them.
- Upon receiving a TCP message for a cluster that is not provisioned, the EAGLE marks all individually configured members of that cluster as prohibited, and starts the RSP procedure for them.
- The EAGLE stops the level 3 T8 and T18 timers, after broadcasting a TCA for prohibited and restricted members of the clusters. These members can be exception-listed point codes or full point codes.
- The EAGLE stops the level 3 T8 timers after broadcasting a TCR for prohibited members of the clusters. These members can be exception-listed point codes or full point codes.

The route assigned to a full point code DPC cannot be removed from the database if that DPC is a member of a cluster point code in the database.

If a route assigned to a cluster point code is removed from the database, all routes to any members of that cluster are also removed from the database.

Cluster Routing and Management Diversity Example

This section shows an example of the Cluster Routing and Management Diversity feature, and lists the network events affecting the EAGLE. This example is based on Figure 2-22 and Table 2-7.

Figure 2-22 Cluster Management

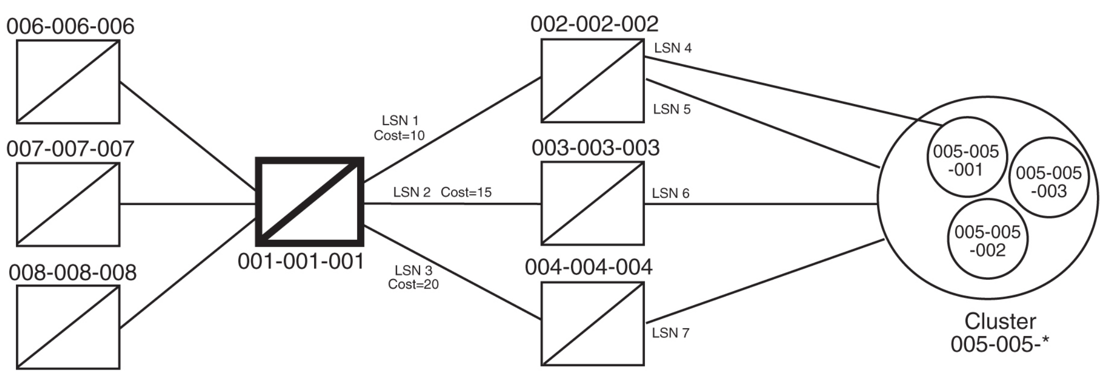


Table 2-7 Example Cluster Routing Information

	Route Table for Destination 005-005-001	Route Table for Cluster 005-005-*
1	**LSN** 1, Cost=10	LSN 1, Cost=10
2	LSN 2, Cost=15	LSN 2, Cost=15

Table 2-7 (Cont.) Example Cluster Routing Information

	Route Table for Destination 005-005-001	Route Table for Cluster 005-005-*
3	LSN 3, Cost=20	LSN 3, Cost=20

When the normal routes, linksets LSN 1 and LSN 2, become available, the EAGLE sends a preventive TFP for destination 005-005-001 and a preventive TCP for cluster 005-005-* to node 002-002-002, and starts routing messages to destination 005-005-001 and cluster 005-005-* using linkset LSN 1. The EAGLE broadcasts TFAs about destination 005-005-001 and TCAs about cluster 005-005-* to all other adjacent nodes.

1. When linkset LSN 4 fails, node 002-002-002 sends a TFP for destination 005-005-001 to the EAGLE. Linkset LSN 4 is prohibited from carrying traffic from the EAGLE to destination 005-005-001. The EAGLE stops using linkset LSN 1 to send traffic to destination 005-005-001, performs forced rerouting, starts level 3 timer T11 for destination 005-005-001, and starts using linkset LSN 2 to send messages to destination 005-005-001. The EAGLE generates preventive TFPs about destination 005-005-001 to node 002-002-003. The preventive TCP for cluster 005-005-* sent to node 002-002-002 remains in effect.
   When the level 3 timer T11 for destination 005-005-001 expires, TFRs are broadcast for destination 005-005-001 to nodes 004-004-004, 006-006-006, 007-007-007, and 008-008-008. Destination 005-005-001 is restricted.
2. When linkset LSN 5 fails, node 002-002-002 sends a TCP for cluster 005-005-* to the EAGLE. Linkset LSN 5 is prohibited from carrying traffic from the EAGLE to cluster 005-005-*. The EAGLE stops using linkset LSN 1 to send traffic to cluster 005-005-*, performs forced rerouting, starts the level 3 timer T11 for cluster 005-005-*, and starts using linkset LSN 2 to send messages to cluster 005-005-*. The EAGLE sends preventive TCPs for cluster 005-005-* on linkset LSN 2. The EAGLE sends a TCR for cluster 005-005-* on linkset LSN 1, to allow cluster 005-005-* and destination 005-005-001 to send messages back to the EAGLE on linkset LSN 1. When the level 3 timer T11 for cluster 005-005-* expires, the EAGLE sends a TCR for cluster 005-005-* to nodes 004-004-004, 006-006-006, 007-007-007, and 008-008-008. Cluster 005-005-* is restricted.
3. When linkset LSN 6 fails, node 003-003-003 sends a TCP for cluster 005-005-* to the EAGLE. The EAGLE performs forced rerouting, sends a preventive TFP for destination 005-005-001 and a TCP for destination 005-005-001 to node 004-004-004, and starts using linkset LSN 3 for sending messages to destination 005-005-001 and cluster 005-005-*.
4. When linkset LSN 7 fails, node 004-004-004 sends a TCP for cluster 005-005-* to EAGLE. The EAGLE cannot send traffic to either destination 005-005-001 or cluster 005-005-*. The EAGLE broadcasts TCPs for cluster 005-005-* to nodes 002-002-002, 003-003-003, 004-004-004, 006-006-006, 007-007-007, and 008-008-008. Cluster 005-005-* and destination 005-005-001 are inaccessible.
5. When linkset LSN 7 recovers, node 004-004-004 sends a TCA for cluster 005-005-* to the EAGLE. The EAGLE sends a preventive TCP for cluster 005-005-* to node 004-004-004, and starts using linkset LSN 3 to send traffic to cluster 005-005-*. The EAGLE sends a TCR for cluster 005-005-* to node 002-002-002. This allows cluster 005-005-* to send messages back to the EAGLE on linkset LSN 3. The EAGLE sends a preventive TCP for cluster 005-005-* to nodes

003-003-003 and 004-004-004. The EAGLE sends a TCR for cluster 005-005-* to nodes 006-006-006, 007-007-007, and 008-008-008. The EAGLE enables response method for destination 005-005-001, and starts a routeset test for destination 005-005-001 on linkset LSN 3. Cluster 005-005-* is restricted.

6. When linkset LSN 6 recovers, node 003-003-003 sends a TCA for cluster 005-005-* to the EAGLE. The EAGLE performs controlled rerouting on cluster 005-005-*, sends a preventive TCP for cluster 005-005-* to node 003-003-003, and starts using linkset LSN 2 to send traffic to cluster 005-005-*. The EAGLE sends a TCR for cluster 005-005-* to node 004-004-004. The EAGLE starts a routeset test for destination 005-005-001 on linkset LSN 2.
7. When linkset LSN 5 recovers, node 002-002-002 sends a TCA for cluster 005-005-* to the EAGLE. The EAGLE performs controlled rerouting, and starts using linkset LSN 1 to send traffic to cluster 005-005-*. The EAGLE sends a preventive TCP for cluster 005-005-* to node 002-002-002. The EAGLE broadcasts a TCA for cluster 005-005-* to nodes 003-003-003, 004-004-004, 006-006-006, 007-007-007, and 008-008-008. The EAGLE enables response method for destination 005-005-001, and starts a routeset test for destination 005-005-001 on linkset LSN 1. Cluster 005-005-* is allowed.
8. In response to the routeset test, node 004-004-004 sends a TFA for destination 005-005-001 to the EAGLE. The EAGLE performs controlled rerouting, and starts using linkset LSN 3 to send traffic to destination 005-005-001. The EAGLE sends a preventive TFP for destination 005-005-001 to nodes 003-003-003 and 004-004-004. The EAGLE sends a TFR for destination 005-005-001 to node 002-002-002 that allows destination 005-005-001 to send messages back to the EAGLE on linkset LSN 1. The EAGLE broadcasts a TFR for destination 005-005-001 to nodes 006-006-006, 007-007-007, and 008-008-008. Destination 005-005-001 is restricted.
9. In response to the routeset test, node 003-003-003 sends a TFA for destination 005-005-001 to the EAGLE. The EAGLE performs controlled rerouting and starts using linkset LSN 2 to send traffic to destination 005-005-001. The EAGLE sends a preventive TFP for destination 005-005-001 to node 003-003-003. The EAGLE sends a TFR for destination 005-005-001 to node 004-004-004.
10. In response to the routeset test, node 002-002-002 sends a TFA for destination 005-005-001 to the EAGLE. The EAGLE performs controlled rerouting, and starts using linkset LSN 1 to send traffic to destination 005-005-001. The EAGLE sends a preventive TFP for destination 005-005-001 to node 002-002-002. The EAGLE sends a TFA for destination 005-005-001 to nodes 003-003-003, 004-004-004, 006-006-006, 007-007-007, and 008-008-008. Destination 005-005-001 is allowed.

Home Cluster Example

Figure 2-23 Home Cluster Example

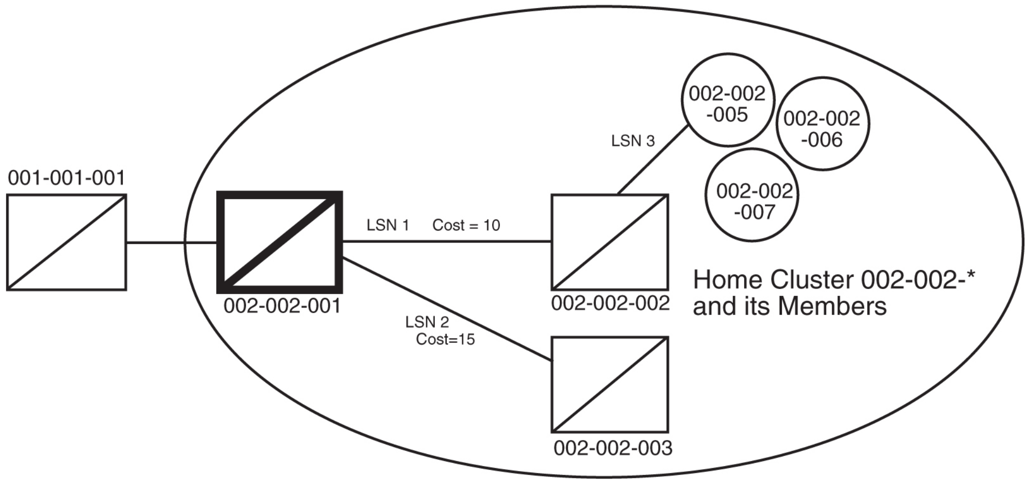


Table 2-8 Home Cluster Routing Information

	Route table for Destination 002-002-005	Route table for cluster 002-002-*
1	LSN 1, Cost=10	LSN 1, Cost=10
2	LSN 2, Cost=15	LSN 2, Cost=15

A home cluster is a cluster point code that contains either the true point code or any capability point code of the EAGLE. For example, if the EAGLE's true point code or any capability point code is 002-002-001 and a cluster 002-002-* is configured, then the cluster 002-002-* is a home cluster.

Provisioning a home cluster causes a profound impact on network management, regarding the home cluster as well as members of the cluster. These impacts are:

- Because the EAGLE is one of the accessible members of the home cluster, the EAGLE never transmits TCP or TCR messages regarding the home cluster, except for these:
  - Preventive TCP – when starting to route to the cluster through an adjacent node
  - Broadcast TCR – when the EAGLE starts routing on an alternate route for the entire cluster
  - Back Routing TCR – to allow adjacent nodes on normal routes to route through the EAGLE, when the cluster is not accessible on the normal route
  - Broadcast TCP – when the cluster (except the EAGLE itself) becomes inaccessible
- If individual members are provisioned for the home cluster, the EAGLE properly generates network management messages for these nodes, except that no TFRs can be sent from those members being routed on the alternate route to the EAGLE.

- Network management replies to the routeset test, and the response method generates the correct network management messages for the home cluster, its members, and unprovisioned member point codes.
- When the entire home cluster is being routed on the alternate route, the EAGLE generates a full point code response method TFR reply. In such a case, the EAGLE generates only one TFR for the very first member of the cluster for which MSU is received on each signaling link to that cluster.
- When the home cluster is inaccessible, the EAGLE generates one response TFP, at an interval equal to the value of the level 3 timer T8 for the members of the home cluster. If the EAGLE keeps receiving traffic for the home cluster, the EAGLE sends response TFPs for all members of the cluster.

This makes network management unreliable for the home cluster and its members.

When the normal routes, linksets LSN 1 and LSN 2, become available, the EAGLE sends a preventive TFP for destination 002-002-005 to node 002-002-002, and starts sending messages to destination 002-002-005 and cluster 002-002-* using linkset LSN 1. No preventive messages are sent for cluster 002-002-*. The EAGLE broadcasts a TFA for destination 002-002-005 and a TCA for cluster 002-002-* to all other adjacent nodes.

1. Node 002-002-002 sends an MSU containing the destination point code 002-002-006 on linkset LSN 1. The EAGLE responds with a response preventive TFP for destination 002-002-006 to node 002-002-002.
2. When linkset LSN 3 fails, node 002-002-002 sends a TFP for destination 002-002-005 to the EAGLE. The EAGLE stops using linkset LSN 1 to send traffic to destination 002-002-005, performs forced rerouting, starts the level 3 timer T11 for destination 002-002-005, and starts using linkset LSN 2 to send traffic to destination 002-002-005. The EAGLE generates a preventive TFP for destination 002-002-005 to node 002-002-003. When the level 3 timer T11 for destination 002-002-005 expires, TFRs for destination 002-002-005 are broadcast to nodes 002-002-003 and 001-001-001. Destination 002-002-005 is restricted.
3. Node 002-002-002 sends an MSU containing the destination point code 002-002-005 on linkset LSN 1. The EAGLE responds with a response preventive TFP for destination 002-002-005 to node 002-002-002, because no member of a home cluster is allowed to route messages back to the EAGLE.
4. When linkset LSN 1 fails, the EAGLE stops using linkset LSN 1 to send traffic to cluster 002-002-*, performs forced rerouting, starts the level 3 timer T11 for cluster 002-002-*, and starts using linkset LSN 2 to send traffic to cluster 002-002-*. Cluster 002-002-* is restricted. No preventive or broadcast messages are sent, and no member of the cluster is allowed to send messages back to the EAGLE.
5. Node 001-001-001 sends an MSU containing the destination point code 002-002-006. The EAGLE responds with a response TFR for destination 002-002-006 to node 001-001-001. The MSU is routed on linkset LSN 2.
6. Node 001-001-001 sends an MSU containing the destination point code 002-002-005. The EAGLE responds with a response TFR for destination 002-002-005 to node 001-001-001. The MSU is routed on linkset LSN 2.
7. Node 001-001-001 sends an MSU containing the destination point code 002-002-007 and receives no response. The MSU is routed on linkset LSN 2.
8. When linkset LSN 2 fails, destination 002-002-005 and cluster 002-002-* are prohibited. The EAGLE broadcasts a TFP for destination 002-002-005 to node 001-001-001.

9. Node 001-001-001 sends an MSU containing the destination point code 002-002-007. The EAGLE responds with a TFP for destination 002-002-007 to node 001-001-001, and starts the level 3 timer T8 for cluster 002-002-*.
10. Node 001-001-001 sends an MSU containing the destination point code 002-002-006, and receives no response until the level 3 timer T8 expires.
11. Node 001-001-001 sends an MSU containing the destination point code 002-002-005. The EAGLE responds with a TFP for destination 002-002-005 to node 001-001-001, and starts the level 3 timer T8 for destination 002-002-005.
12. Node 001-001-001 sends an MSU containing the destination point code 002-002-006. After the level 3 timer T8 for cluster 002-002-* expires, the EAGLE responds with a TFP for destination 002-002-006 to node 001-001-001, and starts the level 3 timer T8 for cluster 002-002-*.

2.16 Nested Cluster Routing

When a node is switching traffic to remote (non-adjacent) nodes, it is possible that an **STP** is using at least one route that is different from the other members of a cluster. Typically, this occurs when the node is directly connected to the member of a cluster, such as when an **STP** has A-links or E-links that are connected to a member. The nested cluster routing feature provides a mechanism that allows both cluster and member routes to be provisioned in the same cluster.

Nested Clusters and Cluster Members

The cluster routing and management feature requires that routes to a cluster and members of that cluster be in the same routeset. With the nested cluster routing feature, however, users can have certain members of the provisioned cluster with different full point code routesets. This different routeset may be totally different, partially different, or exactly the same.

With the nested cluster routing feature, routes to these members can be changed, deleted, or added. Deletion of a full point code route entry within a cluster will result in the member using the cluster entry for routing. Deletion of a cluster route entry will not delete the full point code route entry. This holds true even if the full point code entry and the cluster have the same route.

The **EAGLE** sends cluster network management messages (**TCA**, **TCR**, **TCP**) based on the least restrictive of the cluster's routeset status, and the routeset status of any full point code entries within the cluster.

The nested cluster routing feature provides a new routing model. The **EAGLE** allows several routing models. Table 2-9 describes coupling between the cluster and its members. Coupling describes the relationship between the cluster and member routes.

Table 2-9 Routing Models

System Routing Model	Characteristics	Issues and Resolution
Full Point Code Routing (**FPR**) No coupling	The **EAGLE** behaves as a full point code router when the **Cluster** Routing and Management Diversity feature is off. Only full point code destinations are provisioned. The **EAGLE** never generates **TCx** messages concerning clusters of provisioned members. Received **TCx** messages are applied to all members of the concerned cluster.	No issues. There is no coupling between cluster status and member statuses due to the lack of clusters.
Cluster Routing (**CR**) No coupling **NCAI**=No	With the **Cluster** Routing and Management Diversity feature on, the **EAGLE** allows the provisioning of cluster destinations. For cluster destinations, only cluster destinations are provisioned. The **EAGLE** generates **TCx** messages only for provisioned cluster destinations. All received **TCx** messages are applied to concerned cluster entry, if it exists. Otherwise, it is applied to all individual members.	No issues. There is no coupling between cluster status and member status due to the lack of members belonging to provisioned cluster.
Cluster Routing and Management Diversity (**CRMD**) Full coupling **NCAI**=No	In this mode, the **EAGLE** allows provisioning of clusters as well as members of same clusters. Here cluster and member have the same routeset, and they are fully coupled. All **TCx** messages are applied to members, and **TCx** messages generated by the **EAGLE** reflect member status. In this mode, the member status cannot be less restrictive than the cluster.	No issues regarding network management message generation and processing. **Cluster** and members cannot have a different routeset, and thus E-links cannot be provisioned for members of a cluster.

Table 2-9 (Cont.) Routing Models

System Routing Model	Characteristics	Issues and Resolution
Nested **Cluster** Routing No coupling **NCAI**=Yes	In this mode, if the `ncai` parameter is `yes` (provided both the nested cluster routing and the **Cluster** Routing and Management Diversity features are on), the user can enter a cluster routeset, then enter a different routeset for a member of that cluster. In this case, member routeset status can be less restricted than cluster routeset status.	There is an issue regarding broadcasting network management messages. Because members can be less restricted than the cluster, the broadcast of cluster messages (**TCA**, **TCR**, **TCP**) is based on the least restrictive of the following: • The cluster's routeset status. • The routeset status of any full point code entries within the cluster. • Also, when the `ncai` parameter is `yes`, the **EAGLE** does not generate preventive **TCP** messages.

Administration

The nested cluster routing feature is provisioned using the `ncai` parameter of either the `ent-dstn` or `chg-dstn` commands. The ncai parameter can only be specified for cluster point codes.

In order to specify the `ncai` parameter, both the **Cluster** Routing and Management Diversity and the nested cluster routing features must be on. If the `ncai` parameter is `yes`, the **EAGLE** allows certain members of the provisioned cluster to have a different full point code routeset.

If the `ncai` parameter is `no`, standard command-handler rules apply (any full point code routeset within a cluster must have the same routeset as the cluster). If `ncai` parameter is `yes`, new command-handler rules apply (full point code routeset can be different from the cluster routeset). Figure 2-24 provides an example of provisioning a nested cluster and its associated members.

Nested Cluster Routing Rules of Operations

The following rules apply to nested clusters (cluster entries with the `ncai` parameter set to `yes`):

1. The **EAGLE** allows the user to enter a full point code routeset entry even if the point code is a member of a cluster that has a different routeset. For example, in Figure 2-24, the provisioned member 5-5-1 has a different routeset than the cluster's routeset.
2. When the **EAGLE** broadcasts network management messages relating to the cluster, the **EAGLE** uses the least restricted of the following to determine which cluster message (**TCA**, **TCR**, **TCP**) to send:
   - The cluster's routeset status
   - The routeset status of any full point code entries within the cluster

For example, in Figure 2-24, if linkset **LSB** fails, a **TCP** message for cluster 5-5-* is not broadcast because the least restrictive status of provisioned member 5-5-1 is allowed.

3. The **EAGLE** does not send preventive **TCPs** when it begins routing toward a nested cluster. The **EAGLE** sends response-method preventive **TFPs** if it receives an **MSU** and there is danger of circular routing. For example, in Figure 2-24, the **EAGLE** does not send a preventive **TCP** for cluster 5-5-* when routing to cluster 5-5-* over linkset **LSB**. However, if the **EAGLE** receives an **MSU** on linkset **LSB** destined for node 5-5-2, the **EAGLE** discards the **MSU** and sends a **TFP** to node B concerning node 5-5-2.

   Note:

   The **EAGLE** will still send preventive **TFPs** when it starts routing toward a full point code member of a nested cluster.

4. The **EAGLE** replies to **RCx** cluster routeset test messages, using the less restrictive routeset status as indicated in rule #2.
5. The **EAGLE** replies to **RSx** full point code routeset messages, using the full point code's routeset status and the danger of circular routing.
6. Response method **TFP** or **TFR** is used when the cluster destination is more restrictive than a full point code member. The modified **TFP** response method will send no more than one **TFP** per cluster member during the time period defined by the level 3 T8 timer. The modified **TFR** response method sends no more than one response **TFR** per cluster member.

Nested Cluster Routing Example

Figure 2-24 provide an example of nested cluster routing. Table 2-10 and Table 2-11 show the routing tables for the cluster point code and one of the members of the cluster point code. Table 2-12 shows what actions the **EAGLE** takes when the linksets in a nested cluster configuration fail and recover. The actions in Table 2-12 are based on the example nested cluster routing configuration shown in Figure 2-24.

Figure 2-24 Nested Cluster Routing Sample Configuration

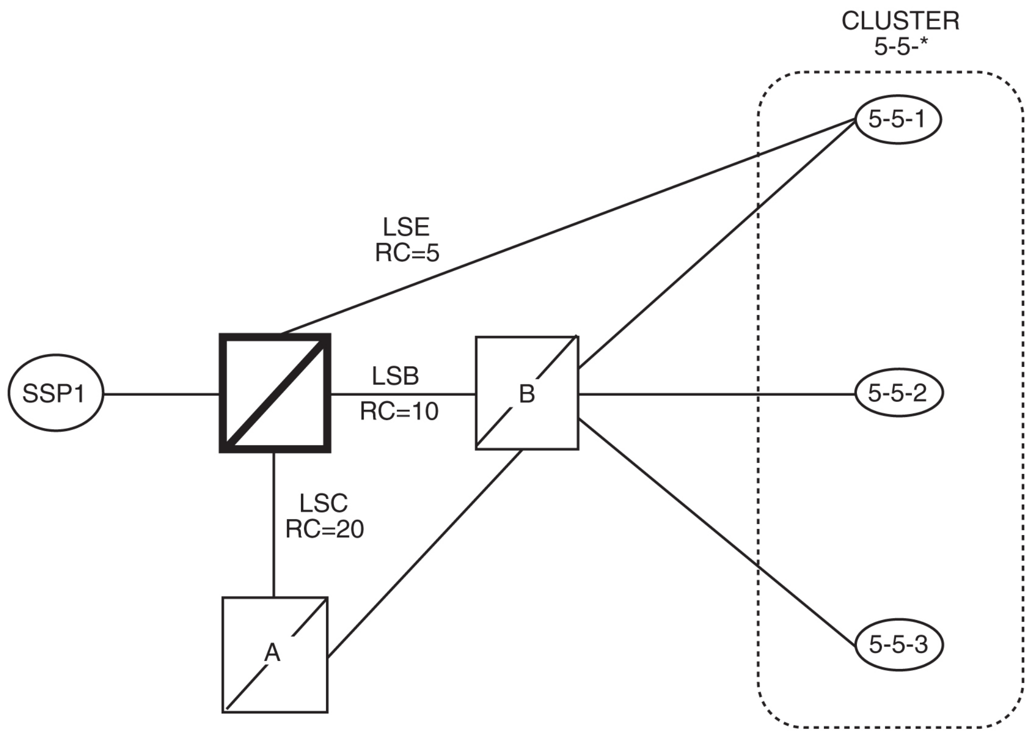


Table 2-10 Routing Table for Nested Cluster 5-5-*

Linkset Name	Route DPC	Cost Value of the Route
LSB	5-5-*	10
LSC	5-5-*	20

Table 2-11 Routing Table for Full Point Code Member 5-5-1

Linkset Name	Route DPC	Cost Value of the Route
LSE	5-5-1	5
LSB	5-5-1	10
LSC	5-5-1	20

Table 2-12 Example of Nested Cluster Routing Failure and Recovery Actions

Event	Action
All linksets are up and all routes are available.	The **EAGLE** does not send a preventive **TCP** for cluster 5-5-* to node B because cluster 5-5-* is a nested cluster. Messages are routed to **SSP** 5-5-1 using linkset **LSE** and to cluster 5-5-* using linkset **LSB**. The **EAGLE** broadcasts **TCAs** concerning cluster 5-5-* to nodes **SSP1**, **SSP** 5-5-1, node A, and node B.

Table 2-12 (Cont.) Example of Nested Cluster Routing Failure and Recovery Actions

Event	Action
The linkset between node B and **SSP** 5-5-2 fails. Node B sends a **TFP** concerning **SSP** 5-5-2.	The **EAGLE** creates an x-list entry for point code 5-5-2 and marks it prohibited on linkset **LSB**. The **EAGLE** broadcasts **TFPs** to **SSP1**, **SSP** 5-5-1 and node A and sends response method **TFP** concerning point code 5-5-2. The **EAGLE** starts an **RSP** for **SSP** 5-5-2 on linkset **LSB**.
The linkset between node B and **SSP** 5-5-1 fails. Node B sends a **TFP** for **SSP** 5-5-1 to the **EAGLE**.	The **EAGLE** marks full point code 5-5-1 as prohibited on linkset **LSB**. The **EAGLE** routes the traffic to **SSP** 5-5-1 using linkset **LSE**. The **EAGLE** starts an **RSP** for **SSP** 5-5-1 on linkset **LSB**.
The linkset between node B and **SSP** 5-5-2 recovers, and node B sends a **TFA** for **SSP** 5-5-2 to the **EAGLE**.	The **EAGLE** removes point code 5-5-2 from the exception list. The status of linkset **LSB** is changed from prohibited to allowed. Traffic is routed to **SSP** 5-5-2 using linkset **LSB**. The **EAGLE** broadcasts a **TFA** concerning **SSP** 5-5-2 to **SSP1**, **SSP** 5-5-1 and node A. The **EAGLE** sends a preventive **TFP** concerning **SSP** 5-5-2 to node B.
The linkset between node B and **SSP** 5-5-1 recovers, and node B sends a **TFA** concerning **SSP** 5-5-1 to the **EAGLE**.	The **EAGLE** marks full point code 5-5-1 as allowed on linkset **LSB**.
Linkset **LSB** fails.	The **EAGLE** stops using linkset **LSB** to send traffic to cluster 5-5-*. Linkset **LSB** is marked prohibited, forced rerouting is performed, level 3 timer T11 for cluster 5-5-* is started, and starts using linkset **LSC** to send traffic to cluster 5-5-*. The **EAGLE** marks cluster 5-5-* restricted on linkset **LSC** for all members of cluster 5-5-* except full point code 5-5-1. When level 3 timer T11 expires, a **TFR** response method is sent for all members of cluster 5-5-* except full point code 5-5-1.
SSP1 sends an **MSU** with **DPC**=5-5-2.	The **EAGLE** responds with **TFR** concerning **SSP** 5-5-2 to **SSP1**. The **MSU** is routed on linkset **LSC**.
SSP1 sends an **MSU** with **DPC**=5-5-1.	The **EAGLE** routes the **MSU** to **SSP** 5-5-1 using linkset **LSE**.
Linkset **LSB** recovers.	The **EAGLE** stops using linkset **LSC** to send traffic to cluster 5-5-*, performs controlling rerouting on cluster 5-5-*, marks cluster 5-5-* as allowed on linkset **LSB**, and starts routing traffic to cluster 5-5-* using linkset **LSB**.
The **SSP** sends a routeset test (**RSR**) concerning **SSP** 5-5-2 to the **EAGLE**.	The **EAGLE** responds with a **TFA** concerning **SSP** 5-5-2.

Table 2-12 (Cont.) Example of Nested Cluster Routing Failure and Recovery Actions

Event	Action
Linkset **LSC** fails.	The **EAGLE** stops using linkset **LSC** to send traffic to cluster 5-5-* or full point code 5-5-1, and marks cluster 5-5-* and full point code 5-5-1 as prohibited on linkset **LSC**.
Linkset **LSC** recovers.	The **EAGLE** marks cluster 5-5-* and full point code 5-5-1 as allowed on linkset **LSC**.
Linkset **LSE** fails.	The **EAGLE** stops using linkset **LSE** to send traffic to **SSP**-5-5-1, marks **SSP** 5-5-1 as prohibited on linkset **LSE**, performs forced rerouting, starts level 3 timer T11 concerning **SSP** 5-5-1, sends preventive **TFP** concerning **SSP** 5-5-1 to node B, and starts using linkset **LSB** to send traffic to full point code 5-5-1. The **EAGLE** marks full point code 5-5-1 as restricted on linkset **LSB**. When level 3 timer T11 expires, a **TFR** concerning **SSP** 5-5-1 is sent to **SSP1** and node A.
SSP1 sends an **MSU** with the **DPC** 5-5-2.	The **EAGLE** routes the **MSU** to **SSP** 5-5-2 using linkset **LSB**.
SSP1 sends an **MSU** with the **DPC** 5-5-1.	The **EAGLE** responds with a **TFR** concerning **SSP** 5-5-1 to **SSP1**. The **MSU** is routed to **SSP** 5-5-1 using linkset **LSB**.
Linkset **LSE** recovers.	The **EAGLE** stops using linkset **LSB** to send traffic to **SSP** 5-5-1, performs controlling rerouting on full point code 5-5-1, marks full point code 5-5-1 as allowed on linkset **LSE**, and starts routing traffic to full point code 5-5-1 using linkset **LSE**. The **EAGLE** broadcasts a **TFA** for **SSP** 5-5-1 to **SSP1**, node A, and node B.

Limitations of the Nested Cluster Routing Feature

The **EAGLE** only supports a maximum of 200 nested cluster destinations. This limit does not apply to non-nested clusters (clusters with the `ncai` parameter set to `no`).

If a cluster is more restricted than a member, the **EAGLE** broadcasts the status of the least restricted member, and relies on response method for members of the cluster that do not have a full point code entry.

The **EAGLE** does not broadcast preventive **TCPs** for nested cluster destinations. Because the **EAGLE** does not send preventive **TCPs** when it begins routing toward a nested cluster, circular routing can occur. The **EAGLE** sends response method **TFPs** if it receives an **MSU** when there is a danger of circular routing.

2.17 Adding a Cluster Point Code

This procedure is used to add a cluster point code for the **Cluster** Routing and Management Diversity (**CRMD**) feature, and nested cluster point codes for the nested cluster routing feature to the database, using the `ent-dstn` command.

To change the attributes of an existing cluster point code, go to the Changing the Attributes of a Cluster Point Code procedure.

> **Note:**
>
> Cluster entries can only be provisioned as ANSI destination point codes. Cluster entries cannot be provisioned for ITU international or ITU national destination point codes, and cannot be provisioned as a proxy point code. The ANSI alias point code for an ITU international or ITU national destination point code must be a full point code. An ANSI private point code must be a full point code.

To remove a cluster point code from the database, go to the Removing a Destination Point Code procedure.

The Cluster Routing and Management Diversity feature must be turned on.

The `ent-dstn` command uses these parameters:

`:dpc/dpca` – The destination point code being added to the database.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE.

> **Note:**
>
> Alias point codes (`aliasi`/`aliasn`/`aliasn24`) and secondary point codes (`spc`/`spca`) cannot be specified for a cluster point code.

`:clli` – The **Common Language Location Identifier** assigned to this point code.

`:domain` – The network in which the destination entity or node exists, SS7.

> **Note:**
>
> Specifying `:domain=ss7` is the only valid entry for cluster destinations.

`:bei` – Broadcast exception indicator that indicates whether transfer-prohibited (**TFP**) messages will be broadcast from this node. The `bei=yes` parameter means **TFPs** will not be broadcast. The `bei=no` parameter means **TFPs** will be broadcast.

`:ipgwapc`– (ANSI networks only)**IP** Gateway **Adjacent Point Code** indicator. Specify `ipgwapc=yes` to provide **SS7** linkset definition compatibility for gateway connections to IP-**SCPs**. The default is `ipgwapc=no`.

`:elei` – For cluster point codes only. Specifies whether or not the EAGLE maintains a dynamic status exception list for each cluster route that may be used to reach the member signaling points making up the cluster. The `elei=yes` parameter means the EAGLE does not maintain an exception list for the cluster point code specified by the `dpc` parameter. The `elei=no` parameter means the EAGLE does maintain an exception list for the cluster point code specified by the `dpc` parameter. The default value for the `elei` parameter is `no`.

`:ncai` – The nested-cluster-allowed indicator specifies whether or not the route to the cluster point code can be different from the route to a point code that is a member of the cluster point code. A point code is a member of a cluster point code if it has the same network identifier (**NI**) and network cluster (**NC**) values as the cluster point code. This parameter can be specified only for cluster point codes.

If the `ncai` parameter value is `yes`, the cluster point code is a nested cluster point code. Point codes that are members of this cluster point code can be assigned to routesets that are different from the routeset assigned to the cluster point code.

If the `ncai` parameter value is `no`, the cluster point code is not a nested cluster point code. Point codes that are members of this cluster point code must be assigned to the same routeset assigned to the cluster point code.

The default value for the `ncai` parameter is `no`.

See the Nested Cluster Routing section for more information on the nested cluster routing feature.

`:nprst` - NM bits reset. This parameter specifies whether the NM bits in an ITU IAM message should be set to 00. This parameter has two values.

- `off` - Do not set NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
- `on` - Set the NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
  The default value for this parameter is `off`.

`:rcause` - Release cause. This parameter specifies the condition that triggers the sending of a Release message. This parameter has these values.

- 0 - 127
- `none` - use the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.
  The default value for this parameter is `none`.

  If the `rlcopc` parameter value in the `rtrv-tipopts` output is on and a value of 0-127 is specified for the `rcause` parameter, then the `rcause` parameter value overrides the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.

`:splitiam` - This parameter specifies how and when to split an ITU IAM message into one IAM message and one SAM message. This parameter has these values.

- 15-31 - The maximum number of CdPN digits allowed in the IAM message before the splitting occurs. The remaining digits, up to a total of 32, are encoded in the SAM message.
- `none` - the value specified for the `splitiam` parameter in the `rtrv-tifopts` output is used to determine when to split the IAM message.
  The default value for this parameter is `none`.

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501
- TIF Selective Screening - part number 893040201

The status of these features is shown in the `rtrv-ctrl-feat` output. Perform the procedures in *TIF User's Guide* to enable these features.

`:sccpmsgcnv` - The `sccpmsgcnv` parameter controls SCCP UDT(S)/XUDT(S) message conversion for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. The `rtrv-ctrl-feat` output shows the status of the XUDT UDT Conversion feature. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature. This parameter contains these values.

- none - SCCP UDT(S)/XUDT(S) message conversion is not required on messages for the destination. This value is the default value for this parameter.
- udt2xudt - All UDT(S) messages for the destination are converted to XUDT(S) messages.
- xudt2udt - All non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages. Segmented XUDT(S) messages for the destination are not converted to UDT(S) messages.
- sxudt2udt - All segmented and non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages.

The `ent-dstn` command also contains the `homescp` and `homesmsc` parameters. The values for these parameters are `yes` and `no`. The value `no` is the default value for these parameters. The value `yes` for these parameters cannot be specified for a cluster point code. To specify the value `yes` for these parameters, perform the Adding a Destination Point Code or Changing a Destination Point Code procedures.

To add a cluster point code to the database, the Cluster Routing and Management Diversity feature must be on. The `ncai` parameter can be specified for the cluster point code only if both the Cluster Routing and Management Diversity and nested cluster routing features are on. This is shown by the entries `CRMD = on` (for the Cluster Routing and Management Diversity feature) and `NCR = on` (for the nested cluster routing feature) in the `rtrv-feat` command output.

The domain of the cluster point code must be SS7 (domain=ss7).

To enter an **ANSI** point code, an ANSI self ID for the EAGLE must be defined. This can be verified with the rtrv-sid command. The ANSI self ID is shown in the PCA field in the rtrv-sid command output. If no values are shown in the PCA field of the rtrv-sid command output, go to Changing the Self-Identification of the EAGLE procedure to add the ANSI Self ID of the EAGLE.

The actual number of destination point codes that can be configured in the database is set by the mtpdpcq parameter of the chg-stpopts command, and is shown in the MTPDPCQ field in the rtrv-stpopts command output. See 13.

If the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled, the sum of the mtpdpcq and mtpxlq parameters cannot exceed 2500. The range of values for the mtpdpcq and mtpxlq parameters is 500 to 2000.

If the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled the sum of the mtpdpcq and mtpxlq parameters cannot exceed 5500. The range of values for the mtpdpcq and mtpxlq parameters is 500 to 5000.

If 6000 routesets are enabled, the sum of the mtpdpcq and mtpxlq parameters cannot exceed 6500. The range of values for the mtpdpcq and mtpxlq parameters is 500 to 6000.

If 7000 routesets are enabled, the sum of the mtpdpcq and mtpxlq parameters cannot exceed 7500. The range of values for the mtpdpcq parameter is 500 to 7000. The range of values for the mtpxlq parameter is 500 to 6000.

If 8000 routesets are enabled, the sum of the mtpdpcq and mtpxlq parameters cannot exceed 8500. The range of values for the mtpdpcq parameter is 500 to 8000. The range of values for the mtpxlq parameter is 500 to 6000.

If 10,000 routesets are enabled, the sum of the mtpdpcq and mtpxlq parameters cannot exceed 10500. The range of values for the mtpdpcq and mtpxlq parameters is 500 to 10,000.

> **Note:**
>
> For more information on the destination point code quantities, go to the Changing the DPC Quantity procedure.

If the ncai parameter value is yes, the EAGLE can have a maximum of 200 nested cluster point codes in the database.

The value of the clli parameter cannot be in the **DPC** table and cannot match the **CLLI** of the EAGLE. Verify this by entering the rtrv-dstn and the rtrv-sid commands, shown in 3 and 4. If the value of the clli parameter matches any CLLI values in either of these outputs, choose another value for the clli parameter that does not match any CLLIs shown in either of these command outputs.

If the PCTYPE field of the rtrv-sid command output contains the entry ANSI, and the network value of the destination point codes specified by the ent-dstn command, is from 0 to 5, the cluster value of that point code must be from 1 to 255. If the network value of that point code is from 6 to 255, the cluster value of that point code must be from 0 to 255.

To add a cluster point code to the database when the database contains point codes that are members of the cluster, the linkset type used by the routes to the member point codes must be either B, C, or D. For example, you wish to add the cluster point code 004-004-* and the database contains point codes 004-004-001 and 004-004-002. When cluster point code is added, point codes 004-004-001 and 004-004-002 would become members of the cluster point code 004-004-*. If point codes 004-004-001 or 004-004-002 are the destination point codes of routes, and the linkset type of these routes are either A or E, the cluster point code 004-004-* cannot be added to the database. The linkset type of these routes must be changed to either B, C, or D to add cluster point code 004-004-* to the database. To change the linkset type of a linkset, perform the Changing an SS7 Linkset procedure.

The examples in this procedure are used to enter the cluster point code 111-011-* and the nested cluster point code 030-045-*.

Canceling the `RTRV-DSTN` Command

Because the `rtrv-dstn` command used in this procedure can output information for a long period of time, the `rtrv-dstn` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` command can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` command was entered, from another terminal other than the terminal where the `rtrv-dstn` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current destination point codes in the database, using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           CLLI        BEI ELEI   ALIASI           ALIASN/N24     DMN
   002-002-002    ----------- no  --- --------------   --------------    SS7
   020-002-045    rlghncbb100 no  --- --------------   --------------    SS7
   020-002-050    rlghncbb100 no  --- --------------   --------------    SS7
   030-045-001    ----------- yes --- --------------   --------------    SS7
   111-011-001    ----------- yes --- --------------   --------------    SS7
   240-012-005    rlghncbb002 yes ---    1-112-2          11112          SS7
   240-012-006    rlghncbb003 yes ---    1-112-3          11113          SS7

   DPCI           CLLI        BEI ELEI   ALIASA           ALIASN/N24     DMN
   2-131-1        rlghncbb023 no  ---    222-210-000      12001          SS7
   2-131-2        ----------- no  ---    222-211-001      12002          SS7
```

```
   DPCN          CLLI         BEI ELEI   ALIASA
ALIASI        DMN
   11211         rlghncbb013 no  ---    222-200-200
2-121-1       SS7
   11212         rlghncbb013 no  ---    222-200-201
2-121-2       SS7


DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   11
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 0
    TOTAL DPC(s):                  11
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  12
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If the addition of the cluster point code will not exceed the current DPC capacity shown in the `rtrv-dstn` output, continue the procedure with 2.

If the addition of the cluster point code will exceed the current DPC capacity, and the current capacity is less than 10,000 (or 10,500 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` fields are shown in the `rtrv-dstn` output), perform the Changing the DPC Quantity procedure to change the DPC quantity. Continue the procedure with 2.

If the addition of the cluster point code will exceed the current DPC capacity, and the current capacity is 10,000 (or 10,500 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` fields are shown in the `rtrv-dstn` output), perform the Removing a Destination Point Code procedure to remove a DPC or perform the Removing a Route Exception Entry procedure to remove an exception route. Continue the procedure with 2.

> **Note:**
>
> If the`rtrv-dstn` output in1shows any cluster point codes, and nested cluster point codes are not being configured in this procedure, continue the procedure with3.

> **Note:**
>
> If cluster point codes are not shown in the`rtrv-dstn` output in1, but ANSI point codes are shown in1, continue the procedure with3.

2. Display the self-identification of the EAGLE using the `rtrv-sid` command. This is an example of the possible output..

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
PCA              PCI              PCN           CLLI            PCTYPE
010-020-030      0-123-1          12-0-14-1     rlghncxa03w     OTHER

CPCA
002-002-002       002-002-003       002-002-004      002-002-005
002-002-006       002-002-007       002-002-008      002-002-009
004-002-001       004-003-003       050-060-070

CPCI
1-001-1           1-001-2           1-001-3          1-001-4
1-002-1           1-002-2           1-002-3          1-002-4
2-001-1           7-222-7

CPCN
2-0-10-3          2-0-11-0          2-0-11-2          2-0-12-1
2-2-3-3           2-2-4-0           10-14-10-1
```

If the **PCA** field does not contain an entry, perform the Changing the Self-Identification of the EAGLE procedure and add an ANSI point code to the self identification of the EAGLE.

> **Note:**
>
> If the`DESTINATION ENTRIES ALLOCATED`and`X-LIST ENTRIES ALLOCATED` fields are shown in the`rtrv-dstn` output in1, and nested cluster point codes are not being configured in this procedure, continue the procedure with6.

3. Verify that the Cluster Routing and Management Diversity feature is turned on, by entering the `rtrv-feat` command. If nested cluster point codes are to be configured in the database, the nested cluster routing feature must be turned on. If the Cluster Routing and Management Diversity feature is turned on, the `CRMD` field should be set to `on`. If the nested cluster routing feature is turned on, the `NCR` field should be set to `on`. In this example, both features are off.

> **Note:**
>
> The`rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-feat` command, see the`rtrv-feat` command description in *Commands User's Guide*.

4. Turn the Cluster Routing and Management Diversity feature on by entering this command.

   `chg-feat:crmd=on`

> **Note:**
>
> If the Cluster Routing and Management Diversity feature is on, shown by the`CRMD = on` entry in the`rtrv-feat` command output in3, continue the procedure with5.

> **Note:**
>
> Once the Cluster Routing and Management Diversity feature is turned on with the`chg-feat` command, it cannot be turned off.
> The Cluster Routing and Management Diversity feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Cluster Routing and Management Diversity feature, contact your Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

If nested cluster point codes are being added to the database or the `ncai` parameter is be specified for the cluster point code and the nested cluster routing feature is on, shown by the `NCR = on` entry in the `rtrv-feat` command output in 3, and DPCs are shown in the rtrv-dstn output that are members of the cluster point code that is being added, continue the procedure with 6. If the `rtrv-dstn` output does not show any DPCs that are members of the cluster point code being added, continue the procedure with 9.

If nested cluster point codes are being added to the database or the `ncai` parameter is be specified for the cluster point code and the nested cluster routing feature is off, continue the procedure with 5.

5. Turn the nested cluster routing feature on by entering this command.

   `chg-feat:ncr=on`

> **Note:**
>
> Once the nested cluster routing feature is turned on with the`chg-feat` command, it cannot be turned off.
> The nested cluster routing feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the nested cluster routing feature, contact your Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

> **Note:**
>
> If the`rtrv-dstn` output does not show any DPCs that are members of the cluster point code being added in this procedure, continue the procedure with 9 .

6. The cluster point code cannot be added to the database if the database contains member point codes assigned to routes that are assigned to linksets whose linkset type is either A or E.

   Enter the `rtrv-rte` command with one of the DPCs that is a member of the cluster point code being added in this procedure. For this example, enter these commands.

   `rtrv-rte:dpca=111-011-001`

   This is an example of the possible output.

```
rlghncxa03w 07-05-17 15:35:05 GMT  EAGLE5 37.0.0
   DPCA            ALIASI     ALIASN/N24     LSN         RC    APCA
   111-011-001     -------    -----------    lsn2        10   111-011-001
                                                 RTX:No   CLLI=-----------
```

   `rtrv-rte:dpca=030-045-001`

   This is an example of the possible output.

```
rlghncxa03w 07-05-17 15:35:05 GMT  EAGLE5 37.0.0
   DPCA            ALIASI     ALIASN/N24     LSN         RC    APCA
   030-045-001     -------    -----------    lsn3        10    030-045-001
                                                 RTX:No   CLLI=-----------
```

   If the DPC specified in this step is the DPC of a route, continue the procedure with 7.

   If the DPC specified in this step is not the DPC of a route, repeat this step for other DPCs, shown in the `rtrv-dstn` output, that are members of the cluster point code being added in this procedure.

   If all the DPCs that are members of the cluster point code being added have been displayed, and none of these DPCs are DPCs of routes, continue the procedure with 9.

7. Enter the `rtrv-ls` command with the linkset name shown in the `rtrv-rte` output in 6.

   The linkset name is shown in the `LSN` column of the `rtrv-rte` output. For this example, enter these commands.

   `rtrv-ls:lsn=lsn2`

This is an example of the possible output.

```
rlghncxa03w 09-05-17 15:35:05 GMT  EAGLE5 41.0.0

                                 L3T SLT             GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn2          111-011-001   none 1   1   no  B   2    off off off
no    off

           CLLI         TFATCABMLQ MTPRSE ASL8
           -----------  1          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE          CGGTMOD
           no    no       CdPA               no

                                  L2T              PCR   PCR
           LOC  LINK SLC TYPE     SET  BPS    ECM   N1    N2
           1103 A     0  LIMDS0   1    56000  BASIC ---   -----
           1104 A     1  LIMDS0   1    56000  BASIC ---   -----

Link set table is (6 of 1024) 1% full.
```

```
rtrv-ls:lsn=lsn3
```

This is an example of the possible output.

```
rlghncxa03w 09-05-17 15:35:05 GMT  EAGLE5 41.0.0

                                 L3T SLT             GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn3          030-045-001   none 1   1   no  B   2    off off off
no    off

           CLLI         TFATCABMLQ MTPRSE ASL8
           -----------  1          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE          CGGTMOD
           no    no       CdPA               no

                                  L2T              PCR   PCR
           LOC  LINK SLC TYPE     SET  BPS    ECM   N1    N2
           1103 B     0  LIMDS0   1    56000  BASIC ---   -----
           1104 B     1  LIMDS0   1    56000  BASIC ---   -----
```

```
Link set table is (6 of 1024) 1% full.
```

If the linkset type of the linkset is either A or E, performChanging an SS7 Linkset to change the linkset type to B, C, or D.

If all the DPCs that are members of the cluster point code being added have not been displayed in 6, repeat 6 and 7.

After all the linksets whose APCs are members of the cluster point code that is being added, and the linkset type of these linksets shown in this step is B, C, or D, or the linkset type was changed, continue the procedure by performing one of these steps.

- If the `nprst`, `rcause`, or `splitiam` parameters will not be specified for the cluster point code, continue the procedure with 9 .
- If the `nprst`, `rcause`, or `splitiam` parameters will be specified for the cluster point code, continue the procedure with 8.

8. Display the features that are enabled by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 10-12-17 15:35:05 GMT  EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status Quantity
HC-MIM SLK Capacity       893012707 on     64
TIF Number Portability    893018901 off    ----
XUDT UDT Conversion       893035301 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum    Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501

Perform the procedures in *TIF User's Guide* to enable these features as required.

9. Continue the procedure by performing one of these steps.

- Continue the procedure with 11 if any of these conditions are present.
  – The `sccpmsgcnv` parameter will not be specified for the cluster point code.
  – The `sccpmsgcnv` parameter will be specified for the cluster point code and the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is enabled and turned on. If the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.
- Continue the procedure with 10 if the `sccpmsgcnv` parameter will be specified for the cluster point code and 8 was not performed.

10. Enter this command to verify the status of the XUDT UDT Conversion feature.

    `rtrv-ctrl-feat:partnum=893035301`

    This is an example of the possible output.

```
rlghncxa03w 10-12-17 15:35:05 GMT  EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
XUDT UDT Conversion       893035301 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

    If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

    If the XUDT UDT Conversion feature is enabled and turned on, or the "Activating the XUDT UDT Conversion Feature" procedure was performed in this step, continue the procedure with 11.

11. Add the cluster point code to the database, by using the `ent-dstn` command.

    For this example, enter these commands.

```
ent-dstn:dpca=111-011-
*:clli=rlghncbb000:bei=yes:elei=yes:domain=ss7
```

```
ent-dstn:dpca=030-045-
*:clli=rlghncbb010:bei=yes:elei=yes :domain=ss7:ncai=yes
```

```
ent-dstn:dpca=100-075-
*:bei=yes:elei=yes:ncai=yes:nprst=on:rcause=15 :splitiam=10:sccpm
sgcnv=udt2xudt
```

When these commands have successfully completed, this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT  EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   12
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  15
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  12
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
ENT-DSTN: MASP A - COMPLTD
```

12. Verify the changes using the `rtrv-dstn` command and specifying the DPC that was entered in 11.

For this example, enter these commands.

`rtrv-dstn:dpca=111-011-*`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   111-011-*     rlghncbb000 yes yes ----------      --------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  no           none    off   none      no      no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   12
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  15
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  12
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

`rtrv-dstn:dpca=030-045-*`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   030-045-*     rlghncbb010 yes yes ----------
--------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  no           none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   12
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  15
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  12
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpca=100-075-*
```

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   100-075-*     ----------- yes yes ----------
--------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  yes          15     on      10     no     no
udt2xudt

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   12
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  15
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  12
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

> **Note:**
>
> If you do not wish to change the exception list parameters for the Cluster Routing and Management Diversity feature, continue the procedure with16.

13. The parameters for the exception list for the Cluster Routing and Management Diversity feature can be changed from the default settings by using the `chg-stpopts` command. The parameters of the `chg-stpopts` command that control the exception point-code list are:

    `mtpxlq` = the maximum number of entries the exception list (x-list) can contain

    `mtpxlet` = the maximum amount of time the **EAGLE** will maintain an unreferenced exception list (x-list) entry, expressed in the format `hhmm`, where `hh` is the number of hours, and `mm` is the number of minutes.

    `mtpxlot` = the exception list (x-list) occupancy threshold (in terms of percentage of space available). If this threshold is exceeded, the EAGLE raises a minor alarm.

    `mtpdpcq` = the maximum number of destination point codes that can be configured on the EAGLE.

    > **Note:**
    >
    > The sum of the`MTPDPCQ` and`MTPXLQ` value's cannot exceed one of these totals depending on the features that are enabled or turned on:
    >
    > - 2500 – if the 5000 Routes feature is not on, and 6000, 7000, or 8000 routesets are not enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is 500 to 2000.
    > - 5500 – if the 5000 Routes feature is on, but 6000, 7000, or 8000 routesets are not enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is 500 to 5000.
    > - 6500 – if 6000 routesets are enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is 500 to 6000.
    > - 7500 – if 7000 routesets are enabled. The range of values for the `mtpdpcq` parameter is 500 to 7000. The range of values for the `mtpxlq` parameter is 500 to 6000.
    > - 8500 – if 8000 routesets are enabled. The range of values for the `mtpdpcq` parameter is 500 to 8000. The range of values for the `mtpxlq` parameter is 500 to 6000.
    > - 10,500 – if 10,000 routesets are enabled. The range of values for the `mtpdpcq` and `mtpxlq` parameters is 500 to 10,000.

    Display the existing values for the exception list parameters, by entering the `rtrv-stpopts` command. This is an example of the possible output.

    ```
    rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
    STP OPTIONS
    ```

```
-----------------------
MTPXLQ              500
MTPXLET            0100
MTPXLOT             90%
MTPDPCQ            2000
```

Note:

The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

Note:

If the Cluster Routing and Management Diversity was turned on in this procedure, the `MTPXLQ`, `MTPXLET`, and `MTPXLOT` parameters are shown with these default values.

- `MTPXLQ` – 500
- `MTPXLET` – 0100
- `MTPXLOT` – 90%

The `MTPDPCQ` value is not changed when the **Cluster** Routing and Management Diversity is turned on.

14. If you wish to change the exception list parameters or the `mtpdpcq` value, enter the `chg-stpopts` command.

Note:

If the DPC quantity or the exception list quantity is being changed in this step, both the `mtpdpcq` and `mtpxlq` parameters do have to be specified in this step unless the resulting sum of the `mtpdpcq` and `mtpxlq` parameters would exceed the totals shown in 12. For example, the current `mtpdpcq` value is 4000 and the current `mtpxlq` value is 1500, resulting in a sum of 5500, and only the 5000 Routes feature is on. To change either value, both parameters must be specified and the sum of the new values cannot exceed 5500. If in this example, the current `mtpdpcq` value is 3000 and the current `mtpxlq` value is 1500, resulting in a sum of 4500, either parameter value can be changed without specifying the other parameter as long as the sum of the values does not exceed 5500.

For this example, change the DPC quantity value to 1750, the exception list size to 750, the exception list timer to 1 hour and 30 minutes (90 minutes), and the exception list occupancy threshold to 75%. Enter this command.

```
chg-stpopts:mtpdpcq=1750:mtpxlq=750:mtpxlet=0130:mtpxlot=75
```

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

15. Verify the changes using the `rtrv-stpopts` command.

    This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
MTPXLQ              750
MTPXLET            0130
MTPXLOT             75%
MTPDPCQ            1750
```

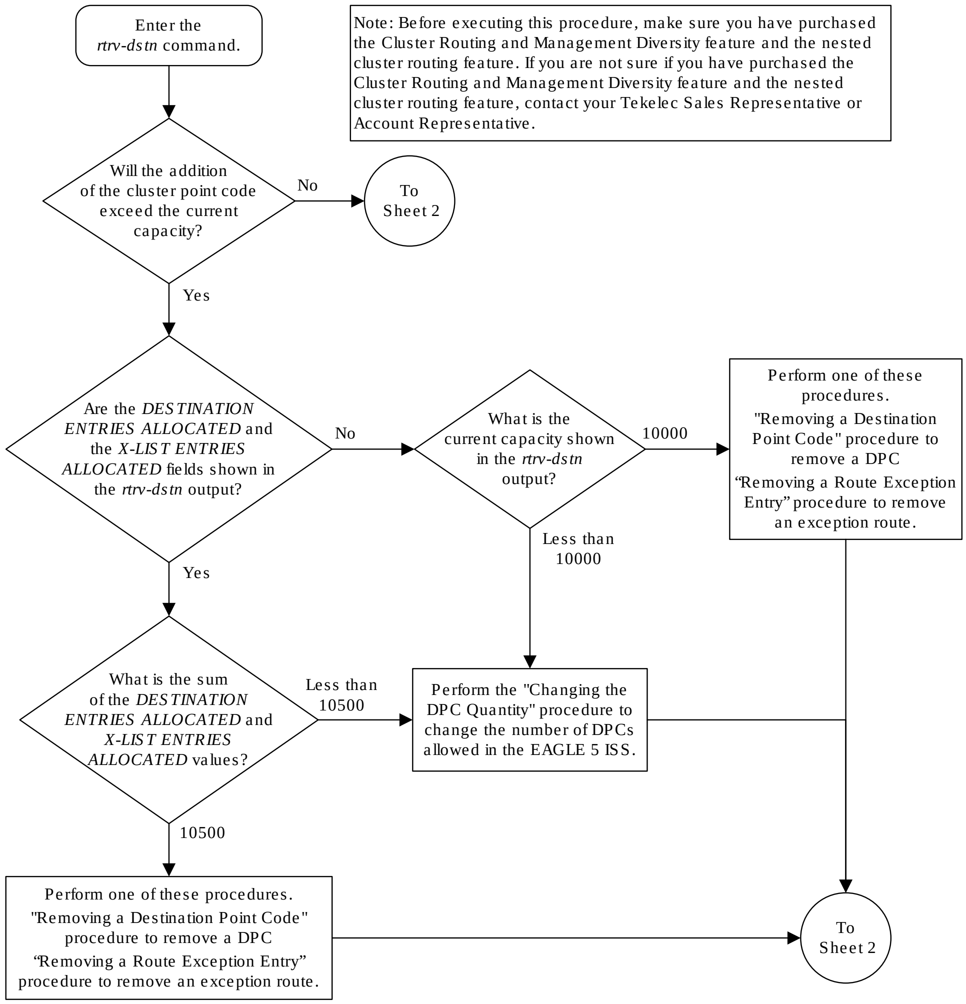
> **Note:**
>
> The`rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-stpopts` command, see the`rtrv-stpopts` command description in *Commands User's Guide*.

16. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

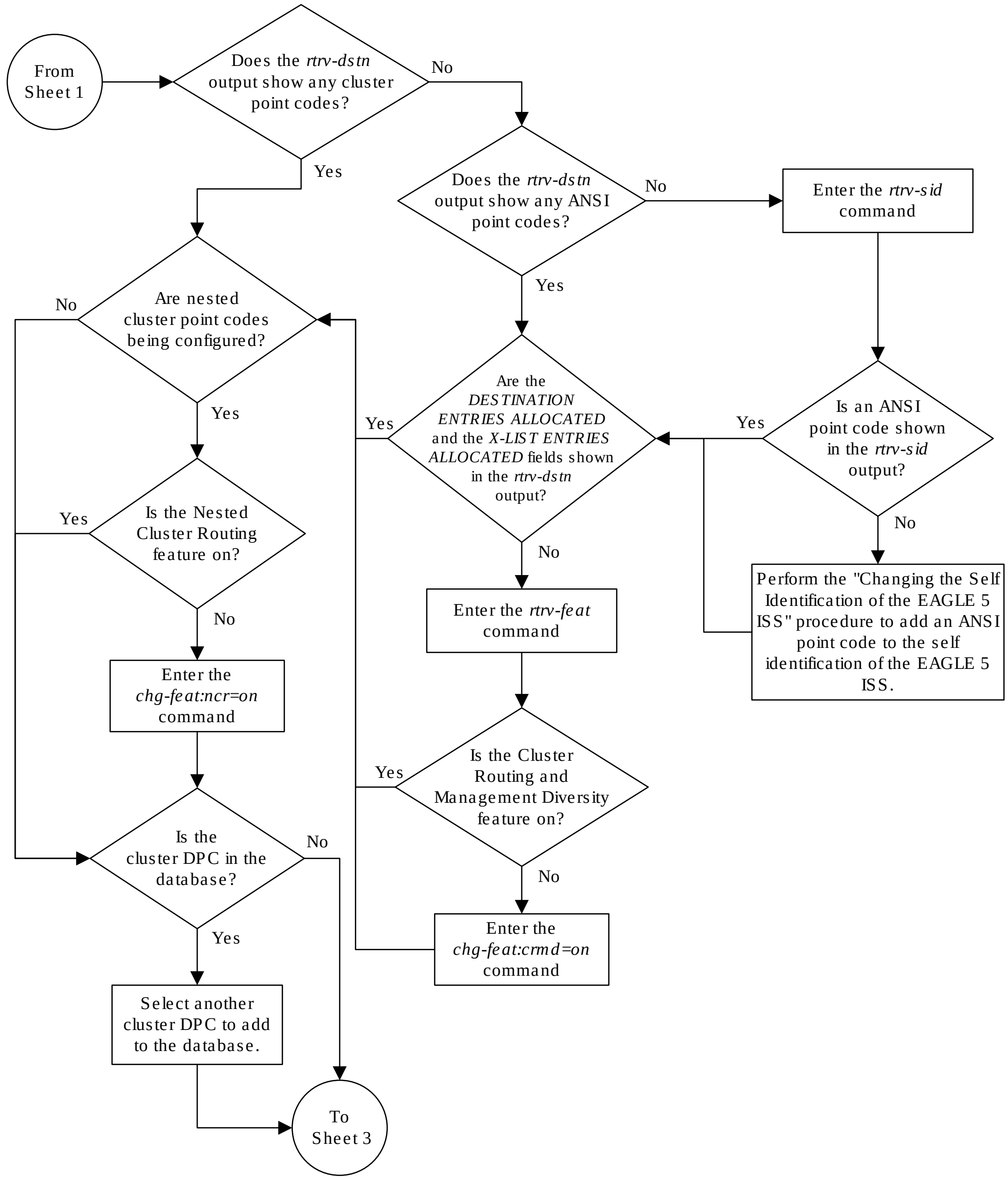
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

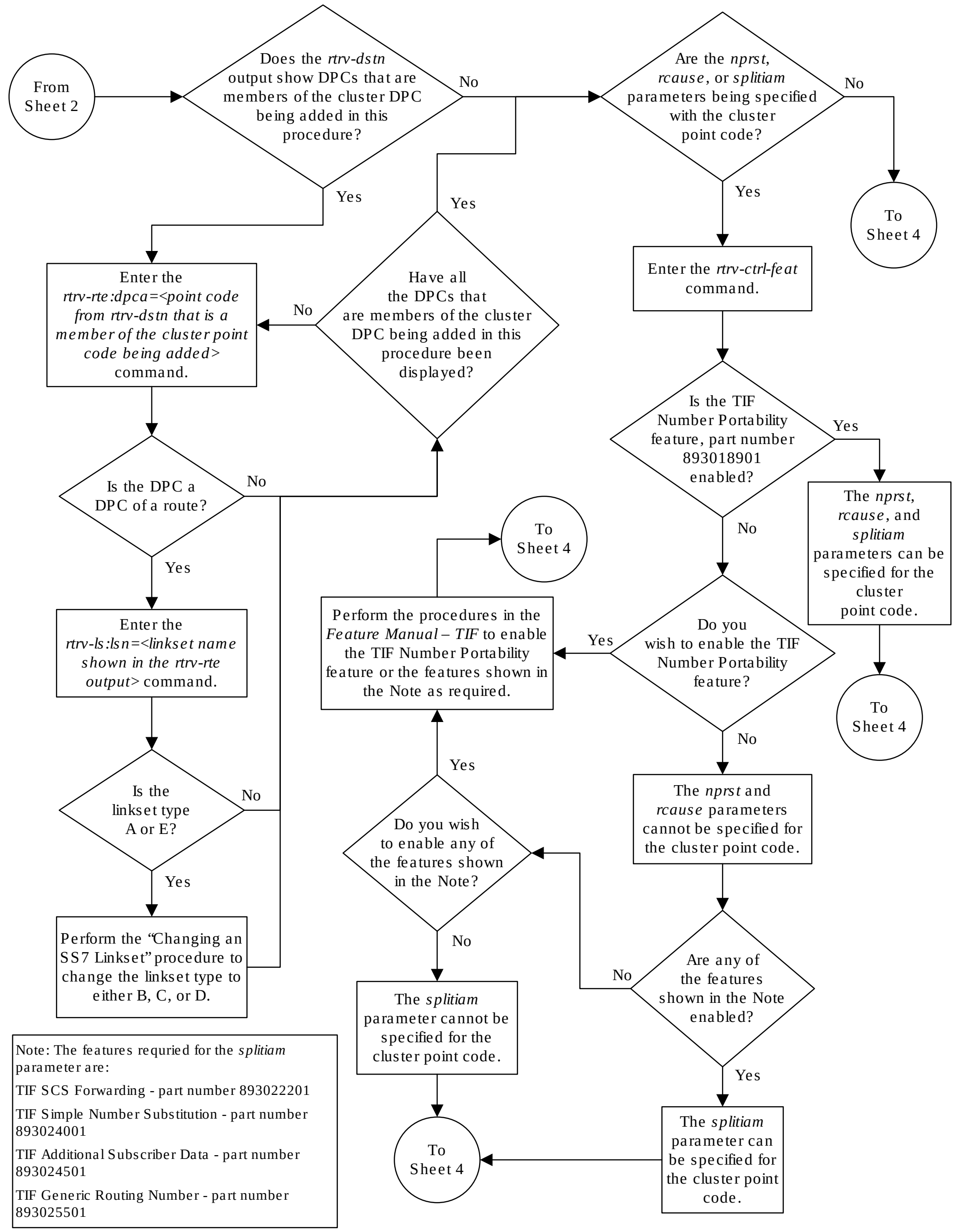
Figure 2-25 Adding a Cluster Point Code



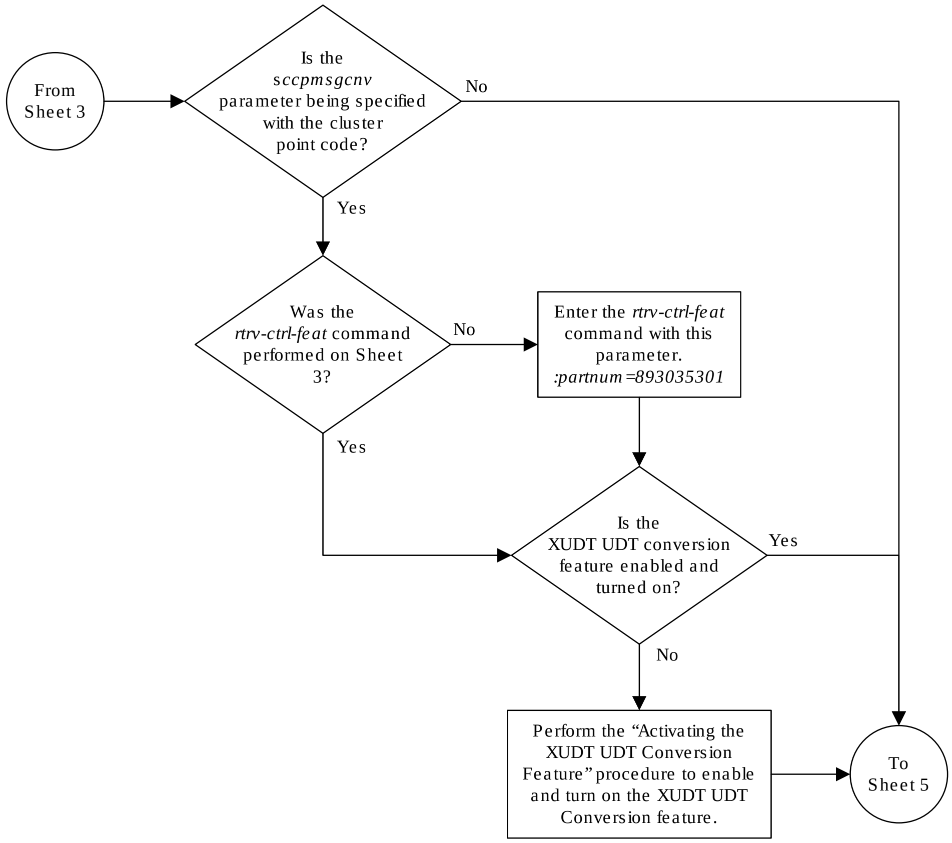
Sheet 1 of 5


From Sheet 1
Does the rtrv-dstn output show any cluster point codes?
No
Yes
Does the rtrv-dstn output show any ANSI point codes?
No
Enter the rtrv-sid command
Yes
Are nested cluster point codes being configured?
No
Yes
Are the DESTINATION ENTRIES ALLOCATED and the X-LIST ENTRIES ALLOCATED fields shown in the rtrv-dstn output?
Yes
Is an ANSI point code shown in the rtrv-sid output?
Yes
No
Is the Nested Cluster Routing feature on?
Yes
No
Enter the rtrv-feat command
Perform the "Changing the Self Identification of the EAGLE 5 ISS" procedure to add an ANSI point code to the self identification of the EAGLE 5 ISS.
Enter the chg-feat:ncr=on command
Is the Cluster Routing and Management Diversity feature on?
Yes
No
Is the cluster DPC in the database?
No
Yes
Enter the chg-feat:crmd=on command
Select another cluster DPC to add to the database.
To Sheet 3

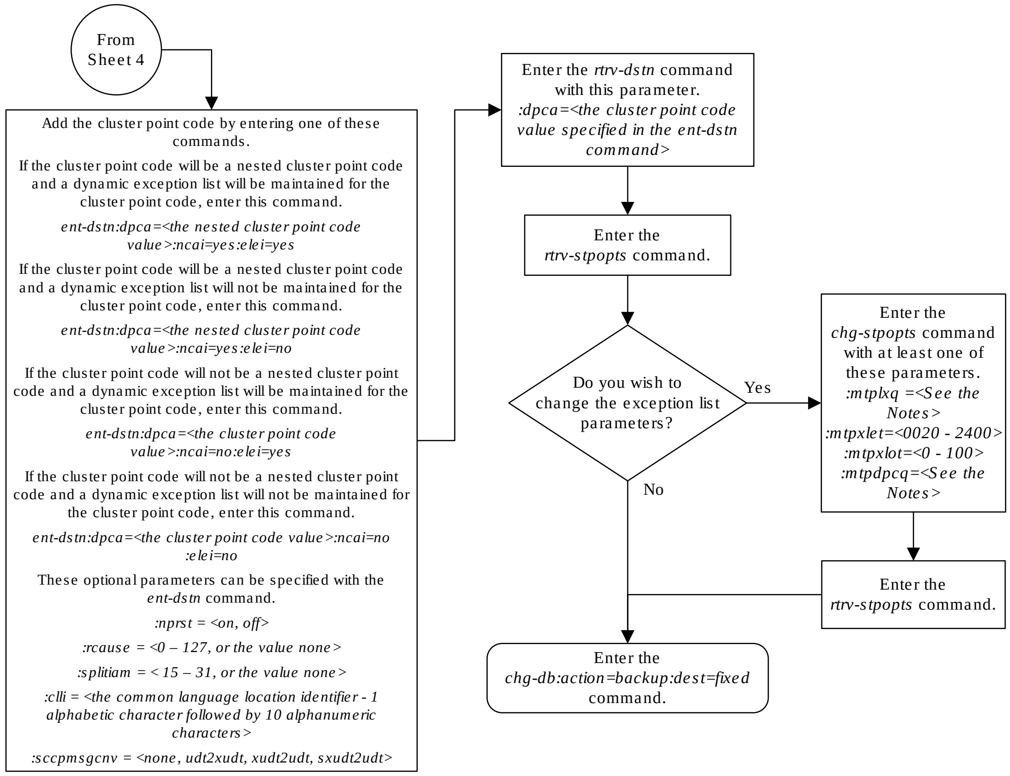
Sheet 2 of 5


From Sheet 2
Does the rtrv-dstn output show DPCs that are members of the cluster DPC being added in this procedure?
No
Yes
Are the nprst, rcause, or splitiam parameters being specified with the cluster point code?
No
Yes
To Sheet 4
Enter the rtrv-rte:dpca=<point code from rtrv-dstn that is a member of the cluster point code being added> command.
No
Have all the DPCs that are members of the cluster DPC being added in this procedure been displayed?
Yes
Enter the rtrv-ctrl-feat command.
Is the TIF Number Portability feature, part number 893018901 enabled?
Yes
No
The nprst, rcause, and splitiam parameters can be specified for the cluster point code.
To Sheet 4
Is the DPC a DPC of a route?
No
Yes
To Sheet 4
Enter the rtrv-ls:lsn=<linkset name shown in the rtrv-rte output> command.
Perform the procedures in the Feature Manual – TIF to enable the TIF Number Portability feature or the features shown in the Note as required.
Yes
Do you wish to enable the TIF Number Portability feature?
No
Is the linkset type A or E?
No
Yes
Do you wish to enable any of the features shown in the Note?
Yes
No
The nprst and rcause parameters cannot be specified for the cluster point code.
Perform the "Changing an SS7 Linkset" procedure to change the linkset type to either B, C, or D.
The splitiam parameter cannot be specified for the cluster point code.
No
Are any of the features shown in the Note enabled?
Yes
Note: The features requried for the splitiam parameter are:
TIF SCS Forwarding - part number 893022201
TIF Simple Number Substitution - part number 893024001
TIF Additional Subscriber Data - part number 893024501
TIF Generic Routing Number - part number 893025501
To Sheet 4
The splitiam parameter can be specified for the cluster point code.

Sheet 3 of 5


From Sheet 3
Is the sccpmsgcnv parameter being specified with the cluster point code?
No
Yes
Was the rtrv-ctrl-feat command performed on Sheet 3?
No
Enter the rtrv-ctrl-feat command with this parameter.
:partnum=893035301
Yes
Is the XUDT UDT conversion feature enabled and turned on?
Yes
No
Perform the "Activating the XUDT UDT Conversion Feature" procedure to enable and turn on the XUDT UDT Conversion feature.
To Sheet 5

Sheet 4 of 5



Notes:

1. The sum of the values for the *mtpdpcq* and *mtpxlq* parameters cannot exceed these values, depending which routeset quantity has been enabled with the *enable-ctrl-feat* command, or turned on with the *chg-feat* command:

5000 routes not turned on, 6000, 7000, or 8000 routesets not enabled - **2500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 2000.

5000 routes turned on, 6000, 7000, or 8000 routesets not enabled - **5500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 5000.

6000 routesets enabled - **6500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 6000.

7000 routesets enabled - **7500**. The range of values for the *mtpdpcq* parameter is 500 to 7000. The range of values for the *mtpxlq* parameter is 500 to 6000.

8000 routesets enabled - **8500**. The range of values for the *mtpdpcq* parameter is 500 to 8000. The range of values for the *mtpxlq* parameter is 500 to 6000.

10000 routesets enabled - **10500**. The range of values for the *mtpdpcq* and *mtpxlq* parameters is 500 to 10000.

2. If the DPC quantity or the exception list quantity is being changed in this step, both the *mtpdpcq* and *mtpxlq* parameters do have to be specified in this step unless the resulting sum of the *mtpdpcq* and *mtpxlq* parameters would exceed the totals shown in Note 1.

For example, the current *mtpdpcq* value is 4000 and the current *mtpxlq* value is 1500, resulting in a sum of 5500, and only the 5000 Routes feature is on. To increase either value, both parameters must be specified and the sum of the new values cannot exceed 5500. If either value is being decreased, the other parameter can be specified as long as the sum of the values does not exceed 5500.

If in this example, the current *mtpdpcq* value is 3000 and the current *mtpxlq* value is 1500, resulting in a sum of 4500, either parameter value can be changed without specifying the other parameter as long as the sum of the values does not exceed 5500.

Sheet 5 of 5

2.18 Changing the Attributes of a Cluster Point Code

This procedure is used to change the attributes of a cluster point code in the database, using the `chg-dstn` command.

> **Note:**
>
> **Cluster** entries can be provisioned only as **ANSI** destination point codes. Cluster entries cannot be provisioned for **ITU** international or ITU national destination point codes, and cannot be provisioned as a proxy point code. The ANSI alias point code for an ITU international or ITU national destination point code must be a full point code. An ANSI private point code must be a full point code.

To add a new cluster point code to the database, perform the Adding a Cluster Point Code procedure.

To remove a cluster point code from the database, perform the Removing a Destination Point Code procedure.

The cluster point code to be changed must be in the database.

The `chg-dstn` command uses these parameters:

`:dpc/dpca` – The destination point code in the database being changed

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE.

> **Note:**
>
> Alias point codes (`aliasi`/`aliasn`/`aliasn24`) and secondary point codes (`spc`/`spca`) cannot be specified for a cluster point code.

`:clli` – The **Common Language Location Identifier** assigned to this point code

`:domain` – The network in which the destination entity or node exists- SS7.

`:bei` – Broadcast exception indicator that indicates whether transfer-prohibited (**TFP**) messages will be broadcast from this node. The `bei=yes` parameter means TFPs will not be broadcast. The `bei=no` parameter means TFPs will be broadcast.

`:ipgwapc` – (ANSI networks only)**IP** Gateway **Adjacent Point Code** indicator. Specify `ipgwapc=yes` to provide SS7 linkset definition compatibility for gateway connections to IP-SCPs. The default is `ipgwapc=no`.

`:elei` – For cluster point codes only. Specifies whether or not the EAGLE maintains a dynamic status exception list for each cluster route that may be used to reach the member signaling points making up the cluster. The `elei=yes` parameter means the EAGLE does not maintain an exception list for the cluster point code specified by the `dpc` parameter. The `elei=no` parameter means the EAGLE does maintain an exception list for the cluster point code specified by the `dpc` parameter.

`:ncai` – The nested-cluster-allowed indicator specifies whether or not the route to the cluster point code can be different from the route to a point code that is a member of the cluster point code. A point code is a member of a cluster point code if it has the same network identifier (**NI**) and network cluster (**NC**) values as the cluster point code. This parameter can be specified only for cluster point codes.

If the `ncai` parameter value is `yes`, the cluster point code is a nested cluster point code. Point codes that are members of this cluster point code can be assigned to routesets that are different from the routeset assigned to the cluster point code.

If the `ncai` parameter value is `no`, the cluster point code is not a nested cluster point code. Point codes that are members of this cluster point code must be assigned to the same routeset assigned to the cluster point code.

Refer to the Nested Cluster Routing section for more information on the nested cluster routing feature.

`:nprst` - NM bits reset. This parameter specifies whether the NM bits in an ITU IAM message should be set to 00. This parameter has two values.

- `off` - Do not set NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
- `on` - Set the NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
  The default value for this parameter is `off`.

`:rcause` - Release cause. This parameter specifies the condition that triggers the sending of a Release message. This parameter has these values.

- 0 - 127
- `none` - use the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.
  The default value for this parameter is `none`.

  If the `rlcopc` parameter value in the `rtrv-tipopts` output is on and a value of 0-127 is specified for the `rcause` parameter, then the `rcause` parameter value overrides the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.

`:splitiam` - This parameter specifies how and when to split an ITU IAM message into one IAM message and one SAM message. This parameter has these values.

- 15-31 - The maximum number of CdPN digits allowed in the IAM message before the splitting occurs. The remaining digits, up to a total of 32, are encoded in the SAM message.
- `none` - the value specified for the `splitiam` parameter in the `rtrv-tifopts` output is used to determine when to split the IAM message.
  The default value for this parameter is `none`.

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501

- TIF Generic Routing Number - part number 893025501
  The status of these features is shown in the `rtrv-ctrl-feat` output. Perform the procedures in *TIF User's Guide* to enable these features.

`:sccpmsgcnv` - The `sccpmsgcnv` parameter controls SCCP UDT(S)/XUDT(S) message conversion for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. The `rtrv-ctrl-feat` output shows the status of the XUDT UDT Conversion feature. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature. This parameter contains these values.

- none - SCCP UDT(S)/XUDT(S) message conversion is not performed on messages for the destination.
- udt2xudt - All UDT(S) messages for the destination are converted to XUDT(S) messages.
- xudt2udt - All non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages. Segmented XUDT(S) messages for the destination are not converted to UDT(S) messages.
- sxudt2udt - All segmented and non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages.

The `chg-dstn` command also contains the `homescp` and `homesmsc` parameters. The values for these parameters are `yes` and `no`. The value `no` is the system default value for these parameters. The value `yes` for these parameters cannot be specified for a cluster point code. To specify the value `yes` for these parameters, perform the Adding a Destination Point Code or Changing a Destination Point Code procedures.

The value of the `clli` parameter cannot be in the **DPC** table and cannot match the **CLLI** of the EAGLE. Verify this by entering the `rtrv-dstn` and the `rtrv-sid` commands, shown in 1 and 3. If the value of the `clli` parameter matches any CLLI values in either of these outputs, choose another value for the `clli` parameter that does not match any CLLIs shown in either of these command outputs.

If a nested cluster point code is changed to a non-nested cluster point code (the value of the `ncai` parameter is changed from `yes` to `no`), any point codes that are members of this point code must be assigned to the same routeset as the cluster point code.

The `elei` (exception list exclusion indicator) parameter can be specified only for a cluster destination point code. Cluster destination point codes and the `elei` parameter can be specified only if the Cluster Routing and Management Diversity feature is turned on. Verify this with the `rtrv-feat` command. If the Cluster Routing and Management Diversity feature is turned on, the `CRMD` field should be set to `on`. If the Cluster Routing and Management Diversity feature is not turned on, enter the `chg-feat:crmd=on` command. For more information on the Cluster Routing and Management Diversity feature, refer to the Cluster Routing and Management Diversity (CRMD) section.

The `ncai` parameter can be specified only if the Nested Cluster Routing feature is on. This can be verified with the entry `NCR = on` in the `rtrv-feat` command output. If the nested cluster routing feature is not turned on, enter the `chg-feat:ncr=on` command. For more information on the nested cluster routing feature, refer to the Nested Cluster Routing section.

> **Note:**
>
> Once the Cluster Routing and Management Diversity and nested cluster routing features are turned on with the `chg-feat` command, they cannot be turned off.
> The Cluster Routing and Management Diversity and nested cluster routing features must be purchased before you turn these features on with the `chg-feat` command. If you are not sure if you have purchased the Cluster Routing and Management Diversity and nested cluster routing features, contact your Sales Representative or Account Representative.

The examples in this procedure are used to change the attributes of the cluster point code 030-003-*.

Canceling the `RTRV-DSTN` and `RTRV-RTE` Commands

Because the`rtrv-dstn` and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-dstn` and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` and `rtrv-rte` commands can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered, from another terminal other than the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current destination point codes, using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   020-002-*     rlghncbb000 yes yes ----------
--------------   SS7
   240-012-004   rlghncbb001 yes ---    1-111-1
10-13-9-3     SS7
   240-012-005   rlghncbb002 yes ---    1-112-2
```

```
10-13-10-0    SS7
   240-012-006   rlghncbb003 yes ---    1-112-3         10-13-10-1    SS7
   240-012-007   ----------- yes ---    1-117-3         10-13-11-1    SS7
   240-012-008   ----------- yes ---    1-113-5         10-13-10-2    SS7
   030-003-*     rlghncbb333 yes yes ----------      --------------   SS7
   030-003-100   rlghncbb334 yes ---    1-112-3         10-13-10-1    SS7
   030-003-200   rlghncbb335 yes ---    1-117-3         10-13-11-1    SS7
   030-003-225   rlghncbb336 yes --- ----------      --------------   SS7

   DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24    DMN
   2-131-1       rlghncbb023 no  ---    222-210-000     11-11-8-1     SS7
   2-131-2       ----------- no  ---    222-211-001     11-11-8-2     SS7
   2-131-3       ----------- no  ---    222-211-002     11-11-8-3     SS7
   4-163-5       ----------- no  ---    250-200-007     15-11-5-1     SS7

   DPCN          CLLI        BEI ELEI   ALIASA          ALIASI        DMN
   7-9-10-1      ----------- no  ---    210-090-100     1-75-6        SS7
   10-15-2-3     rlghncbb013 no  ---    222-200-200     2-121-1       SS7
   10-15-3-0     rlghncbb013 no  ---    222-200-201     2-121-2       SS7


DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  22
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  28
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If the CLLI value for the cluster point code is not being changed in this procedure, continue the procedure with 3.

If the CLLI value for the cluster point code is being changed in this procedure, continue the procedure with 2.

2. Display the self-identification of the EAGLE using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
   PCA              PCI          PCN                 CLLI
PCTYPE

   010-020-030      0-123-1      12-0-14-1           rlghncxa03w       OTHER

   CPCA
   002-002-002        002-002-003        002-002-004       002-002-005
   002-002-006        002-002-007        002-002-008       002-002-009
   004-002-001        004-003-003        050-060-070
```

```
   CPCI
   1-001-1           1-001-2           1-001-3          1-001-4
   1-002-1           1-002-2           1-002-3          1-002-4
   2-001-1           7-222-7

   CPCN
   2-0-10-3          2-0-11-0          2-0-11-2          2-0-12-1
   2-2-3-3           2-2-4-0           10-14-10-1
```

If the CLLI value for the cluster point code is being changed in this procedure, that CLLI value cannot be shown in the CLLI fields of either the `rtrv-dstn` (1) or the `rtrv-sid` command outputs.

3. Display the attributes of the cluster point code being changed, by entering the `rtrv-dstn` command and specifying the cluster point code that is being changed.

   For this example, enter this command.

   `rtrv-dstn:dpca=030-003-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   030-003-*     rlghncbb333 yes yes ----------
--------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  yes          none   off   none     no     no     none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  22
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  28
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

   Continue the procedure by performing one of these steps.

   - If the `nprst`, `rcause`, `splitiam`, `sccpmsgcnv`, or `ncai` parameter values will not be changed, continue the procedure with 10.
   - If only the `ncai` parameter value will be changed, continue the procedure by performing one of these steps.
     – If the current `ncai` parameter value is `no`, continue the procedure with 8.

   - If the current `ncai` parameter value is `yes`, continue the procedure with 6.
- If the `sccpmsgcnv` parameter value will be changed and the `nprst`, `rcause`, or `splitiam` parameter values will not be changed, continue the procedure with 5.
- If the `nprst`, `rcause`, or `splitiam` parameter value will be changed, continue the procedure with 4.

4. Display the features that are enabled by entering the `rtrv-ctrl-feat`command. This is an example of the possible output.

```
rlghncxa03w 10-12-17 15:35:05 GMT  EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status Quantity
HC-MIM SLK Capacity       893012707 on     64
TIF Number Portability    893018901 off    ----
XUDT UDT Conversion       893035301 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum    Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501

Perform the procedures in *TIF User's Guide* to enable these features as required.

Continue the procedure by performing one of these steps.

- If the `sccpmsgcnv` or `ncai` parameter values will not be changed, continue the procedure with 10.
- If only the `ncai` parameter value will be changed, continue the procedure by performing one of these steps.
   - If the current `ncai` parameter value is `no`, continue the procedure with 8.
   - If the current `ncai` parameter value is `yes`, continue the procedure with 6.
- If the `sccpmsgcnv` parameter value will be changed, continue the procedure with 5.

5. To specify the `sccpmsgcnv` parameter the XUDT UDT Conversion feature must be enabled and turned on.

   If 4 was performed and the `rtrv-ctrl-feat` output in 4 shows that the XUDT UDT Conversion feature is enabled and turned on, continue the procedure by performing one of these steps.

   - If the `ncai` parameter values will not be changed, continue the procedure with 10.
   - If the `ncai` parameter value will be changed, continue the procedure by performing one of these steps.
     - If the current `ncai` parameter value is `no`, continue the procedure with 8.
     - If the current `ncai` parameter value is `yes`, continue the procedure with 6.

   If 4 was performed and the `rtrv-ctrl-feat` output in 4 shows that the XUDT UDT Conversion feature is not enabled and turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

   If 4 was not performed, enter this command to verify the status of the XUDT UDT Conversion feature.

   `rtrv-ctrl-feat:partnum=893035301`

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 15:35:05 GMT  EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
XUDT UDT Conversion       893035301 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

   If the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is enabled and turned on, or the "Activating the XUDT UDT Conversion Feature" procedure was performed in this step, continue the procedure by performing one of these steps.

- If the `ncai` parameter values will not be changed, continue the procedure with 10.
- If the `ncai` parameter value will be changed, continue the procedure by performing one of these steps.
  - If the current `ncai` parameter value is `no`, continue the procedure with 8.
  - If the current `ncai` parameter value is `yes`, continue the procedure with 6.

6. Enter the `rtrv-dstn` command with the cluster point code being changed, but with three asterisks for the network-cluster member value of the cluster point code instead of one asterisk.

   For this example, enter this command.

   `rtrv-dstn:dpca=030-003-***`

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:16:37 GMT EAGLE5 41.0.0

   DPCA           CLLI        BEI ELEI   ALIASI           ALIASN/N24     DMN
   030-003-*      rlghncbb333 yes yes ----------      --------------     SS7
   030-003-100    rlghncbb334 yes no     1-112-3         10-13-10-1      SS7
   030-003-200    rlghncbb335 yes no     1-117-3         10-13-11-1      SS7
   030-003-225    rlghncbb336 yes no  ----------      --------------     SS7

Destination table is (20 of 2000) 1% full
Alias table is (28 of 8000) 1% full
RTRV-DSTN: MASP A - COMPLTD
```

   If the cluster point code does not have any member point codes in the database, continue the procedure with 8.

   If the cluster point code has member point codes in the database, continue the procedure with 7.

7. Display the routes to the members of the cluster point code, shown in 6, in the database using the `rtrv-rte` command with the DPC values shown in 6 for the members of the cluster point code.

   For this example, enter these commands.

   `rtrv-rte:dpca=030-003-100`

   This is an example of the possible output.

```
rlghncxa03w 07-05-07 11:43:04 GMT  EAGLE5 37.0.0

   DPCA            ALIASI      ALIASN/N24     LSN         RC     APCA
   030-003-100     1-112-3     10-13-10-1     ls000300    10     030-003-100

                                                        RTX:No   CLLI=rlghncbb334
```

   `rtrv-rte:dpca=030-003-200`

This is an example of the possible output.

```
rlghncxa03w 07-05-07 11:43:04 GMT  EAGLE5 37.0.0

   DPCA           ALIASI     ALIASN/N24     LSN         RC     APCA
   030-003-200    1-117-3    10-13-11-1     ls000301    10     10
030-003-200

                                               RTX:No
CLLI=rlghncbb335
```

```
rtrv-rte:dpca=030-003-225
```

This is an example of the possible output.

```
rlghncxa03w 07-05-07 11:43:04 GMT  EAGLE5 37.0.0

   DPCA           ALIASI     ALIASN/N24     LSN         RC     APCA
   030-003-225 ---------- --------------    ls000301    10
030-003-300

                                               RTX:No
CLLI=rlghncbb336
```

If the NCAI parameter is being changed from `YES` to `NO`, the routes to the point codes that are members of the cluster point code being changed must be removed from the database. Perform the Removing a Route procedure to remove these routes from the database. For this example, the routes to point codes 030-003-100, 030-003-200, and 030-003-225 must be removed. Continue the procedure with 10.

8. Verify that the nested cluster routing feature is on with the `rtrv-feat` command.

   If the nested cluster routing feature is turned on, the `NCR` field should be set to `on`. In this example, the nested cluster routing feature is off.

   > **Note:**
   >
   > The`rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-feat` command, see the`rtrv-feat` command description in *Commands User's Guide*.

   If the nested cluster routing feature is on, continue the procedure with 10.

   If the nested cluster routing feature is off, continue the procedure with 9.

9. Turn the nested cluster routing feature on by entering this command.

   ```
   chg-feat:ncr=on
   ```

> **Note:**
>
> Once the nested cluster routing feature is turned on with the`chg-feat` command, it cannot be turned off
> The nested cluster routing feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the nested cluster routing features, contact your Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

10. Change the attributes of the cluster point code, using the `chg-dstn` command.

    If the `rcause`, `nprst`, and `splitiam` parameters will be specified for the cluster point code, one or more of the features shown in 4 must be enabled.

    If the `sccpmsgcnv` parameter will be specified for the cluster point code, the XUDT UDT Conversion feature, shown in the `rtrv-ctrl-feat` output in either 4 or 5, must be enabled.

    For this example, enter this command.

    ```
    chg-dstn:dpca=030-003-
    *:clli=ls09clli:ncai=no:elei=no:nprst=on:rcause=5 :splitiam=20:sc
    cpmsgcnv=xudt2udt
    ```

    When this command has successfully completed, this message should appear.

    ```
    rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0

    DESTINATION ENTRIES ALLOCATED:   2000
        FULL DPC(s):                   20
        EXCEPTION DPC(s):               0
        NETWORK DPC(s):                 0
        CLUSTER DPC(s):                 2
        TOTAL DPC(s):                  22
        CAPACITY (% FULL):             1%
    ALIASES ALLOCATED:               8000
        ALIASES USED:                  28
        CAPACITY (% FULL):             1%
    X-LIST ENTRIES ALLOCATED:         500
    CHG-DSTN: MASP A - COMPLTD
    ```

11. Verify the changes using the `rtrv-dstn` command, and specifying the cluster point code that was entered in 10 with the `dpca` parameter.

    For this example, enter this command.

    `rtrv-dstn:dpca=030-003-*`

This is an example of the possible output.

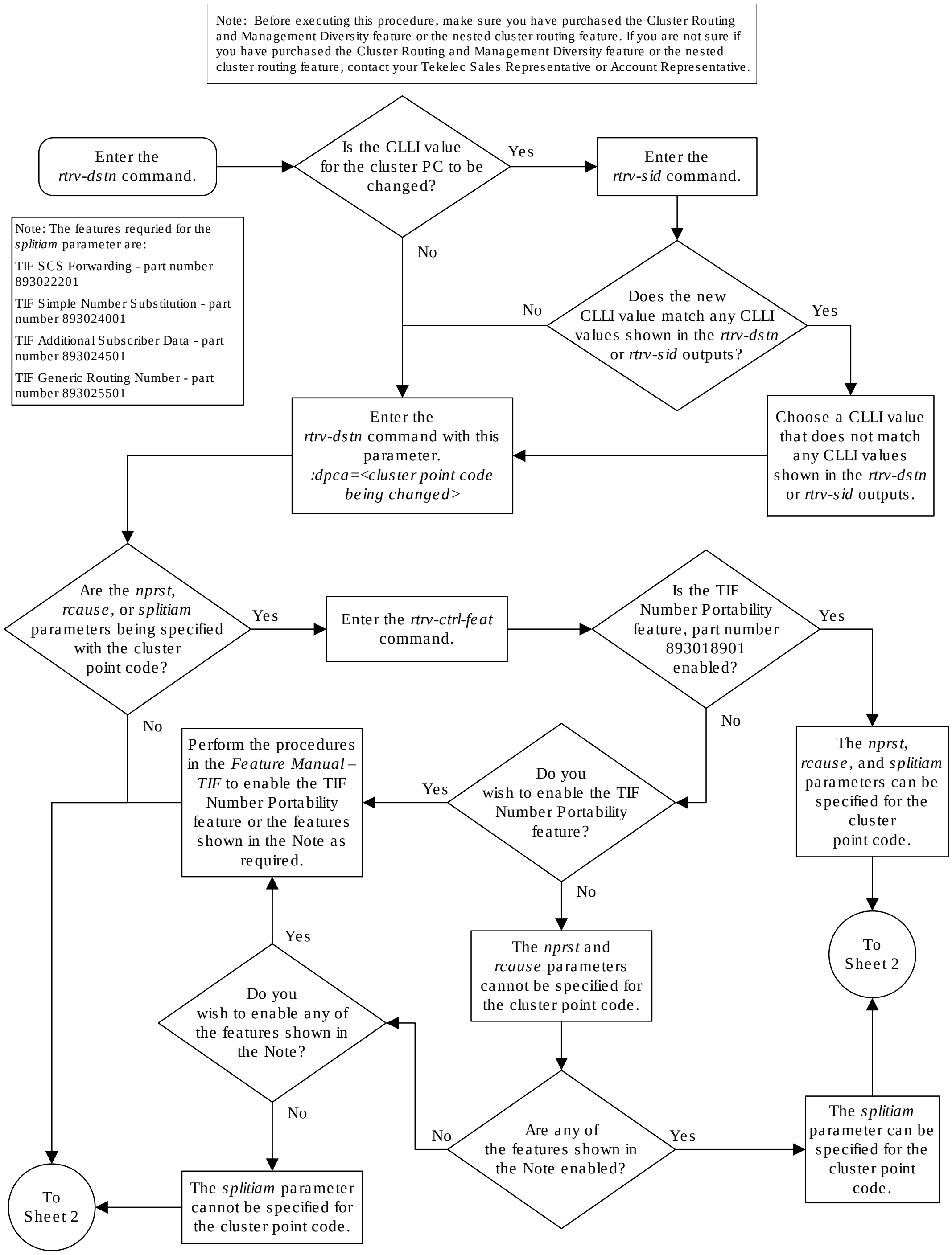
```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI         BEI ELEI   ALIASI
ALIASN/N24    DMN
   030-003-*     ls09clli     yes no  --------------
--------------  SS7

   SPCA         NCAI          RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  no            5      on       20      no     no
xudt2udt

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  22
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  28
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

12. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

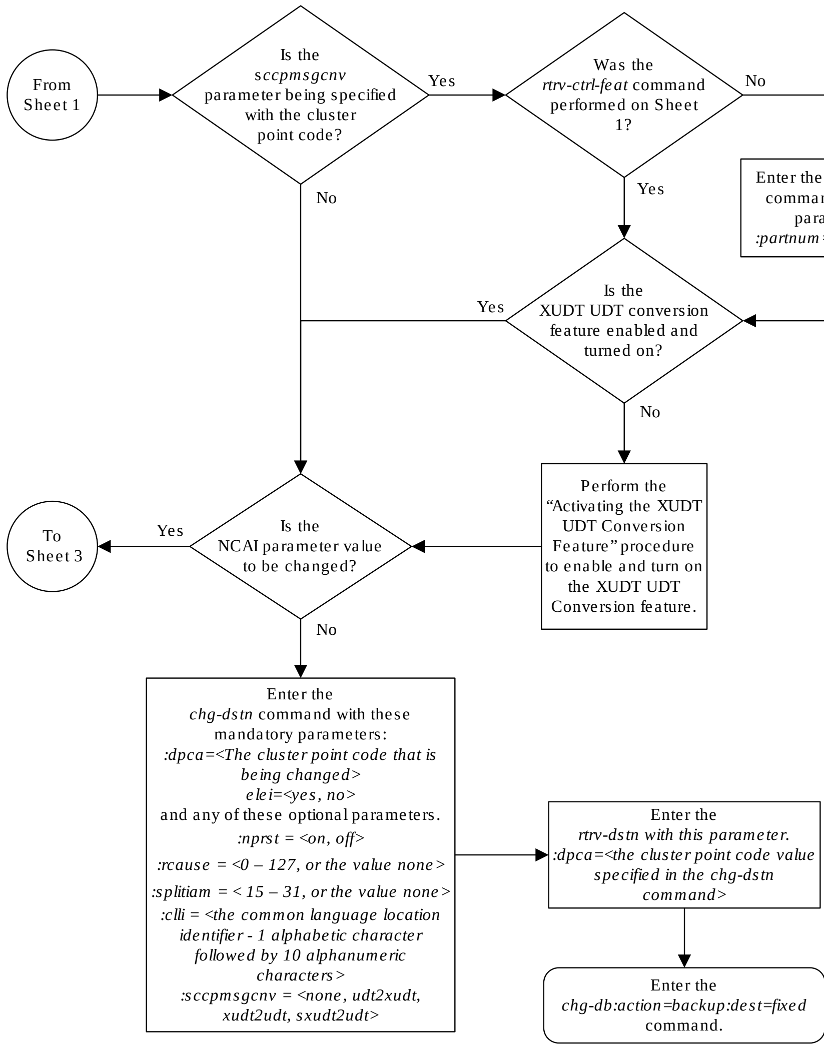
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

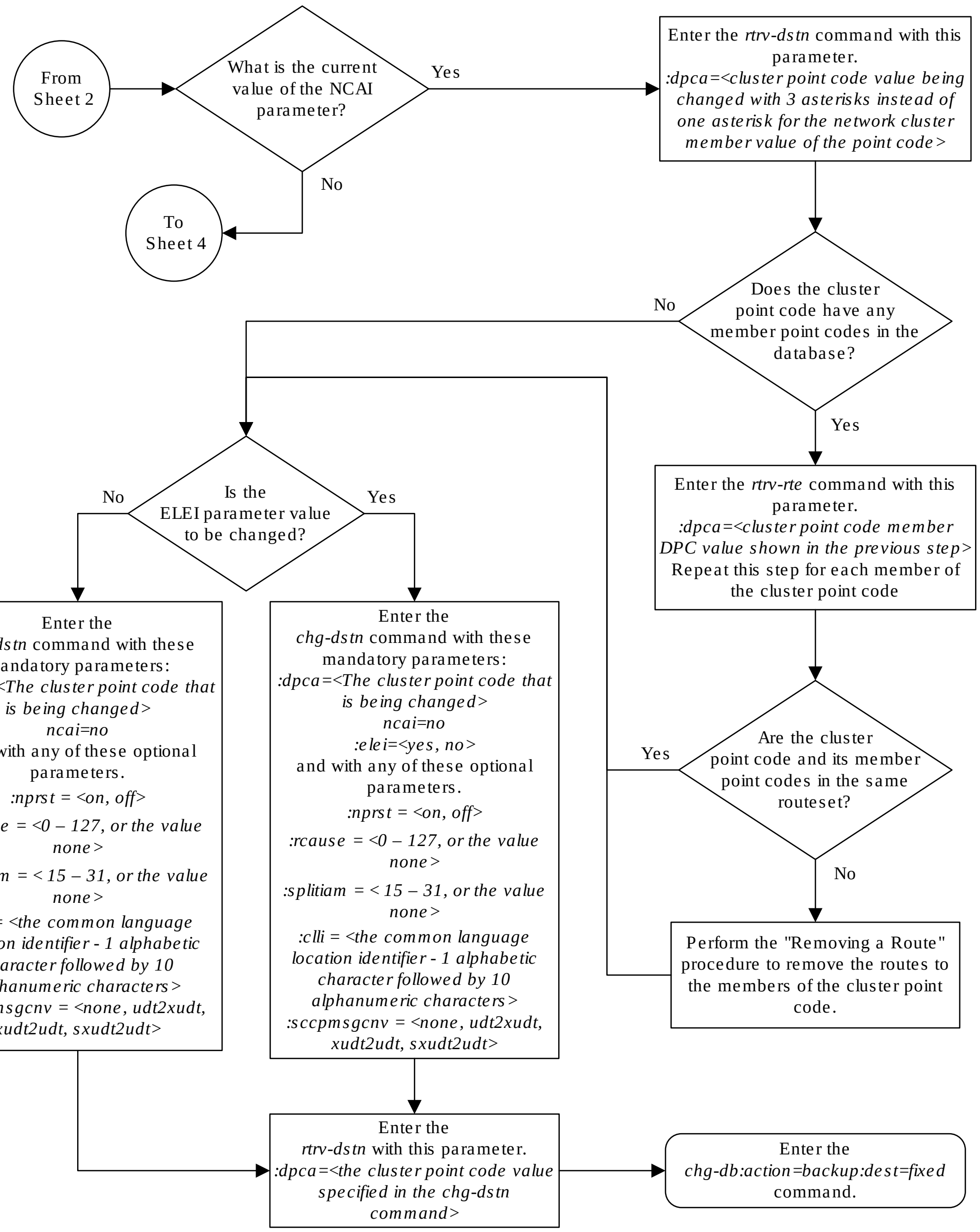
Figure 2-26 Changing the Attributes of a Cluster Point Code



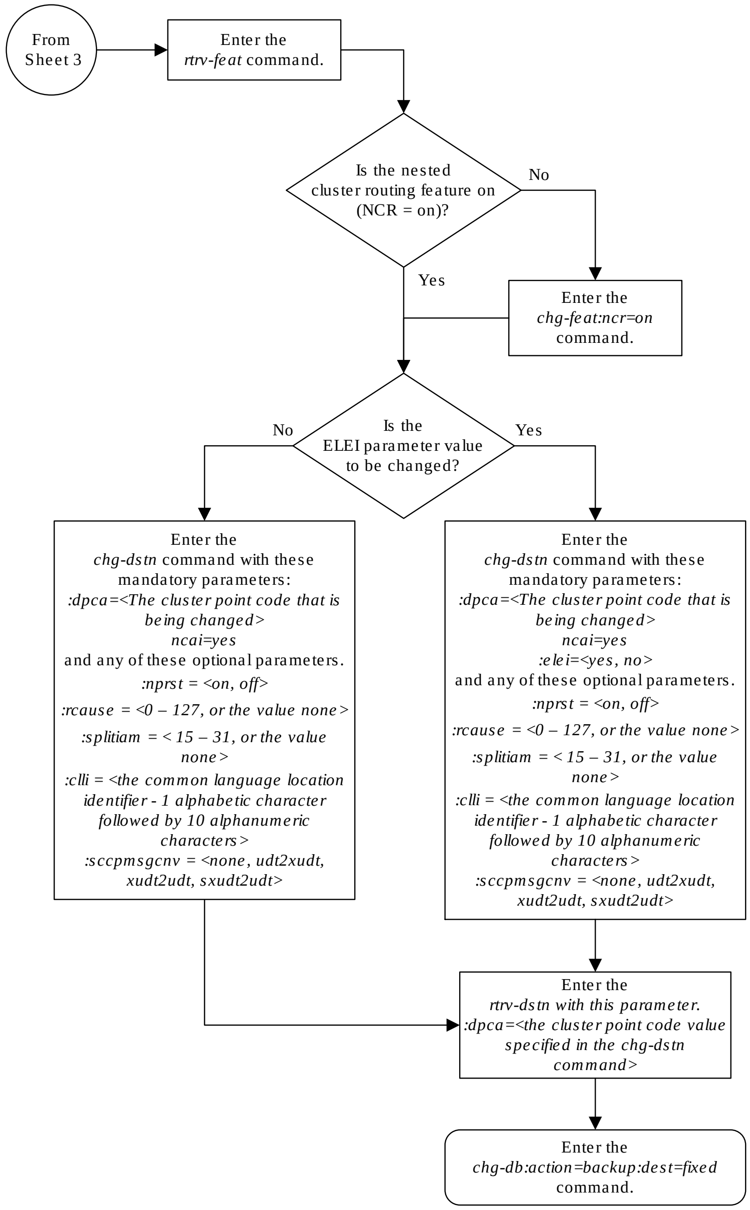
Sheet 1 of 4


From Sheet 1
Is the sccpmsgcnv parameter being specified with the cluster point code?
Yes
No
Was the rtrv-ctrl-feat command performed on Sheet 1?
No
Yes
Enter the rtrv-ctrl-feat command with this parameter. :partnum=893035301
Is the XUDT UDT conversion feature enabled and turned on?
Yes
No
Perform the "Activating the XUDT UDT Conversion Feature" procedure to enable and turn on the XUDT UDT Conversion feature.
Is the NCAI parameter value to be changed?
Yes
No
To Sheet 3
Enter the chg-dstn command with these mandatory parameters:
:dpca=<The cluster point code that is being changed>
elei=<yes, no>
and any of these optional parameters.
:nprst = <on, off>
:rcause = <0 – 127, or the value none>
:splitiam = < 15 – 31, or the value none>
:clli = <the common language location identifier - 1 alphabetic character followed by 10 alphanumeric characters>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
Enter the rtrv-dstn with this parameter.
:dpca=<the cluster point code value specified in the chg-dstn command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 2 of 4


From Sheet 2
What is the current value of the NCAI parameter?
Yes
No
To Sheet 4
Enter the rtrv-dstn command with this parameter.
:dpca=<cluster point code value being changed with 3 asterisks instead of one asterisk for the network cluster member value of the point code>
Does the cluster point code have any member point codes in the database?
No
Yes
Enter the rtrv-rte command with this parameter.
:dpca=<cluster point code member DPC value shown in the previous step>
Repeat this step for each member of the cluster point code
Is the ELEI parameter value to be changed?
No
Yes
Enter the chg-dstn command with these mandatory parameters:
:dpca=<The cluster point code that is being changed>
ncai=no
and with any of these optional parameters.
:nprst = <on, off>
:rcause = <0 – 127, or the value none>
:splitiam = < 15 – 31, or the value none>
:clli = <the common language location identifier - 1 alphabetic character followed by 10 alphanumeric characters>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
Enter the chg-dstn command with these mandatory parameters:
:dpca=<The cluster point code that is being changed>
ncai=no
:elei=<yes, no>
and with any of these optional parameters.
:nprst = <on, off>
:rcause = <0 – 127, or the value none>
:splitiam = < 15 – 31, or the value none>
:clli = <the common language location identifier - 1 alphabetic character followed by 10 alphanumeric characters>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
Are the cluster point code and its member point codes in the same routeset?
Yes
No
Perform the "Removing a Route" procedure to remove the routes to the members of the cluster point code.
Enter the rtrv-dstn with this parameter.
:dpca=<the cluster point code value specified in the chg-dstn command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 3 of 4



Sheet 4 of 4

2.19 Network Routing

Network routing allows the user to provision a single routeset that can used for all **MSUs** destined to members of that network. The advantages of network routing are:

- Reduces the number of entries in the route table
- Allows routing to members of a network without having to add those members to the route table

A **EAGLE** user can connect to a remote network by provisioning a single route table element. As the remote network grows, the **EAGLE** user does not have to add new route table entries for each new point code in the remote network.

> **Note:**
>
> Network routing can be used only with **ANSI** point codes. A network routing point code cannot be provisioned as a proxy point code.

Types of Routing Strategies Available

The **EAGLE** currently allows a user to provision two types of routing strategies:

- Full point code routing
- Network/cluster routing (also called cluster routing)

This feature allows the user to provision a third type of routing strategy, network routing.

It is possible to provision full point code entries, cluster entries, and network entries for members of the same network. Any overlaps in the routing strategies are handled by a specific searching hierarchy.

All of these route table entries can coexist:

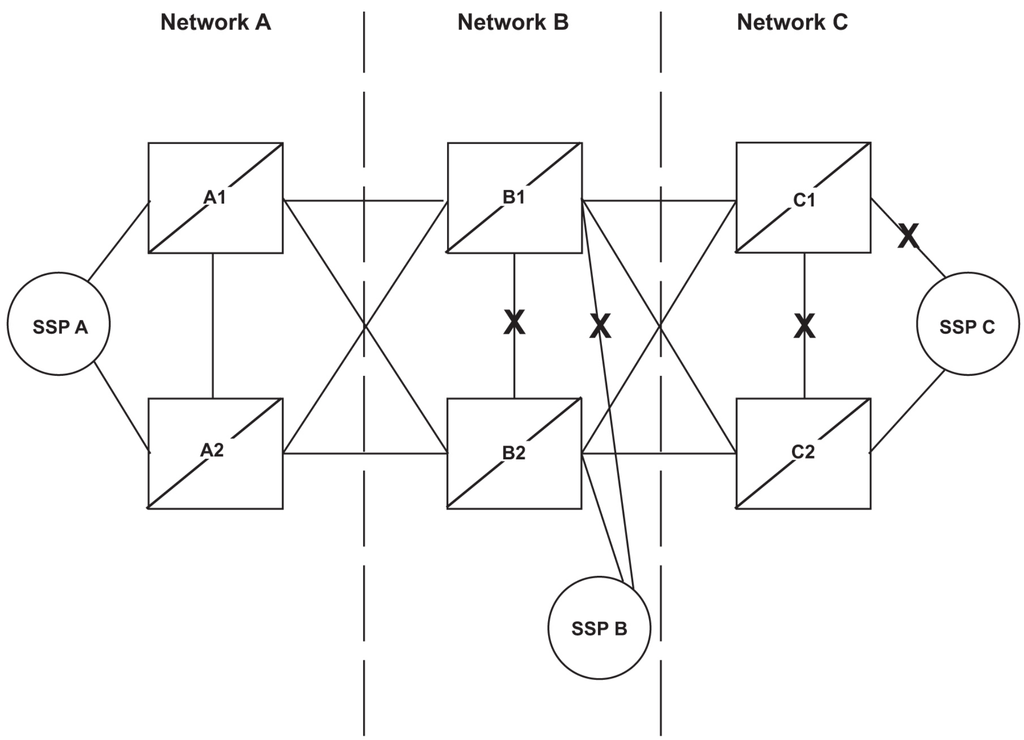
- 8-1-1 – A full point code entry
- 8-1-* – A cluster entry
- 8-*-* – A network entry

The searching hierarchy tries to match against a full point code entry first, followed by a cluster entry, and finally a network entry. In the preceding example, when the **EAGLE** routes an **MSU** destined for 8-1-1, it uses the full point code entry; when the **EAGLE** routes an **MSU** destined for 8-1-2 it uses the cluster entry; and when the **EAGLE** routes an **MSU** destined for 8-2-2, it uses the network entry.

Applications

Network routing is very useful when the destination node is very far away from the source node. The reliability of network routing increases when the destination is further away. Notice that in Figure 2-27, routing from network A is more reliable to nodes in network C than to nodes in network B.

Figure 2-27 Example of Network Routing Reliability



If the nodes in network A use network routing for network C, network A can still route traffic to **SSP** C, even if two linksets fail. In this example, one of the A-linksets to **SSP** C and the C-linkset between node C1 and node C2 fail. In this case, the **EAGLE** in network A continues to route half its traffic to node B1, and half to node B2. Node B1 and node B2 (which do not use network routing) route all traffic for **SSP** C through node C2.

If the nodes in network A use network routing for network B, traffic going to **SSP** B may be lost if two linksets fail. In this example, one of the A-linksets to **SSP** B and the C-linkset between node B1 and node B2 fail. In this case, the **EAGLE** in network A continues to route half its traffic to node B1, and half to node B2. Traffic for **SSP** B routed through node B1 is discarded, resulting in message loss.

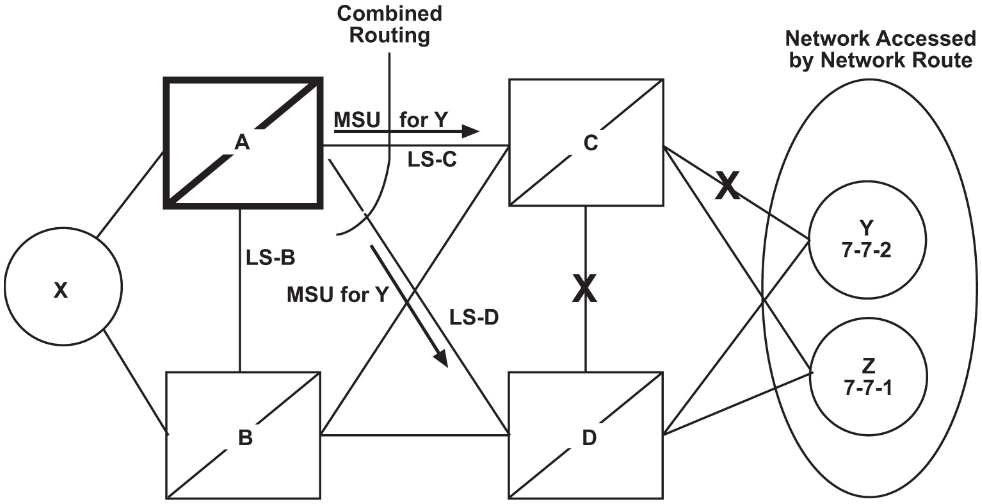
Route Availability

A route is one path to a destination. A routeset is a list of paths to a destination. **Route** availability consists of two parts:

- Local availability
- Remote availability

Remote availability is affected by **TFx** network management messages. Local availability is affected by linkset failures and recoveries. **TFx** messages do not affect point codes accessed by network route entries. Therefore, for network route entries, route availability consists of only local availability. The highest priority linkset available for traffic is used for routing **MSUs**, regardless of the remote availability of that route.

Figure 2-28 Potential Routing Network Failure



In the example in Figure 2-28, linksets **LS**-C and **LS**-D form a combined route to network route 7-*-*. Because 7-*-* is a network route, the **EAGLE** always considers the non-adjacent status of the routes to be allowed. In the example shown, the **EAGLE** routes traffic destined to 7-7-1 over **LS**-C and **LS**-D. The **EAGLE** ignores **TFPs** concerning 7-7-1 or **TCPs** concerning 7-7-*.

Point Code Availability

A point code that is accessed by a network route entry is considered available if there is any linkset in the routeset that is available for traffic.

Local Link Congestion

This feature has no impact on the generation of **TFC** messages. A **TFC** is generated concerning point code X-Y-Z, even if X-Y-Z is routed using a network route entry.

Remote Congestion

Because the **EAGLE** has global title capabilities, it is possible for the **EAGLE** to receive a **TFC** concerning a point code that is accessed by a network route entry. Network route entries are not affected by **TFC** messages.

Broadcast Transfer Messages

The **EAGLE** does not broadcast **TFx** messages for network route entries.

Response Method Transfer Messages

The **EAGLE** sends response method **TFx** messages for network routes as follows:

- Prohibited Network Routes
  If the **EAGLE** receives an **MSU** that is accessed by a network route entry, and that network route is Prohibited, the **EAGLE** sends a response method **TFP** or **TCP** message, as follows:

  - If there is a full point code defined in the same cluster as the **MSU** (for example, 8-*-* and 8-1-1 are defined in the **EAGLE**'s routing table, and **MSU** is destined for 8-1-2), the **EAGLE** sends a **TFP** with concerned point code set to the **MSU**'s **DPC**.
  - Otherwise, the **EAGLE** sends a **TCP** with concerned point code set to the cluster of the **MSU**'s **DPC**.

  The **EAGLE** sends response method **TCPs** or **TFPs** at a rate of one **TCP** or **TFP** per signaling link during the level 3 T8 timer period for each network route.

  For example, in Figure 2-28, the network route for 7-*-* becomes Prohibited due to the failure of **LS**-B, **LS**-C, and **LS**-D. When the **EAGLE** receives an **MSU** from X destined for 7-7-1, the **EAGLE** sends a response method **TCP** concerning 7-7-*. When the **EAGLE** receives an **MSU** from X destined for 7-8-2, the **EAGLE** sends a response method **TCP** concerning 7-8-*.

- System Detects Danger of Circular Routing
  If the **EAGLE** receives an **MSU** that is accessed by a network route entry, and the **EAGLE** detects danger of circular routing, the **EAGLE** sends a response method **TFP** or **TCP** message, as follows:
  - If there is a full point code defined in the same cluster as the **MSU** (for example, 8-*-* and 8-1-1 are defined in the **EAGLE**'s routing table, and the **MSU** is destined for 8-1-2), the **EAGLE** sends a **TFP** with concerned point code set to the **MSU**'s **DPC**.
  - Otherwise, the **EAGLE** sends a **TCP** with concerned point code set to the cluster of the **MSU**'s **DPC**.

  The **EAGLE** sends response method **TCPs** at a rate of one **TCP** per signaling link during the level 3 T8 timer period for each network route.

  For example, in Figure 2-28, all linksets are available. If the **EAGLE** receives an **MSU** from node C destined for 7-7-1, the **EAGLE** detects danger of circular routing, and sends a response method **TCP** concerning 7-7-*. The **EAGLE** also discards the **MSU**.

- **Restricted** Network Routes
  If the **EAGLE** receives an **MSU** that is accessed by a network route entry, and that network route is **Restricted**, the **EAGLE** sends a one-time response method **TFR** or **TCR** message, as follows:
  - If there is a full point code defined in the same cluster as the **MSU** (for example, 8-*-* and 8-1-1 are defined in the **EAGLE**'s routing table, and **MSU** is destined for 8-1-2), the **EAGLE** sends a **TFR** with concerned point code set to the **MSU**'s **DPC**.
  - Otherwise, the **EAGLE** sends a **TCR** with concerned point code set to the cluster of the **MSU**'s **DPC**.

  For example, in Figure 2-28, the network route for 7-*-* becomes **Restricted** due to the failure of **LS**-C and **LS**-D. When the **EAGLE** receives an **MSU** from X destined for 7-7-1, the **EAGLE** sends a response method **TCR** concerning 7-7-*, then routes the **MSU** over **LS**-B. When the **EAGLE** next receives an **MSU** from X destined for 7-8-2, the **EAGLE** does not send a response, and routes the **MSU** over **LS**-B.

Reception of Transfer Messages

The **EAGLE** does not apply received transfer messages to a network route.

For example, in Figure 2-28, if the **EAGLE** receives a **TFP** concerning 7-7-1, it has no effect on the routing status of 7-*-*. The **EAGLE** continues to send **MSUs** destined to 7-*-*, including **MSUs** destined to 7-7-1, on **LS**-C.

As another example, if the **EAGLE** receives a **TCP** concerning 7-8-*, it has no effect on the routing status of 7-*-*. The **EAGLE** continues to send **MSUs** destined to 7-*-*, including **MSUs** destined to 7-8-2, on **LS**-C.

Reception of an RSx Message

If a routeset test (**RSP** or **RSR**) is received, a full point code reply (**TFx**) is generated. The responses to **RSP**/**RSR** have been changed according to Table 2-13. Note that the searching hierarchy applies.

Table 2-13 Reception of an RSx Message

Concerned Point Code is:	Result
Found by a full point code match	No change to existing rules.
Found by a cluster match	No change to existing rules.
Found by a network match	Send a **TFx** message based on the current routeset status. • Send a **TFP** if danger of circular routing. Otherwise: • Send a **TFA** if the network route is Allowed. • Send a **TFR** if the network route is **Restricted**. • Send a **TFP** if the network route is Prohibited.
Not found	No change to existing rules. Send a **TFP**.

Reception of an RCx Message

If a routeset cluster test (**RCP** or **RCR**) is received, a cluster reply (**TCx**) is generated. The responses to **RCP**/**RCR** have been changed according to Table 2-14. Note that the searching hierarchy applies.

Table 2-14 Reception of an RCx Message

Concerned Point Code is:	Result
Found by a cluster match	No change to existing rules.
Found by a network match	Send a **TCx** message based on the current routeset status. • Send a **TCP** if danger of circular routing. Otherwise: • Send a **TCA** if the network route is Allowed. • Send a **TCR** if the network route is **Restricted**. • Send a **TCP** if the network route is Prohibited.
Not found	No change to existing rules. Send a **TCP**.

Administration

The network routing feature must be on, before a network routing point code can be provisioned in the database. This can be verified with the entry `NRT = on` in the output of the `rtrv-feat` command. If the network routing feature is not on, `NRT = off`, it must be turned on with the `chg-feat` command using the `nrt=on` parameter. Once the network routing feature is on, the network routing point code can be provisioned in the database like any other destination point code. Routes can then be assigned to the network routing point code like any other destination point code. For more information on provisioning network routing point codes, see the Adding a Network Routing Point Code procedure.

> **Note:**
>
> Once the network routing feature is turned on using the `chg-feat` command, it cannot be turned off. When using the network routing feature, limited network management is provided for point codes not covered by full point code routing, cluster routing, or nested cluster routing.
> The network routing feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the network routing feature, contact your Oracle Sales Representative or Account Representative.

2.20 Adding a Network Routing Point Code

This procedure is used to add a destination point code to the database, using the `ent-dstn` command.

To change the attributes of an existing network routing point code, perform the Changing a Destination Point Code procedure.

To remove a network routing point code from the database, perform the Removing a Destination Point Code procedure.

The `ent-dstn` command uses these parameters.

`:dpc/dpca` – The destination point code being added to the database

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE. Alias point codes (`aliasi`/`aliasn`/`aliasn24`) and secondary point codes (`spc`/`spca`) cannot be specified for a network routing point code. An **ANSI**private point code must be a full point code.

`:clli` – The **Common Language Location Identifier** assigned to this point code.

`:domain` – The network in which the destination entity or node exists, SS7.

The network routing point code must be in the SS7 domain (`domain=ss7`) and can only be an ANSI point code. **ITU** point codes cannot be specified as network routing point codes.

`:nprst` - NM bits reset. This parameter specifies whether the NM bits in an ITU IAM message should be set to 00. This parameter has two values.

- `off` - Do not set NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
- `on` - Set the NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
  The default value for this parameter is `off`.

`:rcause` - Release cause. This parameter specifies the condition that triggers the sending of a Release message. This parameter has these values.

- 0 - 127
- `none` - use the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.
  The default value for this parameter is `none`.

  If the `rlcopc` parameter value in the `rtrv-tipopts` output is on and a value of 0-127 is specified for the `rcause` parameter, then the `rcause` parameter value overrides the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.

`:splitiam` - This parameter specifies how and when to split an ITU IAM message into one IAM message and one SAM message. This parameter has these values.

- 15-31 - The maximum number of CdPN digits allowed in the IAM message before the splitting occurs. The remaining digits, up to a total of 32, are encoded in the SAM message.
- `none` - the value specified for the `splitiam` parameter in the `rtrv-tifopts` output is used to determine when to split the IAM message.
  The default value for this parameter is `none`.

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501
  The status of these features is shown in the `rtrv-ctrl-feat` output. Perform the procedures in *TIF User's Guide* to enable these features.

`:sccpmsgcnv` - The `sccpmsgcnv` parameter controls SCCP UDT(S)/XUDT(S) message conversion for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. The `rtrv-ctrl-feat` output shows the status of the XUDT UDT Conversion feature. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature. This parameter contains these values.

- none - SCCP UDT(S)/XUDT(S) message conversion is not required on messages for the destination. This value is the default value for this parameter.
- udt2xudt - All UDT(S) messages for the destination are converted to XUDT(S) messages.
- xudt2udt - All non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages. Segmented XUDT(S) messages for the destination are not converted to UDT(S) messages.
- sxudt2udt - All segmented and non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages.

These parameters cannot be specified with a network routing point code.

ncai	spc	elei	bei	ipgwapc	ppc	prx

The `ent-dstn` command also contains the `homescp` and `homesmsc` parameters. The values for these parameters are `yes` and `no`. The value `no` is the default value for these parameters. The value `yes` for these parameters cannot be specified for a network routing point code. To specify the value `yes` for these parameters, perform the Adding a Destination Point Code or Changing a Destination Point Code procedures.

The value of the `clli` parameter cannot be in the DPC table and cannot match the CLLI of the EAGLE. Verify this by entering the `rtrv-dstn` and the `rtrv-sid` commands, shown in 1 and 2. If the value of the `clli` parameter matches any CLLI values in either of these outputs, choose another value for the `clli` parameter that does not match any CLLIs shown in either of these command outputs.

To enter the `dpc`/`dpca` parameter with the `ent-dstn` command, a point code must be defined in the `PCA` field of the self ID of the EAGLE. Verify this with the `rtrv-sid` command.

If no value is shown in the `PCA` field in the `rtrv-sid` command output, the self-identification of the EAGLE must be updated with an ANSI point code. Go to Changing the Self-Identification of the EAGLE procedure to change the self-identification of the EAGLE.

Note:

To enter a network routing point code with the network indicator values 1 through 5, the `pctype` parameter value of the `chg-sid` command must be set to `other`. If you attempt to add a network routing point code with the network indicator values 1 through 5 and the `pctype` parameter value is `ansi`, the `ent-dstn` command will be rejected with this error message.

```
E2169 Cmd Rej: Point code out of range
```

Destination point codes must be unique in the database.

The actual number of destination point codes that can be configured in the database is set by the `mtpdpcq` parameter of the `chg-stpopts` command, and is shown in the `MTPDPCQ` field in the `rtrv-stpopts` command output.

If the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled, a maximum of 2000 destination point codes can be configured in the database.

If the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled, a maximum of 5000 destination point codes can be configured in the database.

If 6000 routesets are enabled, a maximum of 6000 destination point codes can be configured in the database.

If 7000 routesets are enabled, a maximum of 7000 destination point codes can be configured in the database.

If 8000 routesets are enabled, a maximum of 8000 destination point codes can be configured in the database.

If 10,000 routesets are enabled, a maximum of 10,000 destination point codes can be configured in the database.

> **Note:**
>
> For more information on the destination point code quantities, refer to the Changing the DPC Quantity procedure.

The examples in this procedure are used to add the network routing point code `007-*-*` to the database.

Canceling the `RTRV-DSTN` Command

Because the `rtrv-dstn` command used in this procedure can output information for a long period of time, the `rtrv-dstn` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` command can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` command was entered, from another terminal other than the terminal where the `rtrv-dstn` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current destination point codes using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
```

```
   001-002-003   ls04clli    yes --- ----------
--------------   SS7
   030-045-*     rlghncbb010 yes yes ----------
--------------   SS7
   111-011-*     rlghncbb000 yes yes ----------
--------------   SS7
   240-012-004   rlghncbb001 yes ---    1-111-1
10-13-9-3     SS7
   240-012-005   rlghncbb002 yes ---    1-112-2
10-13-10-0    SS7
   240-012-006   rlghncbb003 yes ---    1-112-3
10-13-10-1    SS7
   240-012-008   ----------- yes ---    1-113-5
10-13-10-2    SS7

   DPCI          CLLI        BEI ELEI   ALIASA
ALIASN/N24    DMN
   2-131-1       rlghncbb023 no  ---    222-210-000
11-11-8-1     SS7
   2-131-2       ----------- no  ---    222-211-001
11-11-8-2     SS7
   2-131-3       ----------- no  ---    222-211-002
11-11-8-3     SS7

   DPCN          CLLI        BEI ELEI   ALIASA
ALIASI        DMN
   10-15-2-3     rlghncbb013 no  ---    222-200-200
2-121-1       SS7
   10-15-3-0     rlghncbb013 no  ---    222-200-201
2-121-2       SS7


DESTINATION ENTRIES ALLOCATED:   6000
    FULL DPC(s):                   14
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  16
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  18
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If the addition of the network routing point code will not exceed the current DPC capacity shown in the `rtrv-dstn` output, continue the procedure with 2.

If the addition of the network routing point code will exceed the current DPC capacity, and the current capacity is less than 10,000 (or 10,500 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` fields are shown in the `rtrv-dstn` output), perform the Changing the DPC Quantity procedure to change the DPC quantity. Continue the procedure with 2.

If the addition of the network routing point code will exceed the current DPC capacity, and the current capacity is 10,000 (or 10,500 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` fields are shown in the `rtrv-dstn` output), perform the Removing a Destination Point Code procedure to remove a DPC or perform the Removing a Route Exception Entry procedure to remove an exception route. Continue the procedure with 2.

2. Verify that the network routing feature is on, by entering the `rtrv-feat` command.

   If the network routing feature is on, the `NRT` field should be set to `on`. For this example, the network routing feature is off.

   > **Note:**
   >
   > The`rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-feat` command, see the`rtrv-feat` command description in *Commands User's Guide*.

   If the network routing feature is on, continue the procedure with 4.

3. If the network routing feature is not on, shown by the `NRT = off` entry in the `rtrv-feat` command output of 2, turn the network routing feature on by entering this command.

   `chg-feat:nrt=on`

   > **Note:**
   >
   > Once the network routing feature is turned on with the`chg-feat` command, it cannot be turned off.
   > The network routing feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the network routing feature, contact your Oracle Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 00:57:31 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

   Continue the procedure by performing one of these steps.

   - If you wish to enter a network routing point code with the network indicator values 1 through 5, and the network indicator values 1 through 5 are not shown in the `rtrv-dstn` output in 1, perform 4 to verify the `pctype` value.
   - If ANSI point codes are not shown in the `rtrv-dstn` output in 1, perform 4 to verify that an ANSI point code is assigned to the self-identification of the EAGLE.

- If the `rtrv-dstn` output in 1 shows ANSI point codes or shows ANSI point codes that contain the network indicator values 1 through 5, or you do not wish to provision a network routing point code with the network indicator values 1 through 5, continue the procedure by performing one of these steps.
  - If the `nprst`, `rcause`, or `splitiam` parameters will not be specified for the cluster point code, continue the procedure with 6.
  - If the `nprst`, `rcause`, or `splitiam` parameters will be specified for the cluster point code, continue the procedure with 5.

4. Display the self-identification of the EAGLE using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT  EAGLE5 37.0.0

   PCA               PCI           PCN
CLLI               PCTYPE
   100-100-100      3-75-7        7-9-8-1
rlghncxa03w        OTHER

   CPCA
   002-002-002        002-002-003        002-002-004       002-002-005
   002-002-006        002-002-007        002-002-008       002-002-009
   004-002-001        004-003-003        050-060-070

   CPCA (LNP)
   005-005-002        005-005-004        005-005-005

   CPCI
   1-002-1            1-002-2            1-002-3           1-002-4
   2-001-1            7-222-7

   CPCN
   2-0-10-3           2-0-11-0           2-0-11-2          2-0-12-1
   2-2-3-3            2-2-4-0            10-14-10-1
```

   To enter an ANSI destination point code with the `ent-dstn` command, a point code must be shown in the `PCA` field of the `rtrv-sid` command output.

   If the required point code is not shown in the `PCA` field of the `rtrv-sid` command output, perform the Changing the Self-Identification of the EAGLE procedure to configure the required point codes.

   To enter a network routing point code with the network indicator values 1 through 5, the `pctype` parameter value of the `chg-sid` command must be set to `other`. If you wish to enter a network routing point code with a network indicator value 1 through 5, and the `pctype` parameter value is `ansi`, perform the Changing the Self-Identification of the EAGLE procedure to change the `pctype` value to `other`.

   Continue the procedure by performing one of these steps.

   - If the `nprst`, `rcause`, or `splitiam` parameters will not be specified for the cluster point code, continue the procedure with 6 .

- If the `nprst`, `rcause`, or `splitiam` parameters will be specified for the cluster point code, continue the procedure with 5.

5. Display the features that are enabled by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 09-05-17 15:35:05 GMT  EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
HC-MIM SLK Capacity       893012707 on     64
TIF Number Portability    893018901 off    ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

   - TIF Number Portability - part number 893018901
   - TIF SCS Forwarding - part number 893022201
   - TIF Simple Number Substitution - part number 893024001
   - TIF Additional Subscriber Data - part number 893024501
   - TIF Generic Routing Number - part number 893025501

   Perform the procedures in *TIF User's Guide* to enable these features as required.

6. Continue the procedure by performing one of these steps.
   - Continue the procedure with 8 if any of these conditions are present.
     – The `sccpmsgcnv` parameter will not be specified for the cluster point code.
     – The `sccpmsgcnv` parameter will be specified for the cluster point code and the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is enabled and turned on. If the `rtrv-ctrl-feat` output in this step shows that the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT* to enable and turn on the XUDT UDT Conversion feature.
   - Continue the procedure with 7 if the `sccpmsgcnv` parameter will be specified for the cluster point code and 5 was not performed.

7. Enter this command to verify the status of the XUDT UDT Conversion feature.

`rtrv-ctrl-feat:partnum=893035301`

This is an example of the possible output.

```
rlghncxa03w 10-12-17 15:35:05 GMT  EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
XUDT UDT Conversion       893035301 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

If the XUDT UDT Conversion feature is enabled and turned on, or the "Activating the XUDT UDT Conversion Feature" procedure was performed in this step, continue the procedure with 8.

8. Add the network routing destination point code, using the `ent-dstn` command.

   For this example, enter this command.

   `ent-dstn:dpca=007-*-*:rcause=50:nprst=on:splitiam=25:sccpmsgcnv=sxudt2udt`

   When this command has successfully completed, and the Cluster Routing and Management Diversity feature is turned off (shown with the `CRMD = off` entry in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
Destination table is (17 of 2000) 1% full
ENT-DSTN: MASP A - COMPLTD
```

   If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), this message should appear when each command has successfully completed.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
DESTINATION ENTRIES ALLOCATED:   6000
```

```
    FULL DPC(s):                   14
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  17
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  18
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
ENT-DSTN: MASP A - COMPLTD
```

9. Verify the changes using the `rtrv-dstn` command and specifying the DPC that was entered in 8.

   For this example, enter this command.

   `rtrv-dstn:dpca=007-*-*`

   This is an example of the possible output.

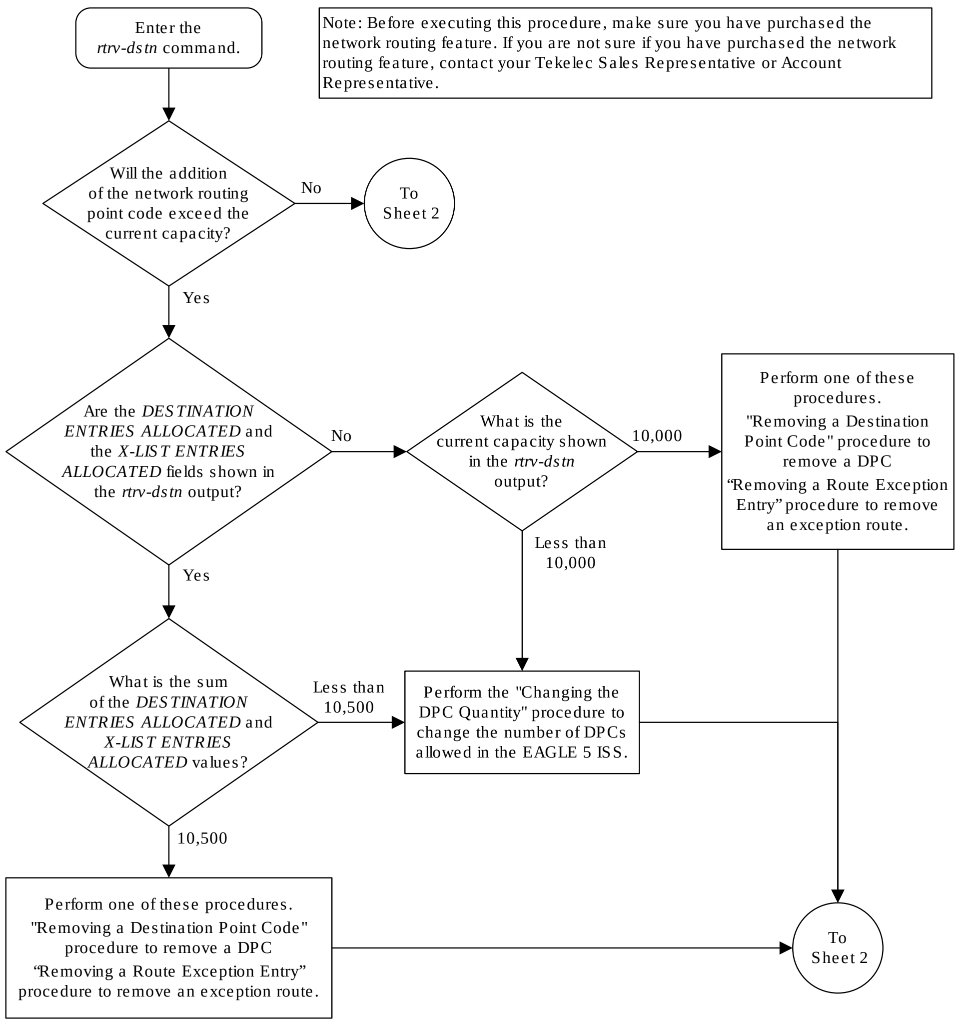
```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   007-*-*        ----------- yes --- ----------      --------------    SS7

   SPCA          NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------   ----         50     on    25       no     no    sxudt2udt

Destination table is (14 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

10. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

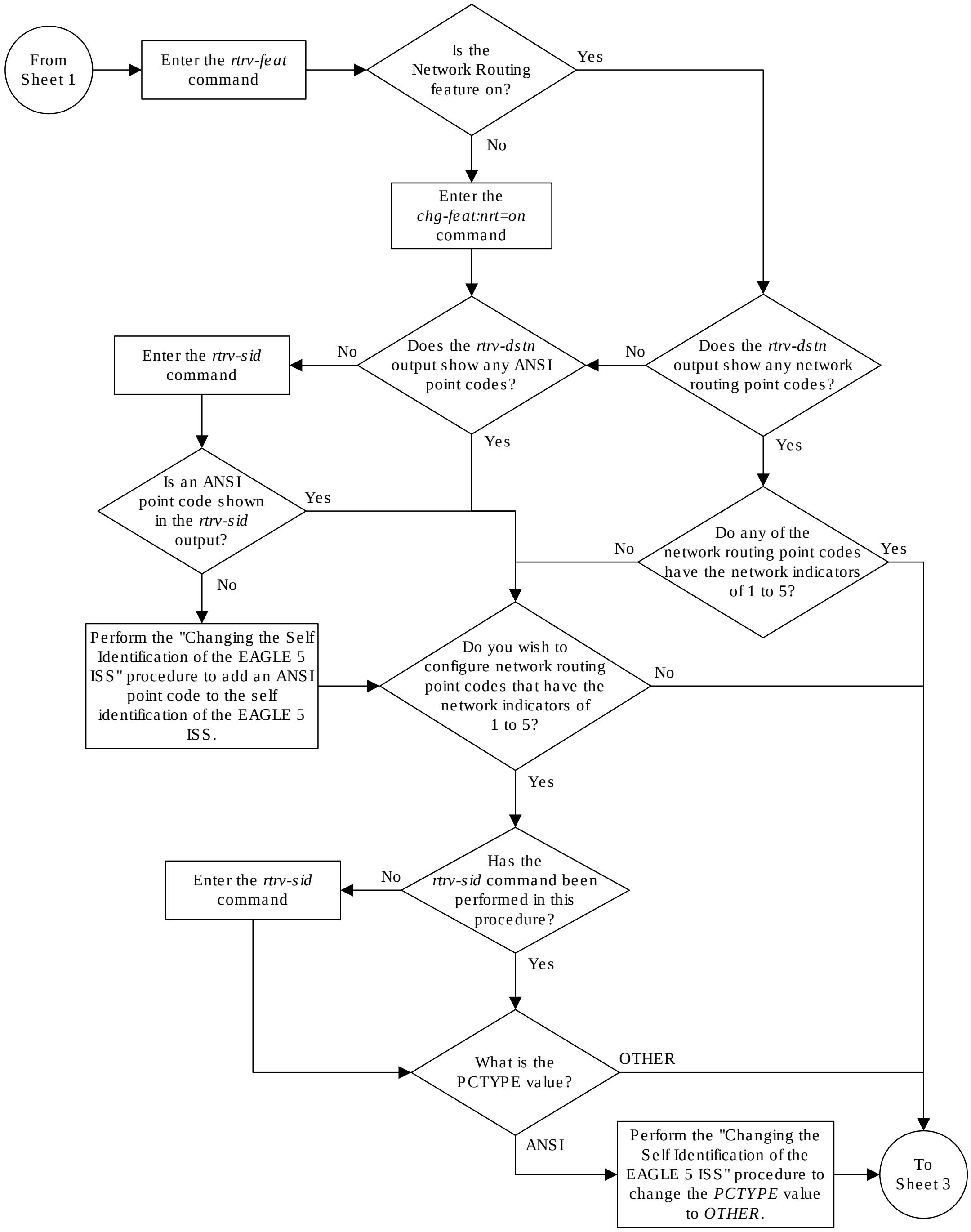
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

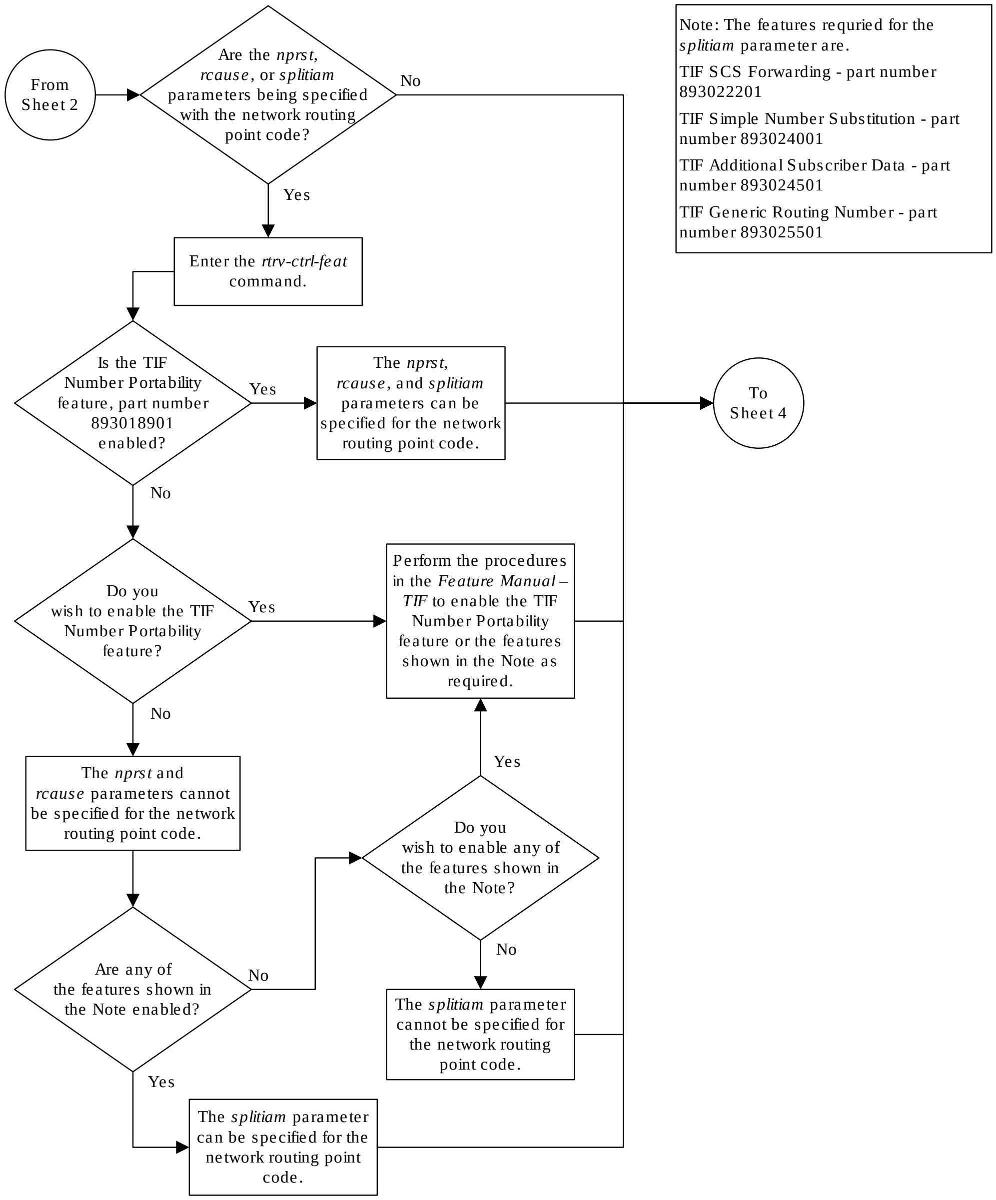
Figure 2-29 Adding a Network Routing Point Code



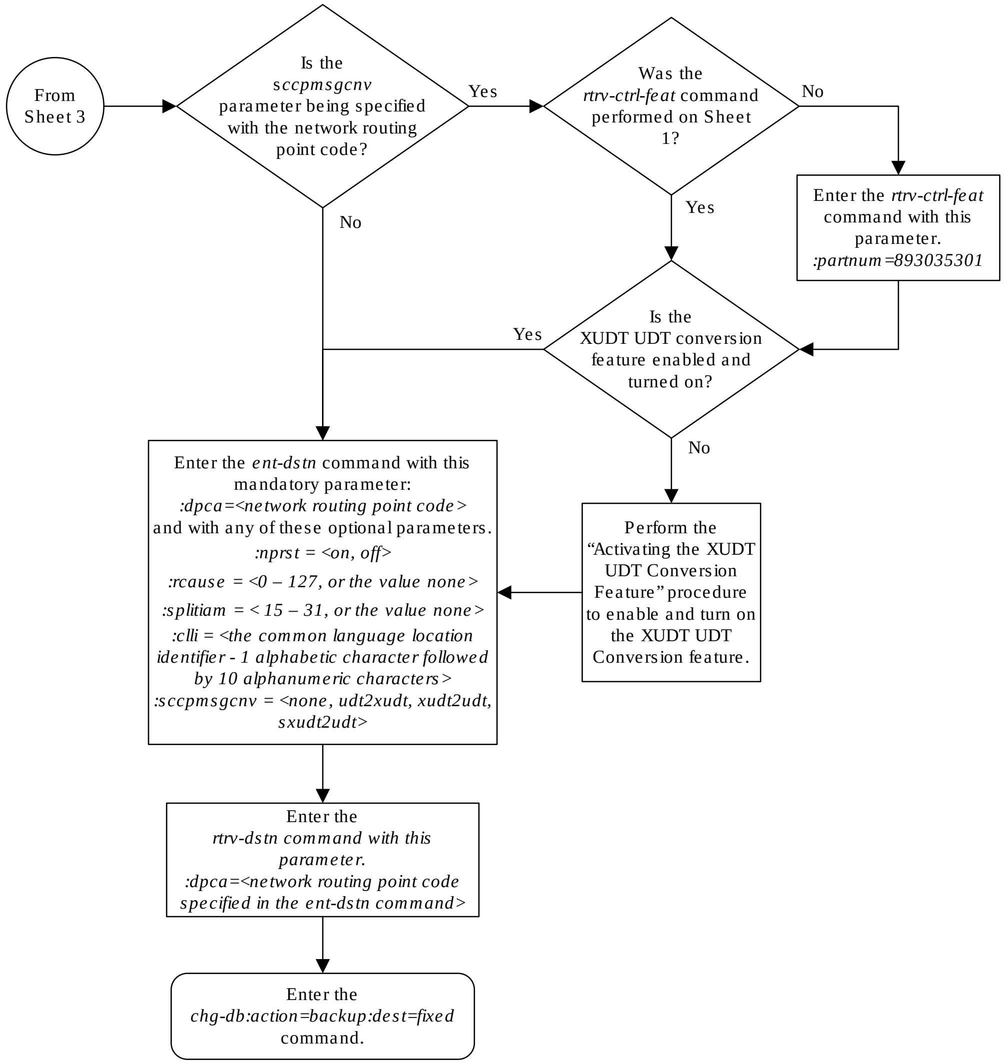
Sheet 1 of 4


From Sheet 1
Enter the rtrv-feat command
Is the Network Routing feature on?
Yes
No
Enter the chg-feat:nrt=on command
Does the rtrv-dstn output show any network routing point codes?
No
Yes
Does the rtrv-dstn output show any ANSI point codes?
No
Yes
Enter the rtrv-sid command
Is an ANSI point code shown in the rtrv-sid output?
Yes
No
Perform the "Changing the Self Identification of the EAGLE 5 ISS" procedure to add an ANSI point code to the self identification of the EAGLE 5 ISS.
Do any of the network routing point codes have the network indicators of 1 to 5?
No
Yes
Do you wish to configure network routing point codes that have the network indicators of 1 to 5?
No
Yes
Has the rtrv-sid command been performed in this procedure?
No
Yes
Enter the rtrv-sid command
What is the PCTYPE value?
OTHER
ANSI
Perform the "Changing the Self Identification of the EAGLE 5 ISS" procedure to change the PCTYPE value to OTHER.
To Sheet 3

Sheet 2 of 4


From Sheet 2
Are the *nprst*, *rcause*, or *splitiam* parameters being specified with the network routing point code?
No
Yes
Enter the *rtrv-ctrl-feat* command.
Is the TIF Number Portability feature, part number 893018901 enabled?
Yes
The *nprst*, *rcause*, and *splitiam* parameters can be specified for the network routing point code.
To Sheet 4
No
Do you wish to enable the TIF Number Portability feature?
Yes
Perform the procedures in the *Feature Manual – TIF* to enable the TIF Number Portability feature or the features shown in the Note as required.
No
The *nprst* and *rcause* parameters cannot be specified for the network routing point code.
Yes
Do you wish to enable any of the features shown in the Note?
No
Are any of the features shown in the Note enabled?
No
The *splitiam* parameter cannot be specified for the network routing point code.
Yes
The *splitiam* parameter can be specified for the network routing point code.
Note: The features requried for the *splitiam* parameter are.
TIF SCS Forwarding - part number 893022201
TIF Simple Number Substitution - part number 893024001
TIF Additional Subscriber Data - part number 893024501
TIF Generic Routing Number - part number 893025501

Sheet 3 of 4



Sheet 4 of 4

2.21 Adding a Destination Point Code

This procedure is used to add a destination point code to the database, using the `ent-dstn` command.

The `ent-dstn` command uses these parameters:

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code being added to the database

`:aliasa/aliasi/aliasn/aliasn24` – The alternate destination point code. Two optional alias addresses can be defined.

`:ppc/ppca/ppci/ppcn/ppcn24` – The proxy point code that is assigned to the destination point code.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes. A private point code cannot be used as an alias point code.

`:clli` – The **Common Language Location Identifier** assigned to this point code

`:domain` – The network in which the destination entity or node exists, SS7.

`:ipgwapc` – **IP** Gateway **Adjacent Point Code** indicator. Specify `ipgwapc=yes` to provide SS7 linkset definition compatibility for gateway connections to IP-**SCPs**. The default is `ipgwapc=no`.

`:bei` – Broadcast exception indicator that indicates whether transfer-prohibited (**TFP**) messages will be broadcast from this node. The `bei=yes` parameter means TFPs will not be broadcast. The `bei=no` parameter means TFPs will be broadcast.

`:spc/spca/spci/spcn/spcn24` – The secondary point code as defined by the `ent-spc` command. The secondary point code allows the EAGLE to use another point code in addition to the one defined by the `dpc`, `dpca`, `dpci`, `dpcn`, or `dpcn24` parameters of the `ent-dstn` command for SS7 routing purposes. Refer to the Multiple Point Code Support section for more information on secondary point codes. A private point code cannot be used as a secondary point code.

`:prx` – This parameter specified whether or not the destination point code is proxy point code. This parameter has two values, `yes` or `no`. If the `prx` parameter value is `yes`, the destination point code is a proxy point code. If the `prx` parameter value is `no`, the destination point code is not a proxy point code.

The `ppc` and `prx` parameters can be specified only if a quantity of proxy point codes is enabled. Proxy point code quantities are enabled in groups of 10. The enabled quantity of proxy point codes is shown in the `rtrv-ctrl-feat` output. If no proxy point code quantity is shown in the `rtrv-ctrl-feat` output, or the proxy point code quantity needs to be increased, up to a maximum quantity of 100 proxy point codes, perform the Changing the Proxy Point Code Quantity procedure.

The `ppc` parameter assigns a proxy point code to a destination point code. The proxy point code value must be provisioned in the database. The destination point code must be a full point code, in the SS7 domain, and cannot be a private point code. The destination point code cannot have the `ipgwapc=yes` parameter value assigned. The destination point code and proxy point code must be the same network type. For example, if the destination point code is an ANSI point code, the proxy point code must be an ANSI point code. If the destination point code and proxy point code are 14-bit ITU-N point codes with a group code, the group code values for both the destination point code and the proxy point code must be the same. The spc and ppc parameters cannot be specified together in the same ent-dstn command line.

The prx parameter specifies whether or not the destination point code specified with the ent-dstn command is a proxy point code. The destination point code value must be a full point code, in the SS7 domain, and cannot be a private point code. The destination point code value cannot have the ipgwapc=yes parameter value assigned.

:nprst - NM bits reset. This parameter specifies whether the NM bits in an ITU IAM message should be set to 00. This parameter has two values.

- off - Do not set NM bits to 00 in an ITU IAM message if the nptype option value in the rtrv-tifopts output is nm.
- on - Set the NM bits to 00 in an ITU IAM message if the nptype option value in the rtrv-tifopts output is nm.
  The default value for this parameter is off.

:rcause - Release cause. This parameter specifies the condition that triggers the sending of a Release message. This parameter has these values.

- 0 - 127
- none - use the values specified for the rcausenp and rcausepfx parameters in the rtrv-tifopts output.
  The default value for this parameter is none.

  If the rlcopc parameter value in the rtrv-tipopts output is on and a value of 0-127 is specified for the rcause parameter, then the rcause parameter value overrides the values specified for the rcausenp and rcausepfx parameters in the rtrv-tifopts output.

:splitiam - This parameter specifies how and when to split an ITU IAM message into one IAM message and one SAM message. This parameter has these values.

- 15-31 - The maximum number of CdPN digits allowed in the IAM message before the splitting occurs. The remaining digits, up to a total of 32, are encoded in the SAM message.
- none - the value specified for the splitiam parameter in the rtrv-tifopts output is used to determine when to split the IAM message.
  The default value for this parameter is none.

To specify the nprst or rcause parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the splitiam parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201
- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501
  The status of these features is shown in the rtrv-ctrl-feat output. Perform the procedures in *TIF User's Guide* to enable these features.

:homescp - This parameter specifies whether the destination point code should be considered a home **SCP** when performing SCCP processing for messages that have no global title address digits (the global title indicator (GTI) is set to zero). This parameter cannot be specified for a cluster point code or a network routing point code. These are the values for this parameter.

- yes- the specified DPC is considered a home SCP.
- no - the specified DPC is not considered a home SCP. This is the default value.

`:homesmsc` - This parameter specifies whether the destination point code (DPC) should be considered a home **SMSC** when performing SCCP processing for messages that have no global title address digits (the global title indicator (GTI) is set to zero). This parameter cannot be specified for a cluster point code or a network routing point code. These are the values for this parameter.

- yes- the specified DPC is considered a home SMSC.
- no - the specified DPC is not considered a home SMSC. This is the default value.

`:sccpmsgcnv` - The `sccpmsgcnv` parameter controls SCCP UDT(S)/XUDT(S) message conversion for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. The `rtrv-ctrl-feat` output shows the status of the XUDT UDT Conversion feature. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature. This parameter contains these values.

- none - SCCP UDT(S)/XUDT(S) message conversion is not required on messages for the destination. This value is the default value for this parameter.
- udt2xudt - All UDT(S) messages for the destination are converted to XUDT(S) messages.
- xudt2udt - All non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages. Segmented XUDT(S) messages for the destination are not converted to UDT(S) messages.
- sxudt2udt - All segmented and non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages.

The `elei` and `ncai` parameters cannot be specified in this procedure. To use these parameters to provision a destination point code, perform the Adding a Cluster Point Code procedure.

Secondary point codes must be a full point code. A secondary point code can only be assigned to a full point code. The network type of the secondary point code must match the network type of the **DPC**. The secondary point code used in this procedure must be configured in the database with the `ent-spc` command. The secondary point codes are shown in the `SPCA`, `SPC-I`, `SPC-N`, and `SPC-N24` fields of the `rtrv-spc` command output. If the desired secondary point code is not shown in the output of the `rtrv-spc` command, perform the Adding a Secondary Point Code procedure to configure the desired point code as a secondary point code.

The value of the `clli` parameter cannot be in the **DPC** table and cannot match the **CLLI** of the EAGLE. Verify this by entering the `rtrv-dstn` and the `rtrv-sid` commands, shown in steps 1 and 5 of the procedure that follows. If the value of the `clli` parameter matches any CLLI values in either of these outputs, choose another value for the `clli` parameter that does not match any CLLIs shown in either of these command outputs.

To enter point codes of any network type (**ANSI**, ITU-I, 14-bit ITU-N, or 24-bit ITU-N) into the database with the `ent-dstn` command, the self **ID** of the EAGLE must be defined for these networks. Verify this with the `rtrv-sid` command.

If a point code value is shown in the `PCA` column of the `rtrv-sid` command, then ANSI point codes can be specified with the `ent-dstn` command.

If a point code value is shown in the `PCI` column of the output of the `rtrv-sid` command, then ITU-I point codes can be specified with the `ent-dstn` command. The `PCI` column of the `rtrv-sid` output can contain spare and non-spare point code values. To provision ITU-I non-spare point codes in this procedure, the `rtrv-sid` output must contain an ITU-I non-spare point code in the `PCI` column. To provision ITU-I spare point codes in this procedure, the `rtrv-sid` output must contain an ITU-I spare point code in the `PCI` column.

If a point code value is shown in the `PCN` column of the output of the `rtrv-sid` command, then 14-bit ITU-N point codes can be specified with the `ent-dstn` command. The `PCN` column of the `rtrv-sid` output can contain spare and non-spare point code values. To provision 14-bit ITU-N non-spare point codes in this procedure, the `rtrv-sid` output must contain a 14-bit ITU-N non-spare point code in the `PCN` column. To provision 14-bit ITU-N spare point codes in this procedure, the `rtrv-sid` output must contain a 14-bit ITU-N spare point code in the `PCN` column.

If a point code value is shown in the `PCN24` column of the output of the `rtrv-sid` command, then 24-bit ITU-N point codes can be specified with the `ent-dstn` command.

If no values are shown in the `PCA`, `PCI`, `PCN`, or `PCN24` columns in the `rtrv-sid` command output, the self-identification of the EAGLE must be updated with an ANSI point code, ITU international point code, 14-bit ITU national point code, or a 24-bit ITU national point code. Perform the Adding a Point Code to the Self-Identification of the EAGLE procedure to add the necessary point codes to the self-identification of the EAGLE.

> **Note:**
>
> The EAGLE can contain 14-bit ITU national point codes or 24-bit ITU national point codes, but both at the same time.

Private point codes cannot be specified in the self-identification of the EAGLE, therefore, private point codes can be added as long as the self identification of the EAGLE contains a point code with the same network type as the private point code being added in this procedure. The ITU National and International **Spare Point Code** Support feature does not have to be enabled to add a private point code. A proxy point code cannot be used as a value when specifying a private point code.

The type of alias point code that can be provisioned with the `ent-dstn` command is dependent on the type of DPC that is being provisioned. Table 2-15 shows the DPC and alias point type combinations that can be used with the `ent-dstn` command.

Table 2-15 Destination Point Code Type and Alias Point Code Type Combinations

DPC Type	Alias Point Code Type (See Notes 1 - 4)	Alias Point Code Type (See Notes 1 - 4)	DPC TYPE	Alias Point Code Type (See Notes 1 - 4)	Alias Point Code Type (See Notes 1 - 4)
ANSI	no alias specified	no alias specified	**ITU-I**	no alias specified	no alias specified
	ITU-I	no alias specified		ANSI	no alias specified
	ITU-I	ITU-N		ANSI	ITU-N
	ITU-I	ITU-N Spare		ANSI	ITU-N Spare
	ITU-I	ITU-N24		ANSI	ITU-N24
	ITU-I Spare	no alias specified		ITU-I Spare	no alias specified
	ITU-I Spare	ITU-N		ITU-I Spare	ITU-N
	ITU-I Spare	ITU-N Spare		ITU-I Spare	ITU-N Spare
	ITU-I Spare	ITU-N24		ITU-I Spare	ITU-N24
	ITU-N	no alias specified		ITU-N	no alias specified
	ITU-N Spare	no alias specified		ITU-N (Note 6)	ITU-N Spare (Note 6)
	ITU-N24	no alias specified		ITU-N Spare	no alias specified
ITU-I Spare	no alias specified	no alias specified		ITU-N24	no alias specified
	ANSI	no alias specified	**ITU-N**	no alias specified	no alias specified
	ANSI	ITU-N		ANSI	no alias specified
	ANSI	ITU-N Spare		ANSI	ITU-I
	ANSI	ITU-N24		ANSI	ITU-I Spare
	ITU-I	no alias specified		ITU-I	no alias specified
	ITU-I	ITU-N		ITU-I (Note 5)	ITU-I Spare (Note 5)
	ITU-I	ITU-N Spare		ITU-I Spare	no alias specified
	ITU-I	ITU-N24		ITU-N Spare	no alias specified
	ITU-N	no alias specified		ITU-N Spare	ITU-I
	ITU-N (Note 6)	ITU-N Spare (Note 6)		ITU-N Spare	ITU-I Spare
	ITU-N Spare	no alias specified	**ITU-N24**	no alias specified	no alias specified
	ITU-N24	no alias specified		ANSI	no alias specified
ITU-N Spare	no alias specified	no alias specified		ANSI	ITU-I

Table 2-15 (Cont.) Destination Point Code Type and Alias Point Code Type Combinations

DPC Type	Alias Point Code Type (See Notes 1 - 4)	Alias Point Code Type (See Notes 1 - 4)	DPC TYPE	Alias Point Code Type (See Notes 1 - 4)	Alias Point Code Type (See Notes 1 - 4)
	ANSI	no alias specified		ANSI	ITU-I Spare
	ANSI	ITU-I		ITU-I	no alias specified
	ANSI	ITU-I Spare		ITU-I Spare	no alias specified
	ITU-I	no alias specified			
	ITU-I (Note 5)	ITU-I Spare (Note 5)			
	ITU-I Spare	no alias specified			
	ITU-N	no alias specified			
	ITU-N	ITU-I			
	ITU-N	ITU-I Spare			

Notes:

1. ANSI alias point codes are specified with the `aliasa` parameter.
2. ITU-I and ITU-I Spare alias point codes are specified with the `aliasi` parameter.
3. ITU-N and ITU-N Spare alias point codes are specified with the `aliasn` parameter.
4. ITU-N24 alias point codes are specified with the `aliasn24` parameter.
5. To specify the ITU-I and ITU-I Spare alias point codes for the DPC, both point code values are specified with the `aliasi` parameter and the values are separated by a comma. For example, to specify the alias point codes 2-005-7 and s-3-002-1, the aliasi parameter is specified like this; `aliasi=2-005-7,s-3-002-1`. The `aliasa` and `aliasn` parameters cannot be specified for the DPC.
6. To specify the ITU-N and ITU-N Spare alias point codes for the DPC, both point code values are specified with the `aliasn` parameter and the values are separated by a comma. For example, to specify the alias point codes 00010 and s-00020, the aliasn parameter is specified like this; `aliasn=00010,s-00020`. The `aliasa` and `aliasi` parameters cannot be specified for the DPC.

Alias point codes can only be specified for full point code entries, and must be full point codes.

ANSI alias point codes cannot be a member of a cluster point code that is already in the database. A point code is a member of a cluster point code if it has the same network identifier (**NI**) and network cluster (**NC**) values as the cluster point code.

The EAGLE can contain the quantities of alias point codes shown in Table 2-16 depending the features that are enabled or turned on.

Table 2-16 Maximum Alias Point Code Quantities

Feature Status	Maximum Alias Point Code Quantity
The 5000 Routes feature is off and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
The 5000 Routes feature is on and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
6000 routesets are enabled	12000
7000 routesets are enabled	8000
8000 routesets are enabled	8000
10,000 routesets are enabled	10000

Destination point codes and alias point codes must be unique in the database. A point code can be defined as a true destination point code, an alias point code, the self ID of the EAGLE, or the capability point code of the EAGLE. The self IDs and capability point codes of the EAGLE can be verified with the `rtrv-sid` command.

If the `PCTYPE` field of the `rtrv-sid` command output contains the entry `ANSI`, and the network value of the destination point code specified by the `ent-dstn` command is from 0 to 5, the cluster value of that point code must be from 1 to 255. If the network value of that point code is from 6 to 255, the cluster value of that point code must be from 0 to 255.

The actual number of destination point codes that can be configured in the database is set by the `mtpdpcq` parameter of the `chg-stpopts` command, and is shown in the `MTPDPCQ` field in the `rtrv-stpopts` command output.

If the 5000 Routes feature is not on, and 6000, 7000, 8000, or 10,000 routesets are not enabled, a maximum of 2000 destination point codes can be configured in the database.

If the 5000 Routes feature is on, and 6000, 7000, 8000, or 10,000 routesets are not enabled, a maximum of 5000 destination point codes can be configured in the database.

If 6000 routesets are enabled, a maximum of 6000 destination point codes can be configured in the database.

If 7000 routesets are enabled, a maximum of 7000 destination point codes can be configured in the database.

If 8000 routesets are enabled, a maximum of 8000 destination point codes can be configured in the database.

If 10,000 routesets are enabled, a maximum of 10,000 destination point codes can be configured in the database.

Note:

For more information on the destination point code quantities, refer to the Changing the DPC Quantity procedure.

If ITU-N point codes are specified with the `ent-dstn` command, the format of the point code values must match the format shown in the `NPCFMTI` field of the `rtrv-stpopts` command output. For more information, refer to the 14-Bit ITU National Point Code Formats section.

Canceling the RTRV-DSTN Command

Because the `rtrv-dstn` command used in this procedure can output information for a long period of time, the `rtrv-dstn` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` command can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` command was entered
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` command was entered
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` command was entered, from another terminal other than the terminal where the `rtrv-dstn` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current destination point codes, using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   001-002-003    ls04clli    yes --- ----------      --------------    SS7
   030-045-*      rlghncbb010 yes yes ----------      --------------    SS7
   111-011-*      rlghncbb000 yes yes ----------      --------------    SS7
   240-012-004    rlghncbb001 yes ---    1-111-1         10-13-9-3-fr   SS7
   240-012-005    rlghncbb002 yes ---    1-112-2         10-13-10-0-ge  SS7
   240-012-006    rlghncbb003 yes ---    1-112-3         10-13-10-1-fr  SS7
   240-012-008    ----------- yes ---    1-113-5         10-13-10-2-ge  SS7

   DPCI           CLLI        BEI ELEI   ALIASA          ALIASN/N24     DMN
   2-131-1        rlghncbb023 no  ---    222-210-000     11-11-8-1-ge   SS7
   2-131-2        ----------- no  ---    222-211-001     11-11-8-2-fr   SS7
   2-131-3        ----------- no  ---    222-211-002     11-11-8-3-ge   SS7

   DPCN           CLLI        BEI ELEI   ALIASA          ALIASI         DMN
   10-15-2-3-fr   rlghncbb013 no  ---    222-200-200     2-121-1        SS7
   10-15-2-3-ge   rlghncbb013 no  ---    222-100-200     2-100-1        SS7
   10-15-3-0-fr   rlghncbb013 no  ---    222-200-201     2-121-2        SS7
   10-15-3-0-ge   rlghncbb013 no  ---    222-100-201     2-100-2        SS7

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   18
    EXCEPTION DPC(s):               0
```

```
    NETWORK DPC(s):              0
    CLUSTER DPC(s):              2
    TOTAL DPC(s):               20
    CAPACITY (% FULL):          1%
ALIASES ALLOCATED:            8000
    ALIASES USED:               22
    CAPACITY (% FULL):          1%
X-LIST ENTRIES ALLOCATED:      500
RTRV-DSTN: MASP A - COMPLTD
```

If a quantity of proxy point codes is enabled, the number of proxy point codes that are provisioned in the database are shown at the end of the `rtrv-dstn` output as shown in this example.

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                18
    EXCEPTION DPC(s):            0
    NETWORK DPC(s):              0
    CLUSTER DPC(s):              2
    Proxy DPC (s)                1
    TOTAL DPC(s):               20
    CAPACITY (% FULL):          1%
ALIASES ALLOCATED:            8000
    ALIASES USED:               22
    CAPACITY (% FULL):          1%
X-LIST ENTRIES ALLOCATED:      500
RTRV-DSTN: MASP A - COMPLTD
```

2. To add the new DPC, these entities must be checked depending on how the DPC will be provisioned.

   Perform the commands and procedures as required depending on how the DPC will be provisioned.

   The addition of the new DPC cannot exceed the current capacity shown in the `DESTINATION ENTRIES ALLOCATED` or the `Destination table` row of the `rtrv-dstn` output. If the current capacity will be exceeded by adding the new DPC, and the maximum capacity is shown in the `rtrv-dstn` output: 10,000 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` rows are not shown in the `rtrv-dstn` output, or 10,500 if the `DESTINATION ENTRIES ALLOCATED` and `X-LIST ENTRIES ALLOCATED` rows are shown in the `rtrv-dstn` output, perform Removing a Destination Point Code or Removing a Route Exception Entry to remove an existing DPC or exception route entry.

   If the maximum capacity is not shown in the `rtrv-dstn` output, perform Changing the DPC Quantity to increase the number of DPCs that can be in the database.

   The type of point code being added, ANSI, ITU-I, ITU-N, ITU-N24 must be shown in the `rtrv-dstn` output or the `rtrv-sid` output. If the point code type is not shown in the `rtrv-dstn` output, perform the `rtrv-sid` command in 3. If the point code type is not shown in `rtrv-dstn` and `rtrv-sid`, perform Adding a Point Code to the Self-Identification of the EAGLE to add a point code of the desired point code type.

If the new DPC will be a 14-bit ITU-N point code, and a group code will be assigned to the point code, the group code must be defined in `rtrv-sid` output in 3, `rtrv-dstn` output in 1, or `rtrv-spc` output in 4. If the group code is not shown in either of these outputs, perform Adding a Point Code to the Self-Identification of the EAGLEto add an entry with the desired group code. If the group code will be different from the ones shown in the `rtrv-sid` or `rtrv-dstn` outputs, perform Adding a Secondary Point Code to add a secondary point code with the desired group code.

If a secondary point code will be specified with the DPC, the secondary point code must be shown in the `rtrv-spc` output in 4. It the secondary point code is not shown in the `rtrv-spc` output, performAdding a Secondary Point Code to add the desired secondary point code.

If the `clli` parameter will be specified with the DPC, the `clli` parameter value cannot be shown in the `rtrv-sid` or `rtrv-dstn` outputs. Enter the `rtrv-sid` command in 3 to verify the `CLLI` value in the self-identification of the EAGLE.

The format of a 14-bit ITU-N DPC must match the format defined by the `NPCFMTI` value in the `rtrv-stpopts` output. Enter the `rtrv-stpopts` in 5 to verify the `NPCFMTI` value. If you wish to change the format, perform 14-Bit ITU National Point Code Formats.

To specify an alias point code with the DPC, adding the new alias point code cannot exceed the maximum alias point code quantity shown in the `ALIASES ALLOCATED:` or the `Alias table` row in the `rtrv-dstn` output. If the maximum alias point code quantity will be exceeded, perform Changing a Destination Point Code to remove enough alias point codes to allow the new alias point code to be added.

If the `nprst` or `rcause` parameters will be specified with the DPC, the TIF Number Portability feature must be enabled. Enter the `rtrv-ctrl-feat` command in 6 to verify that the feature is enabled. If the feature is not enabled, perform the procedures in *TIF User's Guide* to enable the TIF Number Portability feature.

If the `splitiam` parameter will be specified with the DPC, at least one of these features must be enabled.

- TIF Number Portability
- TIF SCS Forwarding
- TIF Simple Number Substitution
- TIF Additional Subscriber Data
- TIF Generic Routing Number
  Enter the `rtrv-ctrl-feat` command in 6 to verify if any of these features are enabled.

  If none of these features are enabled, perform the procedures in *TIF User's Guide* to enable one of more of these features.

If the `prx=yes` or `ppc` parameters will be specified with the DPC, the Proxy Point Code feature must be enabled. The addition of the proxy point code with the `prx=yes` parameter cannot exceed the enabled proxy point code quantity, shown in the `PPC table` or `PROXY DPC(s):` row of the `rtrv-dstn` output. Enter the `rtrv-ctrl-feat` command in 6 to verify if a proxy point code quantity is enabled. If a proxy point code quantity is enabled, the Proxy Point Code feature is enabled. To enable the Proxy Point Code feature or increase the proxy point code quantity, perform Changing the Proxy Point Code Quantity. If the enabled quantity is 100, and 100 proxy point codes are in the database, no more proxy point codes can be added.

The `ppc` parameter assigns an existing proxy point code to the DPC. Enter the `rtrv-dstn:prx=yes` command in 7 to verify that the proxy point code is in the database.

The `sccpmsgcnv` parameter specifies the kind of conversion performed on messages for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. Enter the `rtrv-ctrl-feat` command in 6 to verify that the XUDT UDT Conversion feature is enabled and turned on. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

After the required entities have been verified and provisioned, continue the procedure with 8.

3. Display the self-identification of the EAGLE using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT  EAGLE5 36.0.0
   PCA              PCI          PCN
CLLI               PCTYPE
   100-100-100      3-75-7       7-9-8-1-fr
rlghncxa03w        OTHER

   CPCA
   002-002-002       002-002-003       002-002-004      002-002-005
   002-002-006       002-002-007       002-002-008      002-002-009
   004-002-001       004-003-003       050-060-070

   CPCA (LNP)
   005-005-002       005-005-004       005-005-005

   CPCI
   1-002-1           1-002-2           1-002-3          1-002-4
   2-001-1           7-222-7

   CPCN
   2-0-10-3-fr       2-0-11-0-fr       2-0-11-2-fr      2-0-12-1-fr
   2-2-3-3-fr        2-2-4-0-fr        10-14-10-1-fr
```

4. Display the secondary point codes in the database with the `rtrv-spc` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
SPC (Secondary Point Codes)
SPCA
     001-010-010
     002-010-010
     003-010-010
     010-100-010
SPC-I
         1-253-5
```

```
         2-254-6
         3-255-7
         4-100-1
SPC-N
        10-1-11-1-ge
        13-2-12-0-ge
        14-15-12-1-ge
SPC-N24
none
Secondary Point Code table is (11 of 40) 28% full
```

5. Display the existing values for the `npcfmti` parameter by entering the `rtrv-stpopts` command.

   The value for the `npcfmti` parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The`rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-stpopts` command, see the`rtrv-stpopts` command description in *Commands User's Guide*.

6. Display the features that are enabled by entering the `rtrv-ctrl-feat` command..

   The following is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.
```

```
The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

7. Display the proxy point codes in the database by entering this command.

   `rtrv-dstn:prx=yes`

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0

PRX = yes

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   002-002-002   ----------- no   --- ----------
--------------   SS7

Destination table is (18 of 2000) 1% full
Alias table is (22 of 8000) 1% full
PPC table is (1 of 10) 10% full
```

   If the desired proxy point code is shown in the `rtrv-dstn` output, perform 8.c of 8 to assign the proxy point code to the destination point code with the `ppc` parameter.

   If the desired proxy point code is not shown in the `rtrv-dstn` output, add the proxy point code by performing 8.b of 8 with the `prx=yes` parameter. After the new proxy point code has been added, perform 8.c of 8 again to assign the proxy point code to the destination point code with the ppc parameter.

8. Add the destination point code, using the `ent-dstn` command.

   - If proxy point codes are not being provisioned in this procedure, perform 8.a.
   - If a new proxy point code is being provisioned with the `prx=yes` parameter, perform 8.b.
   - If a proxy point code is being assigned to a destination point code, perform 8.c.

   a. Add the destination point code to the database without specifying the `prx` or `ppc` parameters. If alias point codes will be assigned to the DPC, Table 2-15 shows the DPC and alias point type combinations that can be used with the `ent-dstn` command.

      ```
      ent-
      dstn:dpca=240-012-007:bei=yes:aliasi=1-117-3:aliasn=10-13
      -11-1-
      fr :spca=001-010-010:homescp=yes:homesmsc=yes:sccpmsgcnv=
      xudt2udt
      ```

      `ent-dstn:dpca=240-012-006:spca=002-010-010`

```
ent-
dstn:dpci=4-163-5:bei=no:aliasa=250-200-007:domain=ss7:spci=2-
254-6
```

```
ent-dstn:dpcn=7-9-10-1-
fr:bei=no:aliasa=210-090-100 :aliasi=1-75-6:domain=ss7
```

```
ent-dstn:dpcn=7-9-10-1-
ge:bei=no:aliasa=210-100-100:aliasi=2-175-6 :domain=ss7:spcn=1
3-02-12-0-ge
```

```
ent-dstn:dpci=3-002-1:aliasn=9-12-2-1-fr,s-8-11-3-0-ge
```

```
ent-dstn:dpcn=10-11-1-3-fr:aliasi=3-125-0,s-4-135-3
```

```
ent-dstn:dpcn=6-10-7-9-
ge:bei=no:aliasa=211-100-100:aliasi=3-175-6 :spcn=13-02-12-1-
ge:rcause=15:nprst=on:splitiam=20
```

b. To add a new proxy point code to the database, specify the `ent-dstn` command with the `prx=yes` parameter.

   For this example, enter this command.

   ```
   ent-dstn:dpca=003-003-003:prx=yes
   ```

   > **Note:**
   >
   > The point code being added as a proxy point code must be a full point code, in the SS7 domain, and cannot be a private point code. The point code cannot have the `ipgwapc=yes` parameter value assigned.

c. To assign a proxy point code to a destination point code, specify the `ent-dstn` command with the `ppc` parameter.

   For this example, enter this command.

   ```
   ent-dstn:dpca=004-004-004:ppca=003-003-003
   ```

   The following rules apply to assigning proxy point codes to destination point codes.

   - The destination point code must be a full point code and cannot be a private point code.
   - The destination point code cannot have the `ipgwapc=yes` parameter value assigned.
   - The destination point code and proxy point code must be the same network type. For example, if the destination point code is an ANSI point code, the proxy point code must be an ANSI point code.
   - If the destination point code and proxy point code are 14-bit ITU-N point codes with a group code, the group code values for both the destination point code and the proxy point code must be the same.

When the `ent-dstn` command has successfully completed, and the Cluster Routing and Management Diversity feature is turned off (shown with the `CRMD = off` entry in the rtrv-feat command output), and no proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
Destination table is (27 of 2000) 1% full
Alias table is (27 of 12000) 1% full
ENT-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (CRMD = on in the rtrv-feat command output), and no proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   27
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  29
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  31
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
ENT-DSTN: MASP A - COMPLTD
```

If a proxy point code quantity is enabled and the Cluster Routing and Management Diversity feature is turned off (shown with the CRMD = off entry in the rtrv-feat command output), this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
Destination table is (29 of 2000) 1% full
Alias table is (27 of 12000) 1% full
PPC table is (2 of 10) 20% full
ENT-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (CRMD = on in the rtrv-feat command output), and a proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  29
```

```
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:              8000
    ALIASES USED:                 27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:        500
ENT-DSTN: MASP A - COMPLTD
```

9. Verify the changes using the `rtrv-dstn` command with the DPC that was entered in 8.

   For this example, enter these commands.

   `rtrv-dstn:dpca=240-012-007`
   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI           ALIASN/N24    DMN
   240-012-007    ----------- yes ---    1-117-3          10-13-11-1-fr SS7

   SPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   001-010-010   ---- no      none   off   none     yes    yes   xudt2udt

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  29
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:              8000
    ALIASES USED:                 27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:        500
RTRV-DSTN: MASP A - COMPLTD
```

   `rtrv-dstn:dpca=240-012-006`
   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI           ALIASN/N24    DMN
   240-012-006    rlghncbb003 yes ---    1-112-3          10-13-10-1-fr SS7

   SPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   002-010-010   ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
```

```
    TOTAL DPC(s):                 29
    CAPACITY (% FULL):            1%
ALIASES ALLOCATED:              8000
    ALIASES USED:                 27
    CAPACITY (% FULL):            1%
X-LIST ENTRIES ALLOCATED:        500
RTRV-DSTN: MASP A - COMPLTD
```

`rtrv-dstn:dpci=4-163-5`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCI          CLLI        BEI ELEI   ALIASA
ALIASN/N24    DMN
   4-163-5       ----------- no  ---    250-200-007
--------------   SS7

   SPCI         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   2-154-6      ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                  25
    EXCEPTION DPC(s):              0
    NETWORK DPC(s):                0
    CLUSTER DPC(s):                2
    Proxy DPC(s):                  2
    TOTAL DPC(s):                 29
    CAPACITY (% FULL):            1%
ALIASES ALLOCATED:              8000
    ALIASES USED:                 27
    CAPACITY (% FULL):            1%
X-LIST ENTRIES ALLOCATED:        500
RTRV-DSTN: MASP A - COMPLTD
```

`rtrv-dstn:dpcn=7-9-10-1-fr`
This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN          CLLI        BEI ELEI   ALIASA
ALIASI        DMN
   7-9-10-1-fr   ----------- no  ---    210-090-100
1-75-6        SS7

   SPCN         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
```

```
    FULL DPC(s):                 25
    EXCEPTION DPC(s):             0
    NETWORK DPC(s):               0
    CLUSTER DPC(s):               2
    Proxy DPC(s):                 2
    TOTAL DPC(s):                29
    CAPACITY (% FULL):           1%
ALIASES ALLOCATED:             8000
    ALIASES USED:                27
    CAPACITY (% FULL):           1%
X-LIST ENTRIES ALLOCATED:       500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpcn=7-9-10-1-ge
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN          CLLI        BEI ELEI   ALIASA          ALIASI        DMN
   7-9-10-1-ge   ----------- no  ---    210-100-100     2-175-6       SS7

   SPCN          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   13-02-12-0-ge ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                 25
    EXCEPTION DPC(s):             0
    NETWORK DPC(s):               0
    CLUSTER DPC(s):               2
    Proxy DPC(s):                 2
    TOTAL DPC(s):                29
    CAPACITY (% FULL):           1%
ALIASES ALLOCATED:             8000
    ALIASES USED:                27
    CAPACITY (% FULL):           1%
X-LIST ENTRIES ALLOCATED:       500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpca=003-003-003
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   003-003-003   ----------- no  --- ----------      --------------   SS7

   SPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  ---- yes, 1  none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
```

```
    FULL DPC(s):                 25
    EXCEPTION DPC(s):             0
    NETWORK DPC(s):               0
    CLUSTER DPC(s):               2
    Proxy DPC(s):                 2
    TOTAL DPC(s):                29
    CAPACITY (% FULL):           1%
ALIASES ALLOCATED:             8000
    ALIASES USED:                27
    CAPACITY (% FULL):           1%
X-LIST ENTRIES ALLOCATED:       500
RTRV-DSTN: MASP A - COMPLTD
```

`rtrv-dstn:dpca=004-004-004`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   004-004-004   ----------- no  --- ----------
--------------   SS7

   PPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   003-003-003  ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                 25
    EXCEPTION DPC(s):             0
    NETWORK DPC(s):               0
    CLUSTER DPC(s):               2
    Proxy DPC(s):                 2
    TOTAL DPC(s):                29
    CAPACITY (% FULL):           1%
ALIASES ALLOCATED:             8000
    ALIASES USED:                27
    CAPACITY (% FULL):           1%
X-LIST ENTRIES ALLOCATED:       500
RTRV-DSTN: MASP A - COMPLTD
```

`rtrv-dstn:dpci=3-002-1`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCI          CLLI        BEI ELEI    ALIASN
ALIASN       DMN
   3-002-1       ----------- no  ---     9-12-2-1-fr   s-8-11-3-0-
ge   SS7
```

```
   SPCI         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  29
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpcn=10-11-1-3-fr
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN          CLLI        BEI ELEI    ALIASI          ALIASI       DMN
   10-11-1-3-fr  ----------- no  ---     3-125-0        s-4-135-3     SS7

   SPCN         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  ---- no      none   off   none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  29
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpcn=6-10-7-9-ge
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN          CLLI        BEI ELEI   ALIASA           ALIASI        DMN
   6-10-7-9-ge   ----------- no  ---    211-100-100      3-175-6       SS7
```

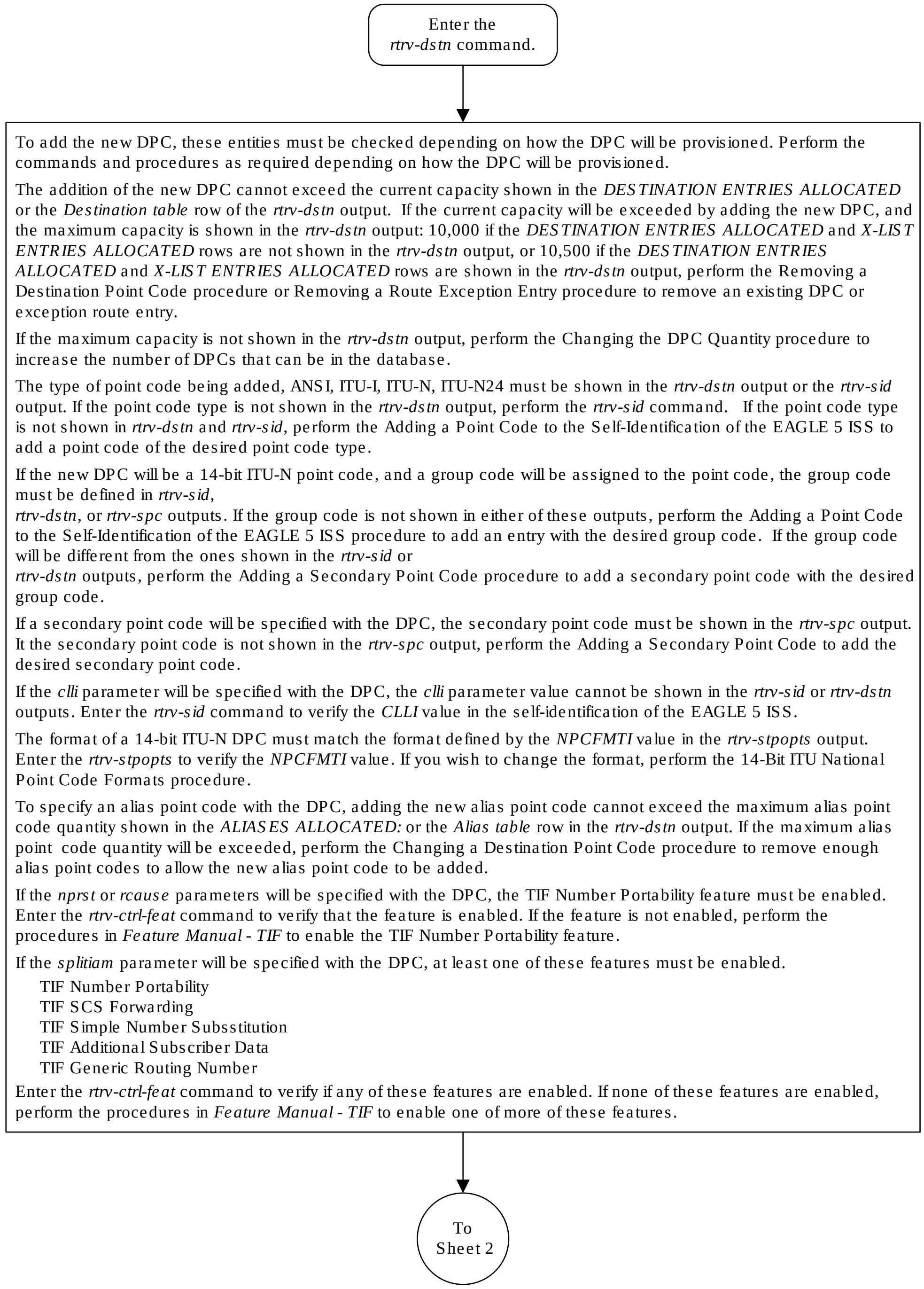
```
   SPCN          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   13-02-12-1-ge ---- no      15     on    20       no     no
none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   25
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  29
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

10. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

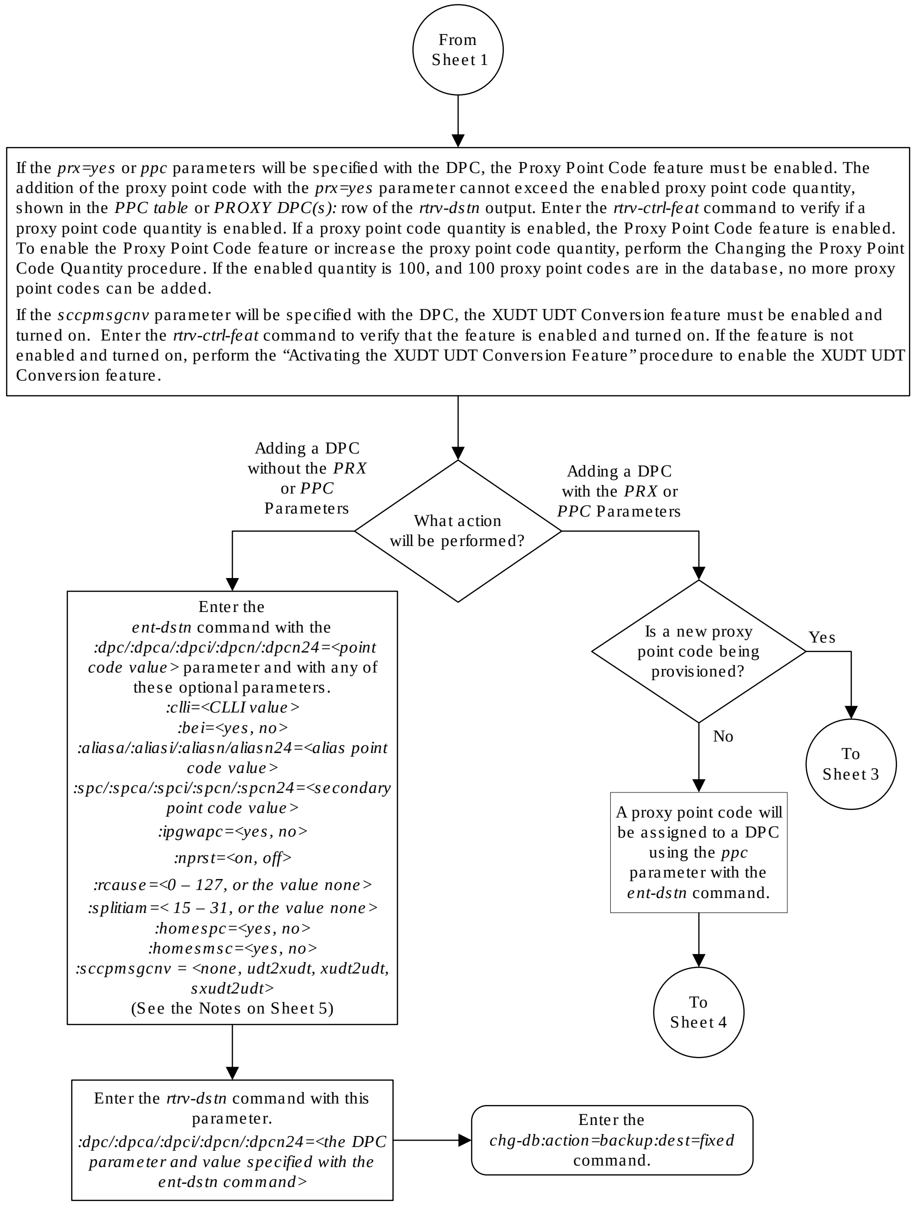
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

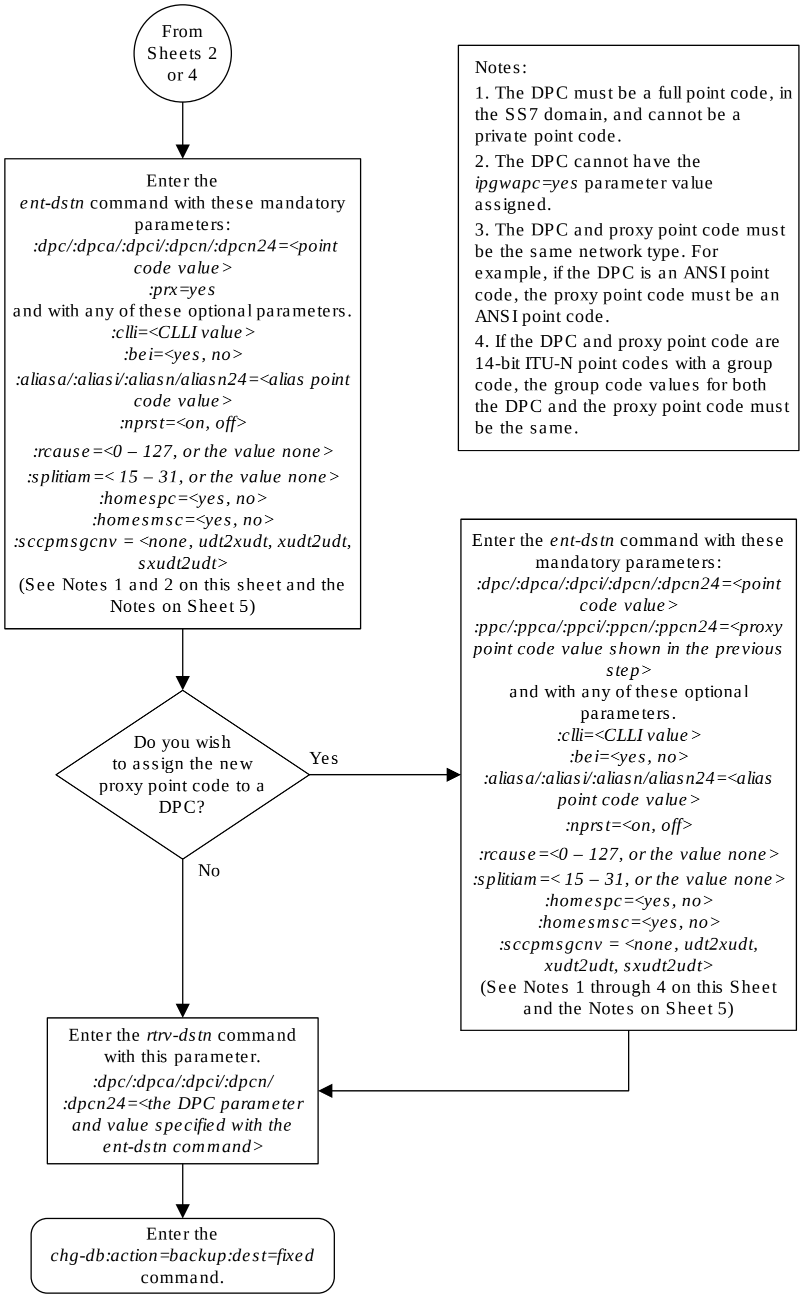
Figure 2-30 Adding a Destination Point Code



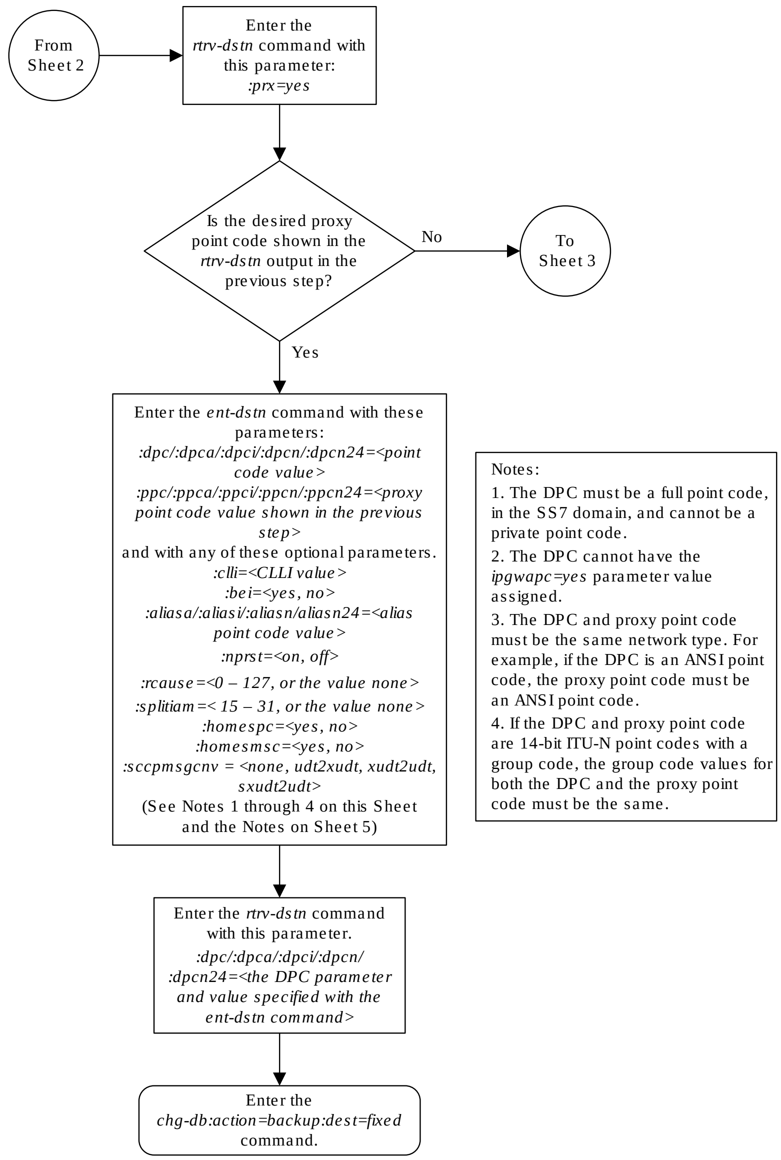
Sheet 1 of 5


From Sheet 1
If the prx=yes or ppc parameters will be specified with the DPC, the Proxy Point Code feature must be enabled. The addition of the proxy point code with the prx=yes parameter cannot exceed the enabled proxy point code quantity, shown in the PPC table or PROXY DPC(s): row of the rtrv-dstn output. Enter the rtrv-ctrl-feat command to verify if a proxy point code quantity is enabled. If a proxy point code quantity is enabled, the Proxy Point Code feature is enabled. To enable the Proxy Point Code feature or increase the proxy point code quantity, perform the Changing the Proxy Point Code Quantity procedure. If the enabled quantity is 100, and 100 proxy point codes are in the database, no more proxy point codes can be added.
If the sccpmsgcnv parameter will be specified with the DPC, the XUDT UDT Conversion feature must be enabled and turned on. Enter the rtrv-ctrl-feat command to verify that the feature is enabled and turned on. If the feature is not enabled and turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure to enable the XUDT UDT Conversion feature.
What action will be performed?
Adding a DPC without the PRX or PPC Parameters
Adding a DPC with the PRX or PPC Parameters
Enter the ent-dstn command with the :dpc/:dpca/:dpci/:dpcn/:dpcn24=<point code value> parameter and with any of these optional parameters.
:clli=<CLLI value>
:bei=<yes, no>
:aliasa/:aliasi/:aliasn/aliasn24=<alias point code value>
:spc/:spca/:spci/:spcn/:spcn24=<secondary point code value>
:ipgwapc=<yes, no>
:nprst=<on, off>
:rcause=<0 – 127, or the value none>
:splitiam=< 15 – 31, or the value none>
:homespc=<yes, no>
:homesmsc=<yes, no>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
(See the Notes on Sheet 5)
Is a new proxy point code being provisioned?
Yes
No
To Sheet 3
A proxy point code will be assigned to a DPC using the ppc parameter with the ent-dstn command.
To Sheet 4
Enter the rtrv-dstn command with this parameter.
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<the DPC parameter and value specified with the ent-dstn command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 2 of 5


From Sheets 2 or 4
Notes:
1. The DPC must be a full point code, in the SS7 domain, and cannot be a private point code.
2. The DPC cannot have the *ipgwapc=yes* parameter value assigned.
3. The DPC and proxy point code must be the same network type. For example, if the DPC is an ANSI point code, the proxy point code must be an ANSI point code.
4. If the DPC and proxy point code are 14-bit ITU-N point codes with a group code, the group code values for both the DPC and the proxy point code must be the same.
Enter the *ent-dstn* command with these mandatory parameters:
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<point code value>
:prx=yes
and with any of these optional parameters.
:clli=<CLLI value>
:bei=<yes, no>
:aliasa/:aliasi/:aliasn/aliasn24=<alias point code value>
:nprst=<on, off>
:rcause=<0 – 127, or the value none>
:splitiam=< 15 – 31, or the value none>
:homespc=<yes, no>
:homesmsc=<yes, no>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
(See Notes 1 and 2 on this sheet and the Notes on Sheet 5)
Do you wish to assign the new proxy point code to a DPC?
Yes
No
Enter the *ent-dstn* command with these mandatory parameters:
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<point code value>
:ppc/:ppca/:ppci/:ppcn/:ppcn24=<proxy point code value shown in the previous step>
and with any of these optional parameters.
:clli=<CLLI value>
:bei=<yes, no>
:aliasa/:aliasi/:aliasn/aliasn24=<alias point code value>
:nprst=<on, off>
:rcause=<0 – 127, or the value none>
:splitiam=< 15 – 31, or the value none>
:homespc=<yes, no>
:homesmsc=<yes, no>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
(See Notes 1 through 4 on this Sheet and the Notes on Sheet 5)
Enter the *rtrv-dstn* command with this parameter.
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<the DPC parameter and value specified with the ent-dstn command>
Enter the *chg-db:action=backup:dest=fixed* command.

Sheet 3 of 5


From Sheet 2
Enter the *rtrv-dstn* command with this parameter: *:prx=yes*
Is the desired proxy point code shown in the *rtrv-dstn* output in the previous step?
No
To Sheet 3
Yes
Enter the *ent-dstn* command with these parameters:
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<point code value>
:ppc/:ppca/:ppci/:ppcn/:ppcn24=<proxy point code value shown in the previous step>
and with any of these optional parameters.
:clli=<CLLI value>
:bei=<yes, no>
:aliasa/:aliasi/:aliasn/aliasn24=<alias point code value>
:nprst=<on, off>
:rcause=<0 – 127, or the value none>
:splitiam=< 15 – 31, or the value none>
:homespc=<yes, no>
:homesmsc=<yes, no>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
(See Notes 1 through 4 on this Sheet and the Notes on Sheet 5)
Enter the *rtrv-dstn* command with this parameter.
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<the DPC parameter and value specified with the ent-dstn command>
Enter the *chg-db:action=backup:dest=fixed* command.
Notes:
1. The DPC must be a full point code, in the SS7 domain, and cannot be a private point code.
2. The DPC cannot have the *ipgwapc=yes* parameter value assigned.
3. The DPC and proxy point code must be the same network type. For example, if the DPC is an ANSI point code, the proxy point code must be an ANSI point code.
4. If the DPC and proxy point code are 14-bit ITU-N point codes with a group code, the group code values for both the DPC and the proxy point code must be the same.

Sheet 4 of 5

Notes:
1. The *PCI* and *PCN* columns of the *rtrv-sid* output can contain spare and non-spare point code values. To provision ITU-I or 14-bit ITU-N non-spare point codes in this procedure, the *rtrv-sid* output must contain non-spare point codes (ITU-I non-spare point code in the *PCI* column and 14-bit ITU-N non-spare point code in the *PCN* column). To provision ITU-I or 14-bit ITU-N spare point codes in this procedure, the *rtrv-sid* output must contain spare point codes (ITU-I spare point code in the *PCI* column and 14-bit ITU-N spare point code in the *PCN* column).
2. The *:dpc/:dpca/:dpci/:dpcn/:dpcn24, :aliasa/:aliasi/:aliasn/:aliasn24, :spc/:spca/:spci/:spcn/:spcn24 and :ppc/:ppca/:ppci/:ppcn/:ppcn24* parameters are used to provision either ANSI, ITU-I, 14-bit ITU-N, or 24-bit ITU-N point codes.
:dpc/:dpca, :spc/:spca, :aliasa, :ppc/ppca = ANSI DPC, private ANSI DPC, SPC, alias point code, proxy point code
:dpci, :spci, :aliasi, :ppci = ITU-I DPC (non-spare point code, spare point code, private point code, private spare point code), SPC (non-spare or spare point code), alias point code (non-spare or spare point code), proxy point code
:dpcn, :spcn, :aliasn, :ppcn = 14-bit ITU-N DPC (non-spare point code, spare point code, private point code, private spare point code), SPC (non-spare or spare point code), alias point code (non-spare or spare point code), proxy point code
:dpcn24, :spcn24, :aliasn24, :ppcn24 = 24-bit ITU-N DPC, private 24-bit ITU-N DPC, SPC, alias point code, proxy point code
3. The network type of alias point codes cannot be the same as the network type of the DPC.
If the DPC is ANSI, then either ITU-I or ITU-N (14-bit or 24-bit) alias point codes can be assigned.
If the DPC is ITU-I, then either ANSI or ITU-N (14-bit or 24-bit) alias point codes can be assigned.
If the DPC is either a 14-bit or a 24-bit ITU-N, then either ITU-I or ANSI alias point codes can be assigned.
4. The system can contain 14-bit ITU-N point codes or 24-bit ITU-N point codes, but not both at the same time.
5. The network type of an SPC must be the same as the network type of the DPC.
6. The alias point code and SPC value must be full point codes.
7. The alias point code value cannot be shown in the *rtrv-dstn* output.
8. The NI and NC values of an ANSI point code cannot be the same as the NI and NC values of any cluster point code shown in the *rtrv-dstn* output.
9. The *rtrv-sid* output must show values in the *PCA, PCI, PCN*, or *PCN24* fields before a DPC of the network type corresponding to these fields can be added.
10. The DPC or CLLI value being added cannot be shown in the *rtrv-sid* output.
11. The DPC being added cannot be an alias point code.
12. The SPC value must be show in the *rtrv-spc* output.
13. If a 14-bit ITU-N DPC is being added and the ITU Duplicate Point Code feature is on, and no SPC are being assigned the DPC, the group code assigned to the DPC must be the same as the group code value shown in the *PCN* field of the *rtrv-sid* output.
14. If a 14-bit ITU-N DPC is being added and the ITU Duplicate Point Code feature is on, and an SPC is being assigned the DPC, the group code assigned to the DPC must be the same as the group code assigned to the SPC.
15. The format of 14-bit ITU-N point codes must match the format defined by the *NPCFMTI* value of the *rtrv-stpopts* output.
16. The *ipgwapc* parameter can be used only for ANSI DPCs that will be used to define the IP gateway APC of a linkset.
17. The default value for the *domain* parameter is *ss7*, and the default value for the *bei* parameter is *no*.
18. The EAGLE 5 ISS can contain these quantities of alias point codes depending the features that are enabled or turned on.
5000 routes is not turned on, 6000, 7000, 8000, or 10,000 routesets is not enabled – 12,000 alias point codes
5000 routes is turned on, 6000, 7000, 8000, or 10,000 routesets is not enabled – 12,000 alias point codes
6000 routesets are enabled – 12,000 alias point codes
7000 routesets are enabled – 8000 alias point codes
8000 routeset are enabled – 8000 alias point codes
10,000 routesets are enabled – 10,000 alias point codes
The number of alias point codes is shown in the *ent-dstn* and *rtrv-dstn* outputs.
19. The type of alias point code that can provisioned is dependent on the type of DPC that is being provisioned. Refer to the Destination Point Code and Alias Point Code Type Combinations table in the "Adding a Destination Point Code" procedure located in the *Database Administration Manual – SS7* for the alias point code parameter combinations.
20. The default value for the *sccpmsgcnv* parameter is *none*.

Sheet 5 of 5

2.22 Removing a Destination Point Code

This procedure is used to remove a destination point code from the database, using the `dlt-dstn` command.

The `dlt-dstn` command uses this parameter:

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code being removed from the database

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for ITU national point codes.

The destination point code to be removed must exist in the database, but cannot be assigned to any routes. Enter the `rtrv-rte` command to see if the destination point code to be removed is assigned to any routes. If the destination point code is assigned to any routes, perform Removing a Route to remove these routes.

The destination point code cannot be defined as an adjacent point code for a linkset. Enter the `rtrv-ls` to see if the destination point code to be removed is defined as an adjacent point code for a linkset. If the destination point code is defined as an adjacent point code for a linkset, perform Removing a Linkset Containing SS7 Signaling Links.

The destination point code cannot be removed if all of these conditions are present:

- The destination point code is a member of a cluster point code. This is shown by entering the `rtrv-dstn` command and specifying the destination point code with three asterisks (***) for the network cluster member value of the destination point code instead of the actual network cluster value of the destination point code.
- The `NCAI` value of the cluster point code is `no`. This is shown by entering the `rtrv-dstn` command and specifying the cluster point code.
- The destination point code is the DPC of an exception route. This is shown by entering the `rtrv-rtx` command and specifying the destination point code that is being removed.

If the destination point code meets these conditions, perform the Removing a Route Exception Entry procedure to remove the exception route entries that reference the DPC that is being removed.

The destination point code cannot be in the mated relay node (**MRN**) table. Verify this by entering the `rtrv-mrn` command, specifying the destination point code being removed from the database. If the destination point code is shown in the `rtrv-mrn` command output, remove the point code from the MRN table, by performing the Removing an MRN Group or MRN Group Entry" procedure in *Database Administration - GTT User's Guide*.

The destination point code cannot be in the mated application (**MAP**) table. Verify this by entering the `rtrv-map` command, specifying the destination point code being removed from the database. If the destination point code is shown in the `rtrv-map` command output, remove the point code from the MAP table, by performing the Removing a Mated Application" procedure in *Database Administration - GTT User's Guide*.

The destination point code cannot be defined as an end office internal point code. Verify this by entering the `rtrv-rmt-appl` command. If the destination point code is shown in the `rtrv-rmt-appl` command output, perform the “Removing an End Node Internal **Point Code**” procedure in *Database Administration - IP7 User's Guide* to remove the internal point code.

If the point code being removed in this procedure is a proxy point code, the proxy point code cannot be removed if the proxy point code is assigned to a destination point code or assigned to a linkset. Proxy point codes are shown in the `rtrv-dstn:dpc=<DPC value>` output with the entry `PRX=yes`. To verify if the proxy point code is assigned to a destination point code, enter the `rtrv-dstn` command with the `ppc` parameter equal to the proxy point code value. This will display all the destination point codes that reference the proxy point code. These destination point codes must be removed before the proxy point code can be removed.

To verify if the proxy point code is assigned to a linkset, enter the `rtrv-ls` command with the `ppc` parameter equal to the proxy point code value. This will display all the linksets that reference the proxy point code. These linksets must be removed before the proxy point code can be removed.

Canceling the RTRV-DSTN and RTRV-LS Commands

Because the `rtrv-dstn` and `rtrv-ls` commands used in this procedure can output information for a long period of time, the `rtrv-dstn` and `rtrv-ls` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` and `rtrv-ls` commands can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` or `rtrv-ls` command was entered
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` or `rtrv-ls` command was entered
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` or `rtrv-ls` command was entered, from another terminal other than the terminal where the `rtrv-dstn` or `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current destination point codes, using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   000-005-000   ----------- yes --- ----------      --------------   SS7
   000-007-000   ----------- yes --- ----------      --------------   SS7
   001-001-001   ----------- yes --- ----------      --------------   SS7
   001-001-002   ----------- yes --- ----------      --------------   SS7
   001-207-000   ----------- yes --- ----------      --------------   SS7
   002-002-002   ----------- yes --- ----------      --------------   SS7
   002-004-100   ----------- yes --- ----------      --------------   SS7
   003-003-003   ----------- yes --- ----------      --------------   SS7
   004-004-004   ----------- yes --- ----------      --------------   SS7
   007-*-*       ----------- yes --- ----------      --------------   SS7
   007-007-007   ----------- yes --- ----------      --------------   SS7
   008-001-001   ----------- yes --- ----------      --------------   SS7
```

```
   008-001-003   ----------- yes --- ----------
--------------   SS7
   008-001-004   ----------- yes --- ----------
--------------   SS7
   008-001-005   ----------- yes --- ----------
--------------   SS7
   008-001-006   ----------- yes --- ----------
--------------   SS7
   008-001-007   ----------- yes --- ----------
--------------   SS7
   008-001-008   ----------- yes --- ----------
--------------   SS7
   030-045-*     rlghncbb010 yes yes ----------
--------------   SS7
   111-011-*     rlghncbb000 yes yes ----------
--------------   SS7
   240-012-*     rlghncbb000 yes yes ----------
--------------   SS7
   240-012-004   rlghncbb001 yes ---    1-111-1         10-13-9-3-
fr  SS7
   240-012-005   rlghncbb002 yes ---    1-112-2         10-13-10-0-
ge SS7
   240-012-006   rlghncbb003 yes ---    1-112-3         10-13-10-1-
fr SS7
   240-012-007   ----------- yes ---    1-117-3         10-13-11-1-
fr SS7
   240-012-008   ----------- yes ---    1-113-5         10-13-10-2-
ge SS7

   DPCI          CLLI        BEI ELEI   ALIASA
ALIASN/N24     DMN
   0-015-0       ----------- no  --- --------------
--------------  SS7
   0-017-0       ----------- no  --- --------------
--------------  SS7
   1-011-1       ----------- no  --- --------------
--------------  SS7
   1-011-2       ----------- no  --- --------------
--------------  SS7
   1-207-0       ----------- no  --- --------------
--------------  SS7
   2-131-1       rlghncbb023 no  ---    222-210-000     11-11-8-1-
ge  SS7
   2-131-2       ----------- no  ---    222-211-001     11-11-8-2-
fr  SS7
   2-131-3       ----------- no  ---    222-211-002     11-11-8-3-
ge  SS7
   3-003-3       ----------- no  --- --------------
--------------  SS7
   4-163-5       ----------- no  ---    250-200-007
--------------   SS7

   DPCN          CLLI        BEI ELEI   ALIASA
ALIASI         DMN
   7-9-10-1-fr   ----------- no  ---    210-090-100
```

```
1-75-6        SS7
   7-9-10-1-ge   ----------- no  ---    210-100-100     2-175-6       SS7
   10-12-0-0-fr  ----------- no  --- --------------   --------------  SS7
   10-15-2-3-fr  rlghncbb013 no  ---    222-200-200     2-121-1       SS7
   10-15-2-3-ge  rlghncbb013 no  ---    222-100-200     2-100-1       SS7
   10-15-3-0-fr  rlghncbb013 no  ---    222-200-201     2-121-2       SS7
   10-15-3-0-ge  rlghncbb013 no  ---    222-100-201     2-100-2       SS7

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   38
    EXCEPTION DPC(s):               3
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  45
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If a quantity of proxy point codes is enabled, the number of proxy point codes that are provisioned in the database are shown at the end of the `rtrv-dstn` output as shown in this example.

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   38
    EXCEPTION DPC(s):               3
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 3
    Proxy DPC (s)                   2
    TOTAL DPC(s):                  47
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

2. Verify whether or not the **DPC** to be removed from the database is a DPC of a route, by entering the `rtrv-rte` command with the DPC that is to be removed from the database. For this example, enter these commands.

   `rtrv-rte:dpca=240-012-007`

   This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0

   DPCA           ALIASI      ALIASN/N24    LSN         RC     APCA
   240-012-007    1-117-3     10-13-11-1-fr ls04        10     240-012-007
                                            ls02        20     004-004-004
```

```
                                            ls03       30
003-003-003
                                               RTX:No  CLLI=ls04clli


rtrv-rte:dpca=002-002-002


rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
   DPCA           ALIASI      ALIASN/N24    LSN        RC    APCA
   002-002-002 ----------- --------------   ls20       10
002-002-002
                                               RTX:No
CLLI=-----------
```

If the DPC being removed from the database is a DPC of a route, perform the Removing a Route procedure to remove the route from the database.

3. Verify whether or not the DPC to be removed from the database is an **APC** of a linkset, by entering the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2          001-207-000    none 1   1   no  B   6    off off off
no    off
ls1305        000-005-000    none 1   1   no  A   1    off off off
no    off
ls1307        000-007-000    none 1   1   no  A   1    off off off
no    off
e1m1s1        001-001-001    none 1   1   no  A   7    off off off
no    off
e1m1s2        001-001-002    none 1   1   no  A   7    off off off
no    off
ls01          002-004-100    none 1   1   no  A   1    off off off
no    off
ls20          002-002-002    none 1   1   no  PRX 1    off off off
no    off

                                 L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i         1-207-0        none 1   1   no  B   4    off off off
---   on
ls1315        0-015-0        none 1   1   no  A   1    off off off
---   off
ls1317        0-017-0        none 1   1   no  A   1    off off off
---   on
e1m2s1        1-011-1        none 1   1   no  A   7    off off off
---   off
e1m2s2        1-011-2        none 1   1   no  A   7    off off off
```

```
---   off

Link set table is (11 of 1024) 1% full.
```

Perform the Removing a Linkset Containing SS7 Signaling Links procedure to remove the linkset from the database.

4. Verify that the **GTT** feature is on, by entering the `rtrv-feat` command. If the GTT feature is on, the `GTT` field should be set to `on`.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the GTT feature is off, continue the procedure with 8.

If the GTT feature is on, continue the procedure with 5.

5. Display the mated applications in the database, using the `rtrv-map` command and the DPC being removed from the database. For this example, enter these commands.

`rtrv-map:pca=244-012-007`

This is an example of the possible output.

```
rlghncxa03w 10-07-25 09:42:31  GMT  EAGLE5 42.0.0

PCA          Mate PCA     SSN RC MULT SRM MRC GRP NAME SSO
244-012-007               252 10  SOL *N  *N  GRP01    OFF

MAP TABLE IS (5 of 1024) 1 % FULL
```

`rtrv-map:pca=002-002-002`

This is an example of the possible output.

```
rlghncxa03w 10-07-25 09:42:31  GMT  EAGLE5 42.0.0

PCA          Mate PCA     SSN RC MULT SRM MRC GRP NAME SSO
002-002-002               254 10  SOL *N  *N  GRP01    OFF

MAP TABLE IS (5 of 1024) 1 % FULL
```

If the DPC is shown in the `rtrv-map` command output (in the `PCA`, `PCI`, `PCN`, `PCN24`, `MPCA`, `MPCI`, `MCPN`, or `MPCN24` fields), go to the "Removing a Mated Application" procedure in *Database Administration - GTT User's Guide*, and remove the remove the point code from the mated application that references the DPC.

If no entries are shown in the `rtrv-map` output, or the "Removing a Mated Application" procedure was performed in this step, continue the procedure with 6.

6. Verify that the **IGTTLS** feature is enabled, by entering the `rtrv-ctrl-feat` command with the IGTTLS part number. Enter this command.

   `rtrv-ctrl-feat:partnum=893006901`

   The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Intermed GTT Load Sharing 893006901  on      ----

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial
Period Left

Zero entries found.
The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   - If the `rtrv-ctrl-feat` output in 6 shows that the IGTTLS feature is not enabled, continue the procedure with 8.
   - If the `rtrv-ctrl-feat` output in 6 shows that the IGTTLS feature is enabled, continue the procedure with 7.

7. Verify whether or not the DPC is in the mated relay node table using the `rtrv-mrn` command, specifying the destination point code being removed from the database. For this example, enter these commands.

   `rtrv-mrn:pca=244-012-007`

   This is an example of the possible output.

```
rlghncxa03w 09-05-07 00:34:31 GMT EAGLE5 41.0.0

     PC             RC
     007-007-007    10
     008-001-001    20
     240-012-007    30
     008-001-003    40
     008-001-004    50
     008-001-005    60
     008-001-006    70
     008-001-007    80
     008-001-008    90


MRN table is (39 of 3000) 1% full.
```

`rtrv-mrn:pca=002-002-002`

This is an example of the possible output.

```
rlghncxa03w 10-07-07 00:34:31 GMT EAGLE5 42.0.0

     PC              RC
     002-002-002     10
     009-001-001     20
     009-001-003     40
     009-001-004     50
     009-001-005     60
     009-001-006     70
     009-001-007     80
     009-001-008     90


MRN table is (39 of 3000) 1% full.
```

If the destination point code is shown in the `rtrv-mrn` command output, remove the point code from the MRN table, by executing the "Removing an MRN Group or MRN Group Entry" procedure in *Database Administration - GTT User's Guide*.

8. Verify whether or not the DPC is defined as an end office internal point code using the `rtrv-rmt-appl` command. This is an example of the possible output.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
IPCA              SI  SSN
003-003-003       3   100, 110-119, 200
                  5

IPCI              SI  SSN
3-003-3           3   5, 50-100, 250
                  5

IPCN              SI  SSN
10-12-0-0-fr      3   250
                  5

IPCN24            SI  SSN
```

If the destination point code is shown in the `rtrv-rmt-appl` command output, go to the “Removing an End Node Internal Point Code” procedure in *Database Administration - IP7 User's Guide* to remove the internal point code.

9. If the point code being removed in this procedure is a proxy point code, the proxy point code cannot be removed if the proxy point code is assigned to a destination point code or assigned to a linkset. Proxy point codes are shown in the `rtrv-dstn` output with the entry `PRX=yes`.

   a. If the number of proxy point codes is not shown in `rtrv-dstn` output in 1, there are no proxy codes in the database. Continue the procedure with 15.Continue the procedure by performing one of these steps.

Continue the procedure with 15 if the destination point code is not an ANSI point code.

Continue the procedure with 12 if the destination point code is an ANSI point code.

b. If the number of proxy point codes are shown in `rtrv-dstn` output in 1, verify whether or not the DPC being removed is a proxy point code. Display the DPC being removed in this procedure using the `rtrv-dstn` command specifying the point code being removed. For this example, enter this command.

`rtrv-dstn:dpca=002-002-002`

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI         BEI ELEI    ALIASI
ALIASN/N24    DMN
   002-002-002    ----------- no  --- ----------
--------------    SS7

   PPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------   ---- yes     15     on    17       no     no
none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   38
    EXCEPTION DPC(s):               3
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 3
    Proxy DPC (s)                   2
    TOTAL DPC(s):                  47
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

- If the DPC is a proxy point code, shown by the value `YES` in the `PRX` column, continue the procedure with 10.
- If the DPC is not a proxy point code, continue the procedure with 15.continue the procedure by performing one of these steps.
  – Continue the procedure with 15 if the destination point code is not an ANSI point code.
  – Continue the procedure with 12 if the destination point code is an ANSI point code.

10. Display the linksets in the database that have the proxy point code assigned to them by entering the `rtrv-ls` command with the `ppc` parameter. The `ppc` parameter value is the proxy point code being removed in this procedure. For this example, enter this command.

```
rtrv-ls:ppc=002-002-002
```

This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:16:37 EDT EAGLE5 37.0.0

PPCA = 002-002-002
                                            L3T SLT               GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls1305         000-005-000    none 1   1   no  A   1    off off off no
off
e1m1s2         001-001-002    none 1   1   no  A   7    off off off no
off

Link set table is (10 of 1024) 1% full.
```

The linksets displayed in this step have the proxy point code assigned to them. Perform the Removing a Linkset Containing SS7 Signaling Links procedure to remove these linksets. After the linksets have been removed, continue the procedure with 11.

If no linksets are displayed in this step, then no linksets have the proxy point code assigned to them. Continue the procedure with 11.

11. Display the point codes in the database that have the proxy point code assigned to them by entering the `rtrv-dstn` command with the `ppc` parameter. The `ppc` parameter value is the proxy point code being removed in this procedure. For this example, enter this command.

```
rtrv-dstn:ppc=002-002-002
```

This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:16:37 EDT EAGLE5 41.0.0

PPCA    =    002-002-002

   DPCA          CLLI        BEI ELEI   ALIASI           ALIASN/N24     DMN
   000-005-000   ----------- no  --- ----------      --------------     SS7
   001-001-002   ----------- no  --- ----------      --------------     SS7

Destination table is (42 of 2000) 2% full
Alias table is (29 of 8000) 1% full
PPC table is (2 of 10) 10% full
```

If no point codes are displayed in this step, then no point codes have the proxy point code assigned to them. Continue the procedure with 15.Continue the procedure by performing one of these steps.

- Continue the procedure with 15 if the destination point code is not an ANSI point code.
- Continue the procedure with 12 if the destination point code is an ANSI point code.

If point codes are displayed in this step, these point codes have the proxy point code assigned to them. Remove these point codes by entering the `dlt-dstn` with the point code value shown in the `rtrv-dstn` output.

For this example, enter these commands.

`dlt-dstn:dpca=000-005-000`

`dlt-dstn:dpca=001-001-002`

When the `dlt-dstn` command has successfully completed, and the Cluster Routing and Management Diversity feature is turned off (`CRMD = off` in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
Destination table is (40 of 2000) 2% full
PPC table is (2 of 10) 20% full
DLT-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), this is an example of the message that should appear when the `dlt-dstn` command has successfully completed.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   36
    EXCEPTION DPC(s):               3
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 3
    Proxy DPC (s)                   2
    TOTAL DPC(s):                  45
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

After the point codes have been removed, continue the procedure with 15.continue the procedure by performing one of these steps.

- Continue the procedure with 15 if the destination point code is not an ANSI point code.
- Continue the procedure with 12 if the destination point code is an ANSI point code.

12. Verify whether or not the destination point code is a member of a cluster point code by entering the `rtrv-dstn` command with these parameters and values.
    - The `dpca` parameter containing the network and cluster values of the destination point code.
    - Three asterisks (***) for the network-cluster member value of the point code.

    For this example, enter these commands.

```
rtrv-dstn:dpca=240-012-***
```

This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:00:32 GMT  EAGLE5 43.0.0
   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   240-012-*     rlghncbb000 yes yes ----------      --------------   SS7
   240-012-004   rlghncbb001 yes ---    1-111-1         10-13-9-3-fr  SS7
   240-012-005   rlghncbb002 yes ---    1-112-2         10-13-10-0-ge SS7
   240-012-006   rlghncbb003 yes ---    1-112-3         10-13-10-1-fr SS7
   240-012-007   ----------- yes ---    1-117-3         10-13-11-1-fr SS7
   240-012-008   ----------- yes ---    1-113-5         10-13-10-2-ge SS7

   Destination table is (45 of 2000) 2% full
   Alias table is (29 of 8000) 1% full
```

```
rtrv-dstn:dpca=002-002-***
```

This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:00:32 GMT  EAGLE5 43.0.0
   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   002-002-002   ----------- yes --- ----------      --------------   SS7

Destination table is (45 of 2000) 2% full
Alias table is (29 of 8000) 1% full
```

Continue the procedure by performing one of these steps.

- Continue the procedure with 15 if the destination point code is not a member of the cluster point code.
- Continue the procedure with 13 if the destination point code is a member of a cluster point code.

13. Display the attributes of the cluster point code shown in 12 by entering the `rtrv-dstn` command with the cluster point code shown in 12.

    For this example, enter this command.

    `rtrv-dstn:dpca=240-012-*`

    This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:00:32 GMT  EAGLE5 43.0.0
   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   240-012-*     rlghncbb000 yes yes ----------      --------------   SS7

   SPCA         NCAI      RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  no        none   off   none     no     no    none

   Destination table is (45 of 2000) 2% full
   Alias table is (29 of 8000) 1% full
```

Continue the procedure by performing one of these steps.

- Continue the procedure with 15 if the `NCAI` value of the cluster point code is `yes`.
- Continue the procedure with 14 if the `NCAI` value of the cluster point code is `no`.

14. Display the route exception table entries referencing the destination point code by entering the `rtrv-rtx` command with the destination point code that is being removed in this procedure. For this example, enter these commands.

    `rtrv-rtx:dpca=240-012-007`

    This is an example of the possible output.

```
rlghncxa03w 10-12-07 00:34:31 GMT EAGLE5 43.0.0

   DPCA           RTX-CRITERIA              LSN         RC     APC

   240-012-007    OPCA
                  007-007-007               ls01        1
002-004-100

 DESTINATION ENTRIES ALLOCATED:   2000
     FULL DPC(s):                   38
     EXCEPTION DPC(s):               3
     NETWORK DPC(s):                 1
     CLUSTER DPC(s):                 3
     TOTAL DPC(s):                  45
     CAPACITY (% FULL):              1%
 ALIASES ALLOCATED:               8000
     ALIASES USED:                  29
     CAPACITY (% FULL):              1%
 X-LIST ENTRIES ALLOCATED:         500
```

    `rtrv-rtx:dpca=002-002-002`

    This is an example of the possible output.

```
rlghncxa03w 10-12-07 00:34:31 GMT EAGLE5 43.0.0

   DPCA           RTX-CRITERIA              LSN         RC     APC

   002-002-002    OPCA
                  007-007-007               ls01        1
002-004-100

DESTINATION ENTRIES ALLOCATED:   2000
     FULL DPC(s):                  38
     EXCEPTION DPC(s):              3
     NETWORK DPC(s):                1
     CLUSTER DPC(s):                3
     TOTAL DPC(s):                 45
     CAPACITY (% FULL):             1%
```

```
 ALIASES ALLOCATED:             8000
     ALIASES USED:                29
     CAPACITY (% FULL):            1%
 X-LIST ENTRIES ALLOCATED:       500
```

If the destination point code that is being removed in this procedure is not shown in the `rtrv-rtx` output, continue the procedure with 15.

If the destination point code that is being removed in this procedure is shown in the `rtrv-rtx` output, perform the Removing a Route Exception Entry procedure to remove all the route exception table entries shown in this step. After the exception routes have been removed, continue the procedure with 15.

15. Remove the destination point code from the database, using the `dlt-dstn` command. For this example, enter these commands.

    `dlt-dstn:dpca=240-012-007`

    `dlt-dstn:dpca=002-002-002`

    When the `dlt-dstn` command has successfully completed, and the Cluster Routing and Management Diversity feature is turned off (`CRMD = off` in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
Destination table is (41 of 2000) 2% full
DLT-DSTN: MASP A - COMPLTD
```

    If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), this is an example of the message that should appear when the `dlt-dstn` command has successfully completed.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   36
    EXCEPTION DPC(s):               1
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 3
    TOTAL DPC(s):                  41
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
DLT-DSTN: MASP A - COMPLTD
```

    If a proxy point code quantity is enabled and and the Cluster Routing and Management Diversity feature is turned off (shown with the `CRMD = off` entry in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
Destination table is (41 of 2000) 2% full
```

```
Alias table is (27 of 12000) 1% full
PPC table is (1 of 10) 10% full
DLT-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), and a proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 09-05-17 15:35:05 GMT EAGLE5 41.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   33
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    Proxy DPC (s)                   1
    TOTAL DPC(s):                  37
    CAPACITY (% FULL):             2%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
DLT-DSTN: MASP A - COMPLTD
```

16. Verify the changes using the `rtrv-dstn` command with the **DPC** specified in 15. For this example, enter these commands.

    `rtrv-dstn:dpca=240-012-007`

    `rtrv-dstn:dpca=002-002-002`

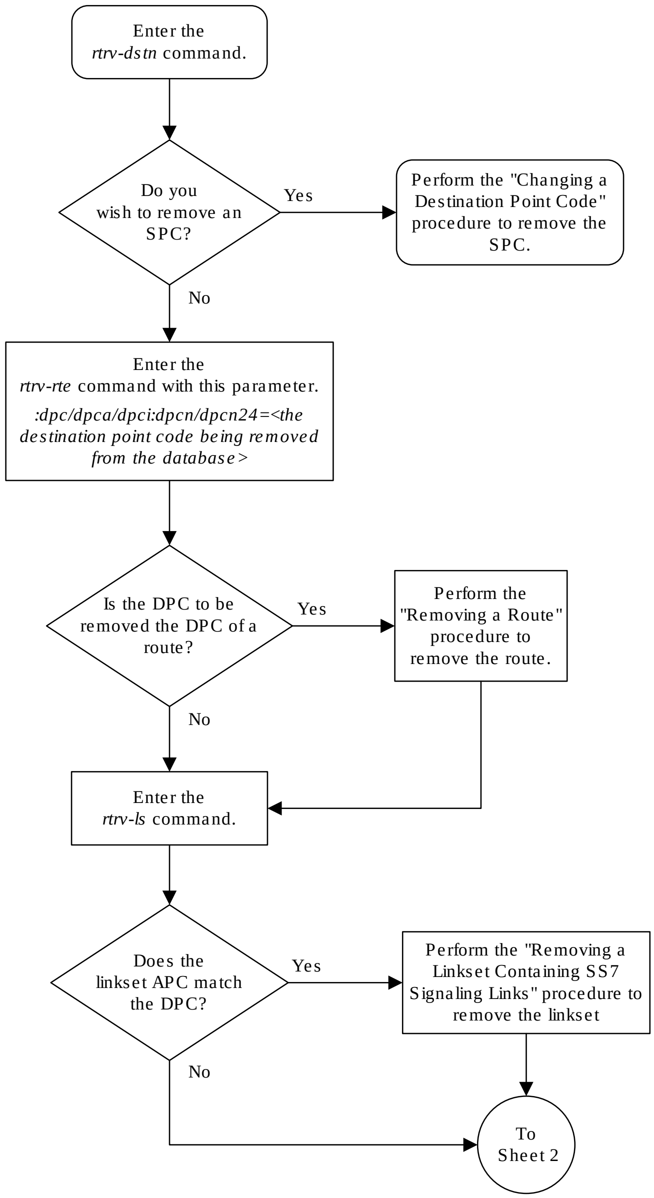
    This is an example of the possible output for both of these commands.

```
rlghncxa03w 09-05-17 16:02:05 GMT  EAGLE5 41.0.0

No destinations meeting the requested criteria were found

Destination table is (36 of 2000) 2% full
Alias table is (27 of 8000) 1% full
```

17. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command. These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

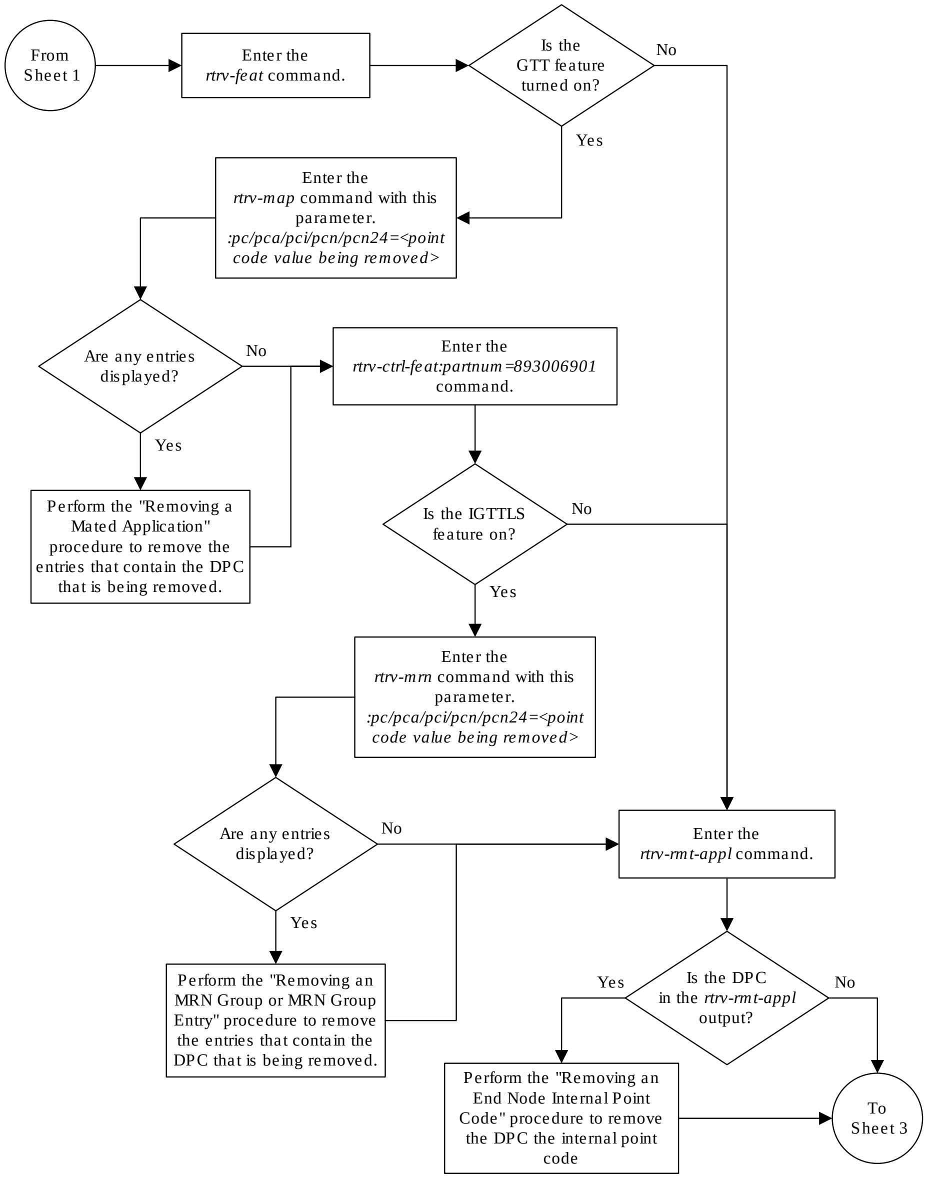
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 2-31 Removing a Destination Point Code



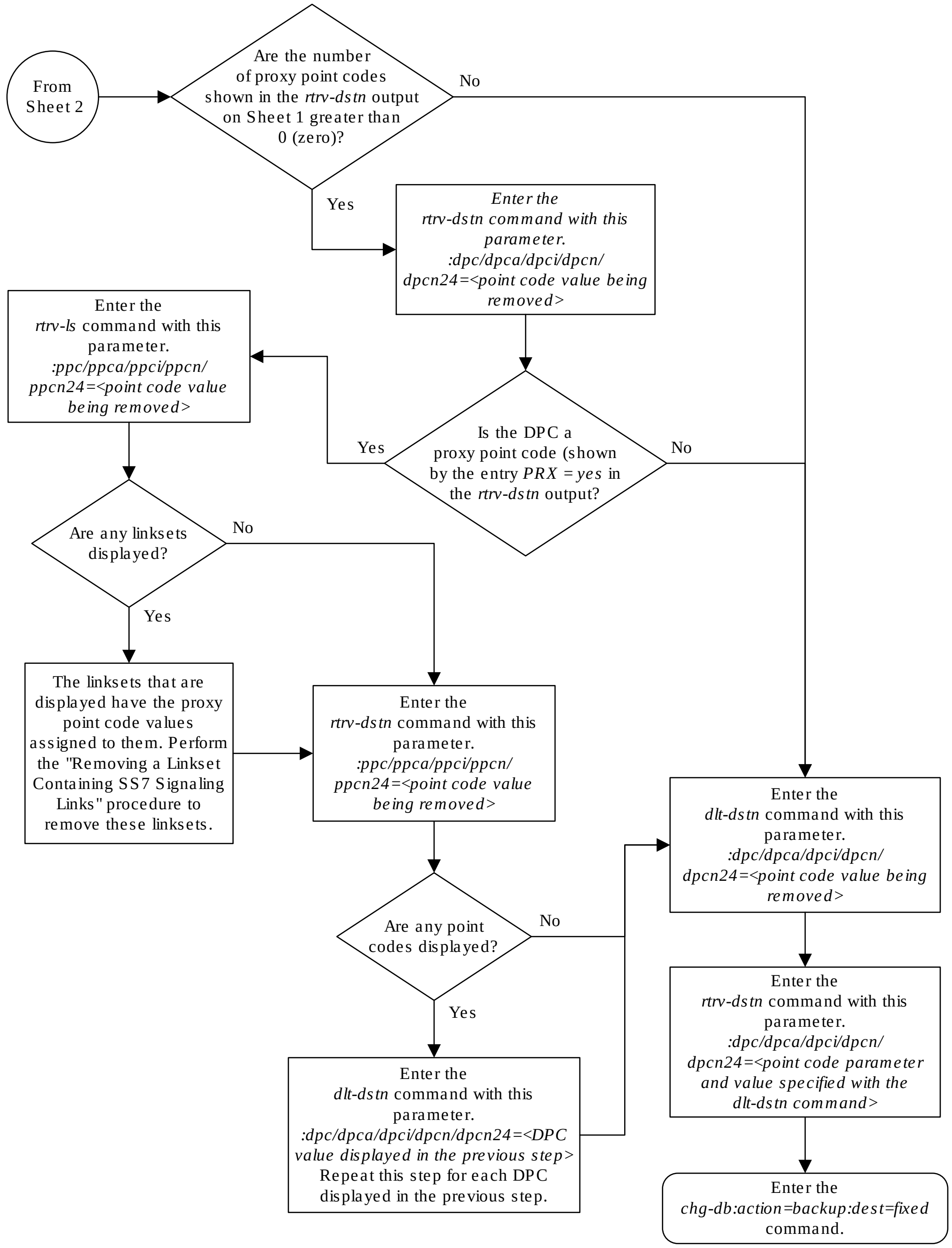
Sheet 1 of 3

Sheet 1 of 4

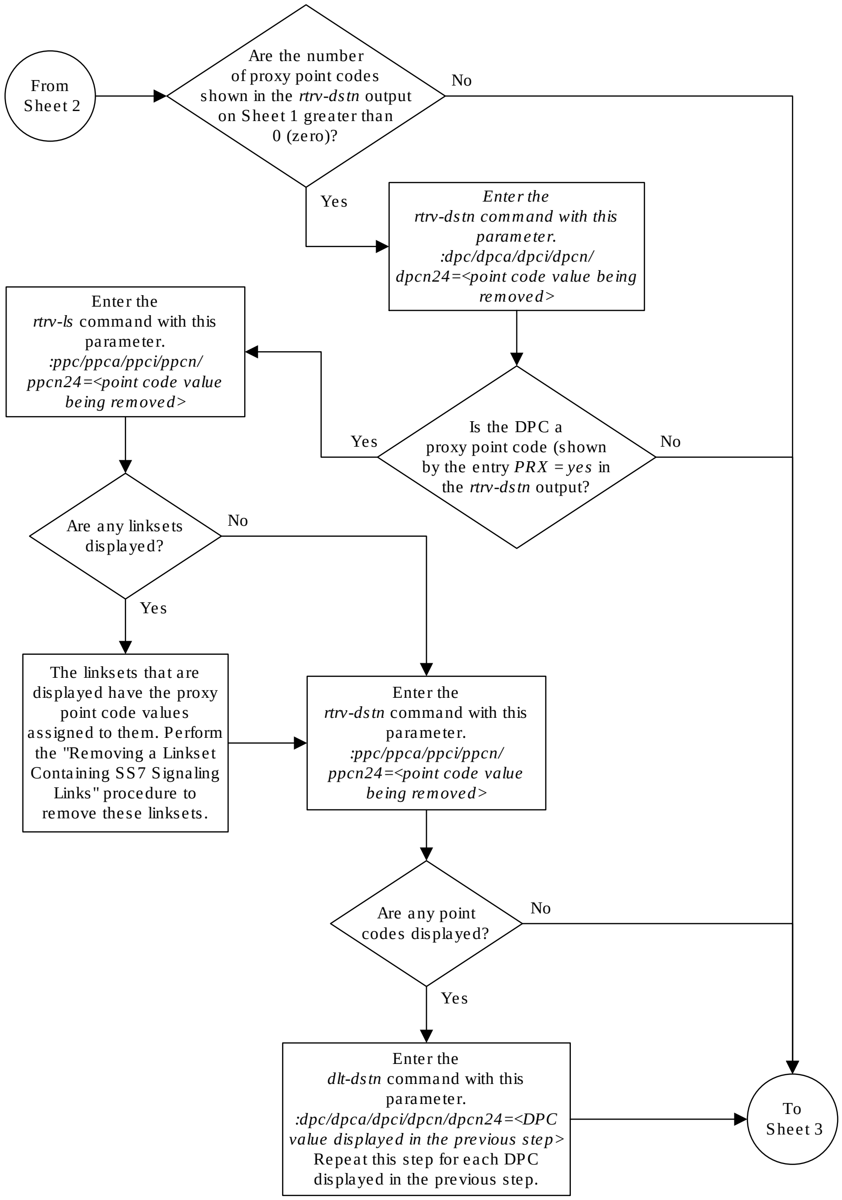


Sheet 2 of 3

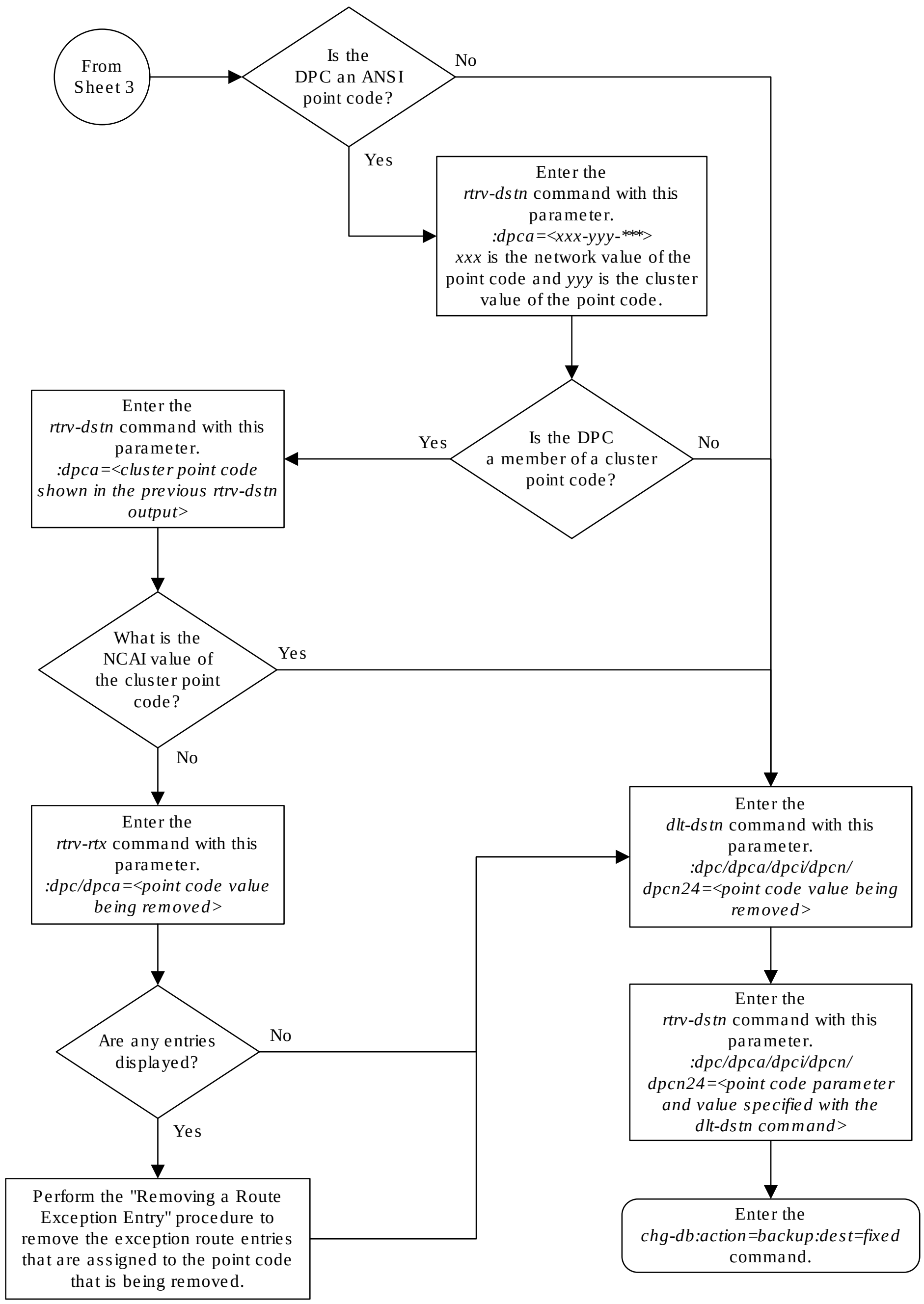
Sheet 2 of 4


From Sheet 2
Are the number of proxy point codes shown in the rtrv-dstn output on Sheet 1 greater than 0 (zero)?
No
Yes
Enter the rtrv-dstn command with this parameter. :dpc/dpca/dpci/dpcn/ dpcn24=<point code value being removed>
Is the DPC a proxy point code (shown by the entry PRX = yes in the rtrv-dstn output?
Yes
No
Enter the rtrv-ls command with this parameter. :ppc/ppca/ppci/ppcn/ ppcn24=<point code value being removed>
Are any linksets displayed?
No
Yes
The linksets that are displayed have the proxy point code values assigned to them. Perform the "Removing a Linkset Containing SS7 Signaling Links" procedure to remove these linksets.
Enter the rtrv-dstn command with this parameter. :ppc/ppca/ppci/ppcn/ ppcn24=<point code value being removed>
Are any point codes displayed?
No
Yes
Enter the dlt-dstn command with this parameter. :dpc/dpca/dpci/dpcn/dpcn24=<DPC value displayed in the previous step> Repeat this step for each DPC displayed in the previous step.
Enter the dlt-dstn command with this parameter. :dpc/dpca/dpci/dpcn/ dpcn24=<point code value being removed>
Enter the rtrv-dstn command with this parameter. :dpc/dpca/dpci/dpcn/ dpcn24=<point code parameter and value specified with the dlt-dstn command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 3 of 3


From Sheet 2
Are the number of proxy point codes shown in the rtrv-dstn output on Sheet 1 greater than 0 (zero)?
No
Yes
Enter the rtrv-dstn command with this parameter. :dpc/dpca/dpci/dpcn/dpcn24=<point code value being removed>
Is the DPC a proxy point code (shown by the entry PRX = yes in the rtrv-dstn output?
Yes
No
Enter the rtrv-ls command with this parameter. :ppc/ppca/ppci/ppcn/ppcn24=<point code value being removed>
Are any linksets displayed?
No
Yes
The linksets that are displayed have the proxy point code values assigned to them. Perform the "Removing a Linkset Containing SS7 Signaling Links" procedure to remove these linksets.
Enter the rtrv-dstn command with this parameter. :ppc/ppca/ppci/ppcn/ppcn24=<point code value being removed>
Are any point codes displayed?
No
Yes
Enter the dlt-dstn command with this parameter. :dpc/dpca/dpci/dpcn/dpcn24=<DPC value displayed in the previous step> Repeat this step for each DPC displayed in the previous step.
To Sheet 3

Sheet 3 of 4



Sheet 4 of 4

2.23 Changing a Destination Point Code

This procedure is used to change the attributes of a full destination point code in the database, using the `chg-dstn` command.

To change the attributes of a cluster point code, go to the Changing the Attributes of a Cluster Point Code procedure.

This procedure cannot be used to change a true point code (dpc/dpca/dpci/dpcn/dpcn24), or a proxy point code value assigned to a DPC. To change a true point code or a proxy point code value assigned to a DPC, the destination point code must be removed, then re-entered. Perform the Removing a Destination Point Code procedure to remove the point code from the database. To add the new point code, perform one of these procedures:

- Cluster point code – Adding a Cluster Point Code
- Network routing point code – Adding a Network Routing Point Code
- All other point codes – Adding a Destination Point Code

> **Note:**
>
> To add a proxy point code, the point code cannot be a cluster point code or a network routing point code.

The destination point code to be changed must be in the database.

The `chg-dstn` command uses these parameters:

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code in the database being changed.

`:aliasa/aliasi/aliasn/aliasn24` – The alternate destination point code. Two optional alias addresses can be defined.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes. A private point code cannot be used as an alias point code.

`:clli` – The **Common Language Location Identifier** assigned to this point code

`:bei` – Broadcast exception indicator that indicates whether transfer-prohibited (**TFP**) messages will be broadcast from this node. The `bei=yes` parameter means TFPs will not be broadcast. The `bei=no` parameter means TFPs will be broadcast.

`:spc/spca/spci/spcn/spcn24` – The secondary point code as defined by the `ent-spc` command. The secondary point code allows the EAGLE to use another point code in addition to the one defined by the `dpc`, `dpca`, `dpci`, `dpcn`, or `dpcn24` parameters of the `chg-dstn` command for SS7 routing purposes. See the Multiple Point Code Support section for more information on secondary point codes. A private point code cannot be used as a secondary point code.

`:prx` – This parameter specified whether or not the destination point code is proxy point code. This parameter has two values, `yes` or `no`. If the `prx` parameter value is `yes`, the destination point code is a proxy point code. If the `prx` parameter value is `no`, the destination point code is not a proxy point code. To specify the `prx=yes` parameter, the destination point code value must be a full point code, in the SS7 domain, and cannot be a private point code. The destination point code value cannot have the `ipgwapc=yes` parameter value assigned.

To specify the `prx=no` parameter, the proxy point code cannot be assigned to a destination point code or assigned to a linkset. Proxy point codes are shown in the `rtrv-dstn:dpc=<DPC being changed>` output with the entry `PRX=yes`. To verify if the proxy point code is assigned to a destination point code, enter the `rtrv-dstn` command with the `ppc` parameter equal to the proxy point code value. This will display all the destination point codes that reference the proxy point code. These destination point codes must be removed before the `prx=no` parameter can be specified..

To verify if the proxy point code is assigned to a linkset, enter the `rtrv-ls` command with the `ppc` parameter equal to the proxy point code value. This will display all the linksets that reference the proxy point code. These linksets must be removed before the proxy point code can be removed.

`:nprst` - NM bits reset. This parameter specifies whether the NM bits in an ITU IAM message should be set to 00. This parameter has two values.

- `off` - Do not set NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
- `on` - Set the NM bits to 00 in an ITU IAM message if the `nptype` option value in the `rtrv-tifopts` output is `nm`.
  The default value for this parameter is `off`.

`:rcause` - Release cause. This parameter specifies the condition that triggers the sending of a Release message. This parameter has these values.

- 0 - 127
- `none` - use the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.
  The default value for this parameter is `none`.

  If the `rlcopc` parameter value in the `rtrv-tipopts` output is on and a value of 0-127 is specified for the `rcause` parameter, then the `rcause` parameter value overrides the values specified for the `rcausenp` and `rcausepfx` parameters in the `rtrv-tifopts` output.

`:splitiam` - This parameter specifies how and when to split an ITU IAM message into one IAM message and one SAM message. This parameter has these values.

- 15-31 - The maximum number of CdPN digits allowed in the IAM message before the splitting occurs. The remaining digits, up to a total of 32, are encoded in the SAM message.
- `none` - the value specified for the `splitiam` parameter in the `rtrv-tifopts` output is used to determine when to split the IAM message.
  The default value for this parameter is `none`.

To specify the `nprst` or `rcause` parameters, the TIF Number Portability feature, part number 893018901, must be enabled. To specify the `splitiam` parameter, at least one of these features must be enabled.

- TIF Number Portability - part number 893018901
- TIF SCS Forwarding - part number 893022201

- TIF Simple Number Substitution - part number 893024001
- TIF Additional Subscriber Data - part number 893024501
- TIF Generic Routing Number - part number 893025501
  The status of these features is shown in the `rtrv-ctrl-feat` output. Perform the procedures in *TIF - User's Guide* to enable these features.

`:homescp` - This parameter specifies whether the destination point code should be considered a home **SCP** when performing SCCP processing for messages that have no global title address digits (the global title indicator (GTI) is set to zero). This parameter cannot be specified for a cluster point code or a network routing point code. These are the values for this parameter.

- yes- the specified DPC is considered a home SCP.
- no - the specified DPC is not considered a home SCP.

`:homesmsc` - This parameter specifies whether the destination point code (DPC) should be considered a home **SMSC** when performing SCCP processing for messages that have no global title address digits (the global title indicator (GTI) is set to zero). This parameter cannot be specified for a cluster point code or a network routing point code. These are the values for this parameter.

- yes- the specified DPC is considered a home SMSC.
- no - the specified DPC is not considered a home SMSC.

`:sccpmsgcnv` - The `sccpmsgcnv` parameter controls SCCP UDT(S)/XUDT(S) message conversion for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. The `rtrv-ctrl-feat` output shows the status of the XUDT UDT Conversion feature. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature. This parameter contains these values.

- none - SCCP UDT(S)/XUDT(S) message conversion is not required on messages for the destination.
- udt2xudt - All UDT(S) messages for the destination are converted to XUDT(S) messages.
- xudt2udt - All non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages. Segmented XUDT(S) messages for the destination are not converted to UDT(S) messages.
- sxudt2udt - All segmented and non-segmented XUDT(S) messages for the destination are converted to UDT(S) messages.

The `elei` and `ncai` parameters cannot be specified in this procedure. To use these parameters to provision a destination point code, perform the Changing the Attributes of a Cluster Point Code procedure.

Secondary point codes must be a full point code. A secondary point code can only be assigned to a full point code in the SS7 domain. Secondary point codes cannot be assigned to DPCs that have proxy point codes assigned to them. The same secondary point code value cannot be assigned to DPCs and to linksets The network type of the secondary point code must match the network type of the destination point code. The secondary point code used in this procedure must be configured in the database with the `ent-spc` command. The secondary point codes are shown in the `SPCA`, `SPC-I`, SPC-N, and SPC-N24 fields of the rtrv-spc command output. If the desired secondary point code is not shown in the output of the rtrv-spc command, perform the Adding a Secondary Point Code procedure to configure the desired point code as a secondary point code.

If a secondary point code is assigned to the destination point code, the group code of the 14-bit ITU-N destination point code must match the group code of the secondary point code. Otherwise, the group code of the destination point code must match the group code assigned to the EAGLE's true 14-bit ITU-N point code, shown in the PCN field of the rtrv-sid output.

The value none for the spca, spci, spcn, or spcn24 parameters removes the assignment of the current secondary point code and leaves the destination point code without a secondary point code.

The value of the clli parameter cannot be in the destination point code table and cannot match the **CLLI** of the EAGLE. Verify this by entering the rtrv-dstn and the rtrv-sid commands. If the value of the clli parameter matches any CLLI values in either of these outputs, choose another value for the clli parameter that does not match any CLLIs shown in either of these command outputs.

To enter point codes of any network type (**ANSI**, ITU-I, or ITU-N - 14-bit or 24-bit) into the database with the chg-dstn command, the self ID of the EAGLE must be defined for these networks. Verify this with the rtrv-sid command.

If a point code value is shown in the PCA field of the rtrv-sid command, then ANSI point codes can be specified with the chg-dstn command.

If a point code value is shown in the PCI field of the output of the rtrv-sid command, then ITU-I point codes can be specified with the chg-dstn command. The PCI column of the rtrv-sid output can contain spare and non-spare point code values. To provision ITU-I non-spare point codes in this procedure, the rtrv-sid output must contain an ITU-I non-spare point code in the PCI column. To provision ITU-I spare point codes in this procedure, the rtrv-sid output must contain an ITU-I spare point code in the PCI column.

If a point code value is shown in the PCN field of the output of the rtrv-sid command, then 14-bit ITU-N point codes can be specified with the chg-dstn command. The PCN column of the rtrv-sid output can contain spare and non-spare point code values. To provision 14-bit ITU-N non-spare point codes in this procedure, the rtrv-sid output must contain a 14-bit ITU-N non-spare point code in the PCN column. To provision 14-bit ITU-N spare point codes in this procedure, the rtrv-sid output must contain a 14-bit ITU-N spare point code in the PCN column.

If a point code value is shown in the PCN24 field of the output of the rtrv-sid command, then 24-bit ITU-N point codes can be specified with the chg-dstn command.

If no values are shown in the PCA, PCI, PCN, or PCN24 fields in the rtrv-sid command output, the self-identification of the EAGLE must be updated with an ANSI point code, ITU international point code or a 14-bit ITU national point code. Perform the Changing the Self-Identification of the EAGLE procedure to change the self-identification of the EAGLE.

> **Note:**
>
> The EAGLE can contain 14-bit ITU national point codes or 24-bit ITU national point codes, but both at the same time.

Private point codes cannot be specified in the self-identification of the EAGLE, therefore, private point codes can be added as long as the self identification of the EAGLE contains a point code with the same network type as the private point code being added in this procedure. The ITU National and International **Spare Point Code** Support feature does not have to be enabled to add a private point code.

The type of alias point code that can be provisioned with the `chg-dstn` command is dependent on the type of DPC that is being provisioned. Table 2-17 shows the DPC and alias point type combinations that can be used with the `chg-dstn` command.

Table 2-17 Destination Point Code Type and Alias Point Code Type Combinations

DPC Type	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)	DPC TYPE	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)
ANSI	no alias specified	no alias specified	**ITU-I**	no alias specified	no alias specified
	ITU-I	no alias specified		ANSI	no alias specified
	ITU-I	ITU-N		ANSI	ITU-N
	ITU-I	ITU-N Spare		ANSI	ITU-N Spare
	ITU-I	ITU-N24		ANSI	ITU-N24
	ITU-I Spare	no alias specified		ITU-I Spare	no alias specified
	ITU-I Spare	ITU-N		ITU-I Spare	ITU-N
	ITU-I Spare	ITU-N Spare		ITU-I Spare	ITU-N Spare
	ITU-I Spare	ITU-N24		ITU-I Spare	ITU-N24
	ITU-N	no alias specified		ITU-N	no alias specified
	ITU-N Spare	no alias specified		ITU-N (Note 9)	ITU-N Spare (Note 9)
	ITU-N24	no alias specified		ITU-N Spare	no alias specified
ITU-I Spare	no alias specified	no alias specified		ITU-N24	no alias specified
	ANSI	no alias specified	**ITU-N**	no alias specified	no alias specified
	ANSI	ITU-N		ANSI	no alias specified
	ANSI	ITU-N Spare		ANSI	ITU-I
	ANSI	ITU-N24		ANSI	ITU-I Spare
	ITU-I	no alias specified		ITU-I	no alias specified
	ITU-I	ITU-N		ITU-I (Note 8)	ITU-I Spare (Note 8)
	ITU-I	ITU-N Spare		ITU-I Spare	no alias specified
	ITU-I	ITU-N24		ITU-N Spare	no alias specified
	ITU-N	no alias specified		ITU-N Spare	ITU-I

Table 2-17 (Cont.) Destination Point Code Type and Alias Point Code Type Combinations

DPC Type	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)	DPC TYPE	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)
	ITU-N (Note 9)	ITU-N Spare (Note 9)		ITU-N Spare	ITU-I Spare
	ITU-N Spare	no alias specified	**ITU-N24**	no alias specified	no alias specified
	ITU-N24	no alias specified		ANSI	no alias specified
ITU-N Spare	no alias specified	no alias specified		ANSI	ITU-I
	ANSI	no alias specified		ANSI	ITU-I Spare
	ANSI	ITU-I		ITU-I	no alias specified
	ANSI	ITU-I Spare		ITU-I Spare	no alias specified
	ITU-I	no alias specified			
	ITU-I (Note 8)	ITU-I Spare (Note 8)			
	ITU-I Spare	no alias specified			
	ITU-N	no alias specified			
	ITU-N	ITU-I			
	ITU-N	ITU-I Spare			

Table 2-17 (Cont.) Destination Point Code Type and Alias Point Code Type Combinations

DPC Type	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)	DPC TYPE	Alias Point Code Type (See Notes 1 - 7)	Alias Point Code Type (See Notes 1 - 7)

Notes:

1. ANSI alias point codes are specified with the`aliasa` parameter.
2. ITU-I and ITU-I Spare alias point codes are specified with the`aliasi` parameter.
3. ITU-N and ITU-N Spare alias point codes are specified with the`aliasn` parameter.
4. ITU-N24 alias point codes are specified with the`aliasn24` parameter.
5. If the alias point code parameter is not specified, the parameter's value is not changed.
6. If the value`none` is specified for an alias point code parameter, the current value for that parameter is removed from the DPC.
7. The new alias point code value replaces the current alias point code value that is assigned to the DPC.
8. To specify the ITU-I and ITU-I Spare alias point codes for the DPC, both point code values are specified with the`aliasi` parameter and the values are separated by a comma. For example, to specify the alias point codes 2-005-7 and s-3-002-1, the aliasi parameter is specified like this;`aliasi=2-005-7,s-3-002-1`. The`aliasa` and`aliasn` parameters cannot be specified for the DPC.
9. To specify the ITU-N and ITU-N Spare alias point codes for the DPC, both point code values are specified with the`aliasn` parameter and the values are separated by a comma. For example, to specify the alias point codes 00010 and s-00020, the aliasn parameter is specified like this;`aliasn=00010,s-00020`. The`aliasa` and`aliasi` parameters cannot be specified for the DPC.

Alias point codes can only be specified for full point code entries and must be full point codes.

Destination point codes and alias point codes must be unique in the database. A point code cannot be defined as a true destination point code and an alias point code.

The EAGLE can contain the quantities of alias point codes shown in Table 2-18 depending the features that are enabled or turned on.

Table 2-18 Maximum Alias Point Code Quantities

Feature Status	Maximum Alias Point Code Quantity
The 5000 Routes feature is off and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
The 5000 Routes feature is on and 6000, 7000, 8000, or 10,000 routesets are not enabled	12000
6000 routesets are enabled	12000
7000 routesets are enabled	8000
8000 routesets are enabled	8000

Table 2-18 (Cont.) Maximum Alias Point Code Quantities

Feature Status	Maximum Alias Point Code Quantity
10,000 routesets are enabled	10000

If either the `dpcn` or `aliasn` parameters are specified with the `chg-dstn` command, the format of the 14-bit ITU-N point code values must match the format shown in the `NPCFMTI` field of the `rtrv-stpopts` command output. For more information, refer to the 14-Bit ITU National Point Code Formats section.

Canceling the `RTRV-DSTN` Command

Because the `rtrv-dstn` command used in this procedure can output information for a long period of time, the `rtrv-dstn` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` command can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` command was entered
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` command was entered
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` command was entered, from another terminal other than the terminal where the `rtrv-dstn` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current destination point codes using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   007-*-*       ----------- yes --- ----------      --------------    SS7
   030-045-*     rlghncbb010 yes yes ----------      --------------    SS7
   111-011-*     rlghncbb000 yes yes ----------      --------------    SS7
   240-012-004   rlghncbb001 yes ---    1-111-1         10-13-9-3-fr   SS7
   240-012-005   rlghncbb002 yes ---    1-112-2         10-13-10-0-ge  SS7
   240-012-006   rlghncbb003 yes ---    1-112-3         10-13-10-1-fr  SS7
   240-012-007   ----------- yes ---    1-117-3         10-13-11-1-fr  SS7
   240-012-008   ----------- yes ---    1-113-5         10-13-10-2-ge  SS7

   DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24     DMN
   2-131-1       rlghncbb023 no  ---    222-210-000     11-11-8-1-ge   SS7
   2-131-2       ----------- no  ---    222-211-001     11-11-8-2-fr   SS7
   2-131-3       ----------- no  ---    222-211-002     11-11-8-3-ge   SS7
   4-163-5       ----------- no  ---    250-200-007  --------------    SS7
```

```
   DPCN           CLLI        BEI ELEI   ALIASA
ALIASI         DMN
   7-9-10-1-fr   --------    no  ---    210-090-100
1-75-6         SS7
   7-9-10-1-ge   --------    no  ---    210-100-100
2-175-6        SS7
   10-15-2-3-fr  rlghncbb013 no  ---    222-200-200
2-121-1        SS7
   10-15-2-3-ge  rlghncbb013 no  ---    222-100-200
2-100-1        SS7
   10-15-3-0-fr  rlghncbb013 no  ---    222-200-201
2-121-2        SS7
   10-15-3-0-ge  rlghncbb013 no  ---    222-100-201
2-100-2        SS7

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

If a quantity of proxy point codes is enabled, the number of proxy point codes that are provisioned in the database are shown at the end of the `rtrv-dstn` output as shown in this example.

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   31
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    Proxy DPC (s)                   2
    TOTAL DPC(s):                  36
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  22
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

This procedure cannot be used to change the DPC value (`dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`). To change the DPC value, the destination point code must be removed, then re-entered. Perform the Removing a Destination Point Code procedure to remove the point code from the database. To add the new point code, perform one of these procedures.

- Cluster point code – Adding a Cluster Point Code
- Network routing point code – Adding a Network Routing Point Code
- All other point codes – Adding a Destination Point Code

If the DPC value is not being changed, continue the procedure with 2.

2. Display all the attributes of the point code being changed, using the `rtrv-dstn` command with either the `dpca`, `dpci`, `dpcn`, or `dpcn24` parameters.

   For this example, enter this command.

   `rtrv-dstn:dpca=240-012-007`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   240-012-007   ----------- yes ---    1-117-3         10-13-11-1-fr  SS7

   SPCA         NCAI  PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------  ----  no      none    off  none     no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

   If a proxy point code is assigned to the DPC, and you wish to change the proxy point code assigned to the DPC, the DPC must be removed, then re-entered with the new proxy point code value. Perform the Removing a Destination Point Code procedure to remove the point code from the database. To add the new point code, perform one of these procedures.

   - Cluster point code – Adding a Cluster Point Code
   - Network routing point code – Adding a Network Routing Point Code
   - All other point codes – Adding a Destination Point Code

   If a proxy point code is not assigned to the DPC, continue the procedure with 3.

3. To change the attributes of a DPC, these entities must be checked depending on how the attributes of the DPC will be changed. Perform these commands and procedures as required depending on how the attributes of the DPC will be changed.

   The type of point code being added, ANSI, ITU-I, ITU-N, ITU-N24 must be shown in the `rtrv-dstn` output or the `rtrv-sid` output. If the point code type is not shown in the `rtrv-dstn` output, perform the `rtrv-sid` command in 4. If the point code type is not shown in the `rtrv-dstn` and `rtrv-sid` outputs, perform the Adding a Point Code to the Self-Identification of the EAGLE procedure to add a point code of the desired point code type.

If the new point code will be a 14-bit ITU-N point code, and a group code will be assigned to the point code, the group code must be defined in `rtrv-sid` output in 4, `rtrv-dstn`output in 1, or `rtrv-spc` output in 5. If the group code is not shown in either of these outputs, perform the Adding a Point Code to the Self-Identification of the EAGLE procedure to add an entry with the desired group code. If the group code will be different from the ones shown in the `rtrv-sid` or `rtrv-dstn` outputs, perform the Adding a Secondary Point Code procedure to add a secondary point code with the desired group code.

If a secondary point code value will be changed, the new secondary point code must be shown in the `rtrv-spc` output in 5. If the new secondary point code is shown in the `rtrv-spc` output, and the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, the new secondary point code cannot be the secondary point code of a linkset. Enter the `rtrv-ctrl-feat` command in 8 to verify if the Multiple Linksets to Single Adjacent PC feature is enabled and turned on. If the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, enter the `rtrv-ls` command in 6 with the `spc/spca/spci/spcn/spcn24` parameter with the new secondary point code value from the `rtrv-spc` output. It the secondary point code is not shown in the `rtrv-spc` output, perform the Adding a Secondary Point Code procedure to add the desired secondary point code. The `spc/spca/spci/spcn/spcn24` parameter cannot be specified for a DPC that contains a proxy point code, shown the `PPCA/PPCI/PPCN/PPCN24` field when the individual DPC is displayed.

If the `clli` parameter value will be changed, the new `clli` parameter value cannot be shown in the `rtrv-sid` or `rtrv-dstn` outputs. Enter the `rtrv-sid` command in 4 to verify the CLLI value in the self-identification of the EAGLE.

The format of a 14-bit ITU-N point code must match the format defined by the `NPCFMTI` value in the `rtrv-stpopts` output. Enter the `rtrv-stpopts` in 7 to verify the `NPCFMTI` value. If you wish to change the format, perform 14-Bit ITU National Point Code Formats.

To specify an alias point code with the DPC, specifying the new alias point code cannot exceed the maximum alias point code quantity shown in the `ALIASES ALLOCATED:` or the `Alias table` row in the `rtrv-dstn` output. If the maximum alias point code quantity will be exceeded, remove enough alias point codes to allow the new alias point code to be added. Enter the `chg-dstn` command with the DPC that contains the alias point code that is being removed and with the `aliasa/aliasi/aliasn/aliasn24=none` parameter. Enter this command as needed to remove the required number of alias point codes.

If the `nprst` or `rcause` parameters will be specified with the DPC, the TIF Number Portability feature must be enabled. If the current `rcause` value is `none` and the current `nprst` value is `off`, enter the `rtrv-ctrl-feat` command in 8 to verify that the feature is enabled. If the feature is not enabled, perform the procedures in *TIF - User's Guide* to enable the TIF Number Portability feature.

If the `splitiam` parameter will be specified with the DPC, at least one of these features must be enabled.

- TIF Number Portability
- TIF SCS Forwarding

- TIF Simple Number Substitution
- TIF Additional Subscriber Data
- TIF Generic Routing Number
  If the current `splitiam` value is `none`, enter the `rtrv-ctrl-feat` command in 8 to verify if any of these features are enabled. If none of these features are enabled, perform the procedures in *TIF - User's Guide* to enable one of more of these features.

If the `prx=yes` parameter will be specified with the DPC, the Proxy Point Code feature must be enabled. The addition of the proxy point code with the `prx=yes` parameter cannot exceed the enabled proxy point code quantity, shown in the `PPC table` or `PROXY DPC(s):` row of the `rtrv-dstn` output. Enter the `rtrv-ctrl-feat` command in 8 to verify if a proxy point code quantity is enabled. If a proxy point code quantity is enabled, the Proxy Point Code feature is enabled. To enable the Proxy Point Code feature or increase the proxy point code quantity, perform the Changing the Proxy Point Code Quantity procedure. The `prx=yes` parameter cannot be specified for the DPC if any of these conditions are present.

- If the enabled quantity is 100 and 100 proxy point codes are in the database.
- If the DPC is a private point code, a cluster point code, a network routing point code, or the adjacent point code of an IPGWx linkset. The private point codes, cluster point codes, and network routing point codes are shown in the `rtrv-dstn` output. Display the linkset with the `rtrv-ls` command in 10, then re-enter the `rtrv-ls` command in 11 with the name of the linkset that has the DPC as its adjacent point code to verify if the linkset is an IPGWx linkset.

If the current `PRX` value is `yes`, the `PRX` value cannot be changed if the DPC is referenced by other point codes as a proxy point code. Enter the `rtrv-dstn` command in 9 with the `ppc/ppca/ppci/ppcn/ppcn24` parameter and the DPC that is being changed to verify if the proxy point code is referenced by other point codes. Perform the Removing a Destination Point Code procedure to remove the point code that reference the proxy point code.

The `sccpmsgcnv` parameter specifies the kind of conversion performed on messages for the specified destination. This parameter can be specified only if the XUDT UDT Conversion feature is enabled and turned on. Enter the `rtrv-ctrl-feat` command in 8 to verify that the XUDT UDT Conversion feature is enabled and turned on. If the XUDT UDT Conversion feature is not enabled or turned on, perform the "Activating the XUDT UDT Conversion Feature" procedure in *Database Administration - GTT User's Guide* to enable and turn on the XUDT UDT Conversion feature.

After the required entities have been verified and provisioned, continue the procedure with 12.

4. Display the EAGLE self-identification, using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT  EAGLE5 37.0.0
   PCA              PCI          PCN               CLLI
PCTYPE
   100-100-100      3-75-7       7-9-8-1-fr        rlghncxa03w       OTHER

   CPCA
   002-002-002        002-002-003        002-002-004        002-002-005
```

```
   002-002-006       002-002-007       002-002-008      002-002-009
   004-002-001       004-003-003       050-060-070

   CPCA (LNP)
   005-005-002       005-005-004       005-005-005

   CPCI
   1-002-1           1-002-2           1-002-3          1-002-4
   2-001-1           7-222-7

   CPCN
   2-0-10-3-fr       2-0-11-0-fr       2-0-11-2-fr      2-0-12-1-fr
   2-2-3-3-fr        2-2-4-0-fr        10-14-10-1-fr
```

5. Display the secondary point codes in the database with the `rtrv-spc` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
SPC (Secondary Point Codes)
SPCA
    001-010-010
    002-010-010
    003-010-010
    010-100-010
SPC-I
        1-253-5
        2-254-6
        3-255-7
        4-100-1
SPC-N
       10-1-11-1-ge
       13-2-12-0-ge
       14-15-12-1-ge
SPC-N24
none
Secondary Point Code table is (11 of 40) 28% full
```

6. A secondary point code cannot be added to a DPC if that secondary point code is assigned to any linksets.

   Display the linksets that have the secondary point code assigned to them by entering the `rtrv-ls` command with either the `spc/spca`, `spci`, `spcn`, or `spcn24` parameters.

   For this example, enter this command.

   `rtrv-ls:spca=010-100-010`

   This is an example of the possible output.

```
rlghncxa03w 07-05-19 17:06:08 EST  37.5.0

SPCA = 010-100-010
                                 L3T SLT              GWS GWS GWS
```

```
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn1          000-007-000   none 1   1   no  PRX 0    off off off no
off
lsn2          001-001-001   none 1   1   no  PRX 0    off off off no
off

Link set table is (11 of 1024) 1% full.
```

7. Display the existing values for the `npcfmti` parameter by entering the `rtrv-stpopts` command.

   The value for the `npcfmti` parameter is shown in the `NPCFMTI` field. This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
STP OPTIONS
-----------------------
NPCFMTI        4-4-4-2
```

> **Note:**
>
> The`rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-stpopts` command, see the`rtrv-stpopts` command description in *Commands User's Guide*.

8. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:
```

```
Feature Name                Partnum
Zero entries found.
```

9. Display the point codes in the database that have the proxy point code assigned to them by entering the `rtrv-dstn` command with the `ppc/ppca/ppci/ppcn/ppcn24` parameter. The `ppc/ppca/ppci/ppcn/ppcn24` parameter value is the proxy point code being removed in this procedure. For this example, enter this command.

   `rtrv-dstn:ppca=002-002-002`

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:16:37 EDT EAGLE5 41.0.0

   DPCA           CLLI         BEI ELEI   ALIASI
ALIASN/N24    DMN
   000-005-000   ----------- no  --- ----------
--------------   SS7
   PRX = no      PPC =    002-002-002

   001-001-002   ----------- no  --- ----------
--------------   SS7
   PRX = no      PPC =    002-002-002

   Destination table is (11 of 2000) 1% full
   Alias table is (0 of 12000) 0% full
   PPC table is (2 of 10) 20% full
```

10. Display the linksets in the database by entering the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2          001-207-000   none 1   1   no  B   6    off off off
no    off
ls1305        000-005-000   none 1   1   no  A   1    off off off
no    off
ls1307        000-007-000   none 1   1   no  A   1    off off off
no    off
e1m1s1        001-001-001   none 1   1   no  A   7    off off off
no    off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off
no    off
lsn10         240-012-007   none 1   1   no  A   1    off off off
no    off
ls20          002-002-002   none 1   1   no  PRX 1    off off off
no off

                                 L3T SLT              GWS GWS GWS
```

```
LSN           APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none 1   1   no  B   4    off off off ---   on
ls1315        0-015-0       none 1   1   no  A   1    off off off ---
off
ls1317        0-017-0       none 1   1   no  A   1    off off off ---   on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off ---
off

Link set table is (10 of 1024) 1% full.
```

11. Display the attributes of the linkset shown in 10 whose APC is the DPC being changed by entering the `rtrv-ls` command with the `lsn` parameter.

    For this example, enter this command.

    `rtrv-ls:lsn=lsn10`

    This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:16:37 EDT EAGLE5 37.0.0

                                    L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn10         240-012-007   none 1   1   no  A   1    off off off no
off

           CLLI         TFATCABMLQ MTPRSE ASL8
           -----------  1          ---    no

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           yes     ---------- 200   100    % 80      % CdPA


           LOC  PORT SLC TYPE
           1211 A     0  SS7IPGW

Link set table is (10 of 1024) 1% full.
```

12. Change the destination point code using the `chg-dstn` command.

    If alias point code values will be changed, Table 2-17 shows the DPC and alias point type combinations that can be used with the `chg-dstn` command.

    For this example, enter these commands.

```
chg-
dstn:dpca=240-012-007:clli=ls09clli:bei=no:aliasi=2-66-1 :aliasn=
0-10-13-3-
fr:spca=003-010-010:homescp=yes:homesmsc=yes:sccpmsgcnv=udt2xudt
```

```
chg-dstn:dpci=2-131-2:aliasn=8-10-2-0-fr,s-9-11-1-3-fr
```

```
chg-dstn:dpcn=10-15-3-0-fr:aliasi=3-150-7,s-3-125-2
```

If the point code is being changed to a proxy point code, the `prx=yes` parameter must be specified. The point code cannot be a private point code, cannot have the `ipgwapc=yes` parameter assigned, and cannot be a cluster or network routing point code.

If the point code is being changed from a proxy point code to a non-proxy point code, the `prx=no` parameter must be specified. The proxy point code cannot be assigned to a linkset or to other destination point codes.

An SPC cannot be assigned to a destination point code if the SPC is assigned to a linkset.

If the `aliasn` parameter is specified with the `chg-dstn` command, make sure that the format of the ITU national alias point code matches the format shown in the `NPCFMTI` field of the `rtrv-stpopts` command output shown in 7 or with the format that was defined when the procedure in the 14-Bit ITU National Point Code Formats section was performed in 3.

When this command has successfully completed, and the Cluster Routing and Management Diversity feature is turned off (`CRMD = off` in the `rtrv-feat` command output), and no proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
Destination table is (24 of 2000) 1% full
Alias table is (29 of 8000) 1% full
CHG-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), and no proxy point code quantity is enabled, this message should appear when each command has successfully completed.

```
rlghncxa03w 07-05-17 15:35:05 GMT EAGLE5 37.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
CHG-DSTN: MASP A - COMPLTD
```

If a proxy point code quantity is enabled and the Cluster Routing and Management Diversity feature is turned off (shown with the `CRMD = off` entry in the `rtrv-feat` command output), this message should appear.

```
rlghncxa03w 06-10-17 15:35:05 GMT EAGLE5 36.0.0
Destination table is (24 of 2000) 1% full
```

```
Alias table is (29 of 12000) 1% full
PPC table is (2 of 10) 20% full
ENT-DSTN: MASP A - COMPLTD
```

If the Cluster Routing and Management Diversity feature is turned on (`CRMD = on` in the `rtrv-feat` command output), and a proxy point code quantity is enabled, this message should appear.

```
rlghncxa03w 06-10-17 15:35:05 GMT EAGLE5 36.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   24
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 2
    Proxy DPC(s):                   2
    TOTAL DPC(s):                  28
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  27
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
ENT-DSTN: MASP A - COMPLTD
```

13. Verify the changes using the `rtrv-dstn` command, and specifying the destination point code that was entered in 12.
    a. If an ANSI destination point code was changed in 12, use the `dpca` parameter to display the attributes of the destination point code.
    b. If an ITU international destination point code was changed in 12, use the `dpci` parameter to display the attributes of the destination point code.
    c. If a 14-bit ITU national destination point code was changed in 12, use the `dpcn` parameter to display the attributes of the destination point code.
    d. If a 24-bit ITU national destination point code was changed in 12, use the `dpcn24` parameter to display the attributes of the destination point code.

       For this example, enter these commands.

       `rtrv-dstn:dpca=240-012-007`

       This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24
DMN
   240-012-007   ls09clli    no  ---    2-66-1          0-10-13-3-fr
SS7

   SPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   003-010-010  ---- no      none   off   none     yes    yes
udt2xudt
```

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpci=2-131-2
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCI           CLLI         BEI ELEI    ALIASN
ALIASN        DMN
   2-131-2       ----------- no  ---     8-10-2-0-fr
s-9-11-1-3-fr  SS7

   SPCI          NCAI PRX      RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  ---- no       none   off   none     no     no
none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

```
rtrv-dstn:dpcn=10-15-3-0-fr
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN           CLLI         BEI ELEI    ALIASI
ALIASI        DMN
   10-15-3-0-fr  rlgnncbb013 no  ---     3-150-7
s-3-125-2      SS7
```

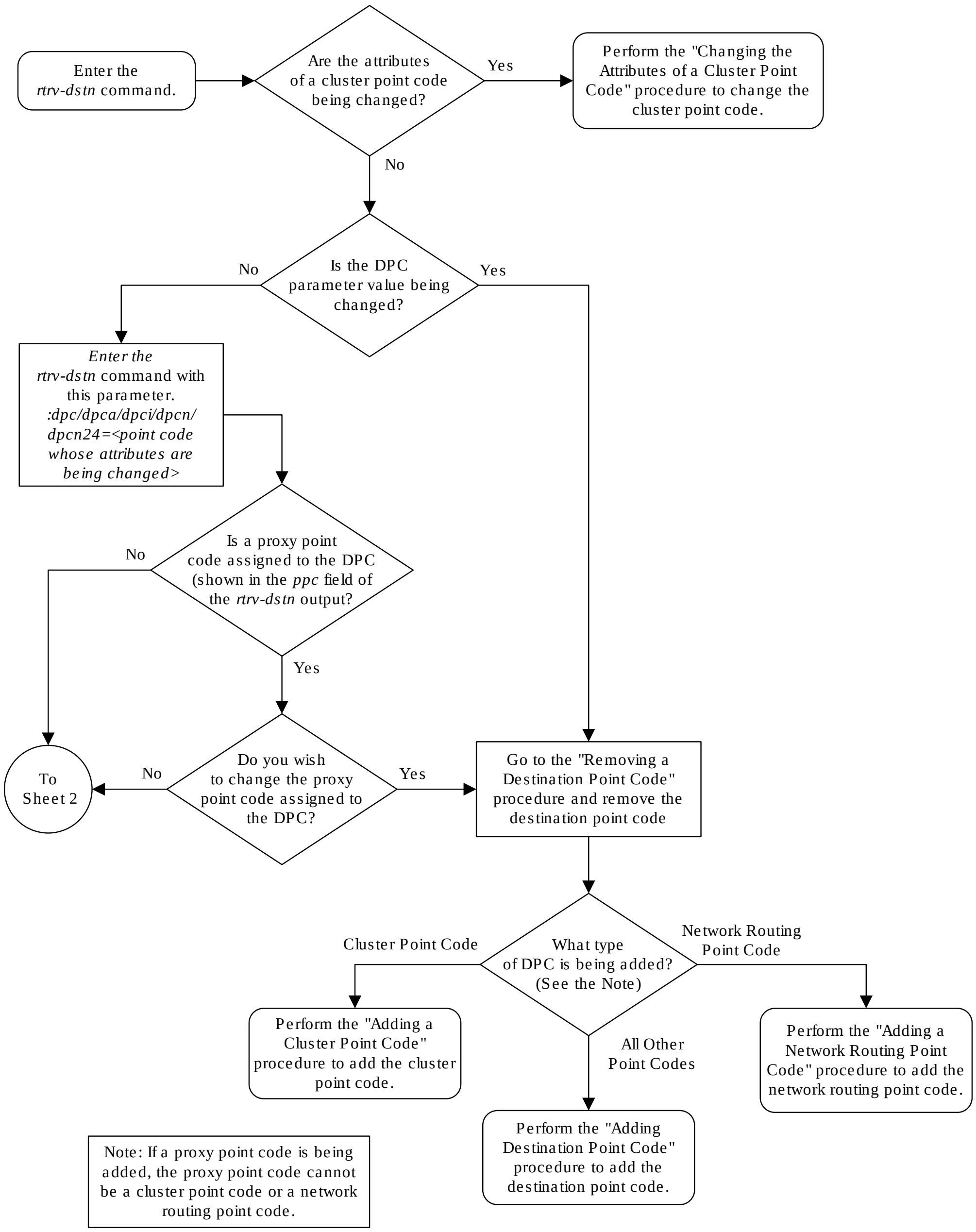
```
   SPCN         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  ---- no      none   off   none      no     no    none

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   21
    EXCEPTION DPC(s):               0
    NETWORK DPC(s):                 1
    CLUSTER DPC(s):                 2
    TOTAL DPC(s):                  24
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:               8000
    ALIASES USED:                  29
    CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:         500
RTRV-DSTN: MASP A - COMPLTD
```

14. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 2-32 Changing a Destination Point Code



Sheet 1 of 4

From Sheet 1

To change the attributes of a DPC, these entities must be checked depending on how the attributes of the DPC will be changed. Perform the commands and procedures as required depending on how the attributes of the DPC will be changed.

The type of point code being added, ANSI, ITU-I, ITU-N, ITU-N24 must be shown in the *rtrv-dstn* output or the *rtrv-sid* output. If the point code type is not shown in the *rtrv-dstn* output, perform the *rtrv-sid* command. If the point code type is not shown in the *rtrv-dstn* and *rtrv-sid* outputs, perform the Adding a Point Code to the Self-Identification of the EAGLE 5 ISS to add a point code of the desired point code type.

If the new point code will be a 14-bit ITU-N point code, and a group code will be assigned to the point code, the group code must be defined in *rtrv-sid*, *rtrv-dstn*, or *rtrv-spc* outputs. If the group code is not shown in either of these outputs, perform the Adding a Point Code to the Self-Identification of the EAGLE 5 ISS procedure to add an entry with the desired group code. If the group code will be different from the ones shown in the *rtrv-sid* or *rtrv-dstn* outputs, perform the Adding a Secondary Point Code procedure to add a secondary point code with the desired group code.

If a secondary point code value will be changed, the new secondary point code must be shown in the *rtrv-spc* output. If the new secondary point code is shown in the *rtrv-spc* output, and the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, the new secondary point code cannot be the secondary point code of a linkset. Enter the *rtrv-ctrl-feat* command to verify if the Multiple Linksets to Single Adjacent PC feature is enabled and turned on. If the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, enter the *rtrv-ls* command with the *spc/spca/spci/spcn/spcn24* parameter with the new secondary point code value from the *rtrv-spc* output. It the secondary point code is not shown in the *rtrv-spc* output, perform the Adding a Secondary Point Code to add the desired secondary point code. The *spc/spca/spci/spcn/spcn24* parameter cannot be specified for a DPC that contains a proxy point code, shown the *PPCA/PPCI/PPCN/PPCN24* field when the individual DPC is displayed.

If the *clli* parameter value will be changed, the new *clli* parameter value cannot be shown in the *rtrv-sid* or *rtrv-dstn* outputs. Enter the *rtrv-sid* command to verify the *CLLI* value in the self-identification of the EAGLE 5 ISS.

The format of a 14-bit ITU-N point code must match the format defined by the *NPCFMTI* value in the *rtrv-stpopts* output. Enter the *rtrv-stpopts* to verify the *NPCFMTI* value. If you wish to change the format, perform the 14-Bit ITU National Point Code Formats procedure.

To specify an alias point code with the DPC, specifying the new alias point code cannot exceed the maximum alias point code quantity shown in the *ALIASES ALLOCATED:* or the *Alias table* row in the *rtrv-dstn* output. If the maximum alias point code quantity will be exceeded, remove enough alias point codes to allow the new alias point code to be added. Enter the *chg-dstn* command with the DPC that contains the alias point code that is being removed and with the *aliasa/aliasi/aliasn/aliasn24=none* parameter. Enter this command as needed to remove the required number of alias point codes.

If the *nprst* or *rcause* parameters will be specified with the DPC, the TIF Number Portability feature must be enabled. If the current *rcause* value is *none* and the current *nprst* value is *off*, enter the *rtrv-ctrl-feat* command to verify that the feature is enabled. If the feature is not enabled, perform the procedures in *Feature Manual - TIF* to enable the TIF Number Portability feature.

If the *splitiam* parameter will be specified with the DPC, at least one of these features must be enabled.

- TIF Number Portability
- TIF SCS Forwarding
- TIF Simple Number Subsstitution
- TIF Additional Subscriber Data
- TIF Generic Routing Number

If the current *splitiam* value is *none*, enter the *rtrv-ctrl-feat* command to verify if any of these features are enabled. If none of these features are enabled, perform the procedures in *Feature Manual - TIF* to enable one of more of these features.

To Sheet 3

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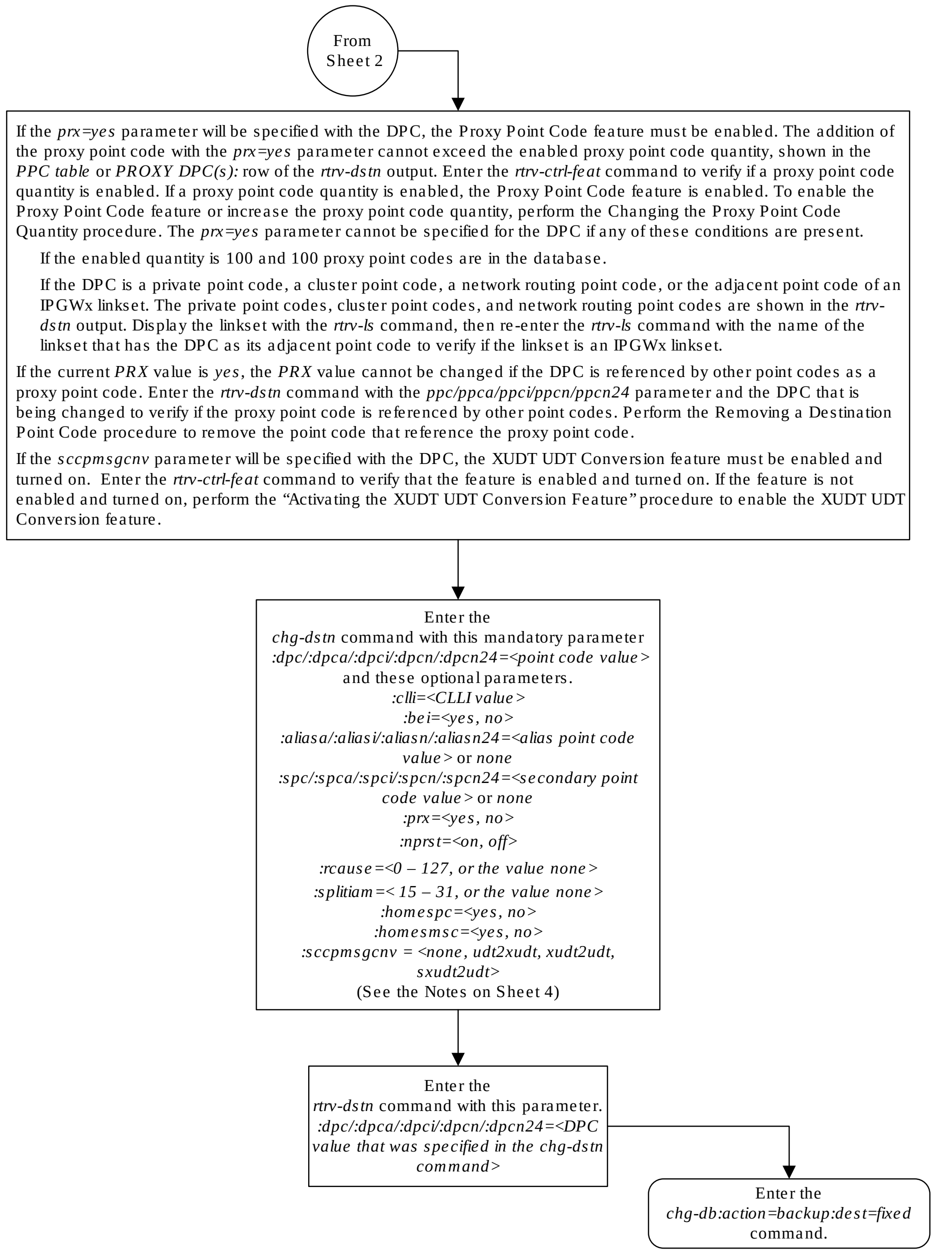
From Sheet 2
If the prx=yes parameter will be specified with the DPC, the Proxy Point Code feature must be enabled. The addition of the proxy point code with the prx=yes parameter cannot exceed the enabled proxy point code quantity, shown in the PPC table or PROXY DPC(s): row of the rtrv-dstn output. Enter the rtrv-ctrl-feat command to verify if a proxy point code quantity is enabled. If a proxy point code quantity is enabled, the Proxy Point Code feature is enabled. To enable the Proxy Point Code feature or increase the proxy point code quantity, perform the Changing the Proxy Point Code Quantity procedure. The prx=yes parameter cannot be specified for the DPC if any of these conditions are present.
If the enabled quantity is 100 and 100 proxy point codes are in the database.
If the DPC is a private point code, a cluster point code, a network routing point code, or the adjacent point code of an IPGWx linkset. The private point codes, cluster point codes, and network routing point codes are shown in the rtrv-dstn output. Display the linkset with the rtrv-ls command, then re-enter the rtrv-ls command with the name of the linkset that has the DPC as its adjacent point code to verify if the linkset is an IPGWx linkset.
If the current PRX value is yes, the PRX value cannot be changed if the DPC is referenced by other point codes as a proxy point code. Enter the rtrv-dstn command with the ppc/ppca/ppci/ppcn/ppcn24 parameter and the DPC that is being changed to verify if the proxy point code is referenced by other point codes. Perform the Removing a Destination Point Code procedure to remove the point code that reference the proxy point code.
If the sccpmsgcnv parameter will be specified with the DPC, the XUDT UDT Conversion feature must be enabled and turned on. Enter the rtrv-ctrl-feat command to verify that the feature is enabled and turned on. If the feature is not enabled and turned on, perform the “Activating the XUDT UDT Conversion Feature” procedure to enable the XUDT UDT Conversion feature.
Enter the chg-dstn command with this mandatory parameter
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<point code value>
and these optional parameters.
:clli=<CLLI value>
:bei=<yes, no>
:aliasa/:aliasi/:aliasn/:aliasn24=<alias point code value> or none
:spc/:spca/:spci/:spcn/:spcn24=<secondary point code value> or none
:prx=<yes, no>
:nprst=<on, off>
:rcause=<0 – 127, or the value none>
:splitiam=< 15 – 31, or the value none>
:homespc=<yes, no>
:homesmsc=<yes, no>
:sccpmsgcnv = <none, udt2xudt, xudt2udt, sxudt2udt>
(See the Notes on Sheet 4)
Enter the rtrv-dstn command with this parameter.
:dpc/:dpca/:dpci/:dpcn/:dpcn24=<DPC value that was specified in the chg-dstn command>
Enter the chg-db:action=backup:dest=fixed command.

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Notes:

1. One or more optional parameters must be specified

2. The values for parameters not specified with the *chg-dstn* command will not be changed.

3. The *:dpc*/*:dpca*/*:dpci*/*:dpcn*/*:dpcn24*, *:aliasa*/*:aliasi*/*:aliasn*/*:aliasn24*, and *:spc*/*:spca*/*:spci*/*:spcn*/*:spcn24* parameters are used to provision either ANSI, ITU-I, 14-bit ITU-N, or 24-bit ITU-N point codes.

:dpc/*:dpca*, *:spc*/*:spca*, *:aliasa* = ANSI DPC, private ANSI DPC, SPC, alias point code

:dpci, *:spci*, *:aliasi* = ITU-I DPC (non-spare point code, spare point code, private point code, private spare point code), SPC (non-spare or spare point code), alias point code (non-spare or spare point code)

:dpcn, *:spcn*, *:aliasn* = 14-bit ITU-N DPC (non-spare point code, spare point code, private point code, private spare point code), SPC (non-spare or spare point code), alias point code (non-spare or spare point code)

:dpcn24, *:spcn24*, *:aliasn24* = 24-bit ITU-N DPC, private 24-bit ITU-N DPC, SPC, alias point code

4. The network type of alias point codes cannot be the same as the network type of the DPC.

If the DPC is ANSI, then either ITU-I or ITU-N (14-bit or 24-bit) alias point codes can be assigned.

If the DPC is ITU-I, then either ANSI or ITU-N (14-bit or 24-bit) alias point codes can be assigned.

If the DPC is either a 14-bit or a 24-bit ITU-N, then either ITU-I or ANSI alias point codes can be assigned.

5. The EAGLE 5 ISS can contain 14-bit ITU-N point codes or 24-bit ITU-N point codes, but not both at the same time.

6. The value *none* for the *:aliasa*/*:aliasi*/*:aliasn*, and *:spc*/*:spca*/*:spci*/*:spcn* parameters removes the alias point code or SPC from the DPC.

7. The network type of an SPC must be the same as the network type of the DPC.

8. The alias point code and SPC value must be full point codes.

9. The alias point code value cannot be shown in the *rtrv-dstn* output.

10. The NI and NC values of an ANSI point code cannot be the same as the NI and NC values of any cluster point code shown in the *rtrv-dstn* output.

11. The *rtrv-sid* output must show values in the PCA, PCI, PCN, or PCN24 fields before a DPC of the network type corresponding these fields can be added.

12. The CLLI value being added cannot be shown in the *rtrv-sid* output.

13. The SPC value must be show in the *rtrv-spc* output.

14. If a 14-bit ITU-N DPC is being added and the ITU Duplicate Point Code feature is on, and no SPC is being assigned the DPC, the group code assigned to the DPC must be the same as the group code value shown in the PCN field of the *rtrv-sid* output.

15. If a 14-bit ITU-N DPC is being added and the ITU Duplicate Point Code feature is on, and an SPC is being assigned the DPC, the group code assigned to the DPC must be the same as the group code assigned to the SPC.

16. The format of 14-bit ITU-N point codes must match the format defined by the NPCFMTI value of the *rtrv-stpopts* output.

17. The EAGLE 5 ISS can contain these quantities of alias point codes depending the features that are enabled or turned on.

5000 routes is not turned on, 6000, 7000, 8000, or 10,000 routesets is not enabled – 12,000 alias point codes

5000 routes is turned on, 6000, 7000, 8000, or 10,000 routesets is not enabled – 12,000 alias point codes

6000 routesets are enabled – 12,000 alias point codes

7000 routesets are enabled – 8000 alias point codes

8000 routeset are enabled – 8000 alias point codes

10,000 routesets are enabled – 10,000 alias point codes

The number of alias point codes is shown in the *chg-dstn* and *rtrv-dstn* outputs.

18. To change a DPC to a proxy point code with the *prx=yes* parameter, the DPC cannot be a private point code and the DPC cannot be a cluster point code or a network routing point code. The DPC cannot APC of a linkset whose *ipgwapc* parameter value is *yes*.

19. To change a proxy point code to a non-proxy point code with the *prx=no* parameter, the proxy point code cannot be assigned to any linksets or DPCs.

20. An SPC cannot be assigned to a DPC that has a proxy point code assigned to it.

21. The type of alias point code that can provisioned is dependent on the type of DPC that is being provisioned. Refer to the Destination Point Code and Alias Point Code Type Combinations table in the "Changing a Destination Point Code" procedure located in the *Database Administration Manual – SS7* for the alias point code parameter combinations.

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2.24 Changing the Group Code Assigned to a 14-Bit ITU National Point Code

This procedure is used to change the group code that is assigned to a 14-bit **ITU** national point code. The 14-bit ITU national point code to be changed must be in the database.

To change a group code assigned to a ITU national point code, a duplicate point code with the new group code must be configured in the database with a route, linkset, and signaling link to the new destination. Then the 14-bit ITU national point code with the old group code with its route can be removed from the database.

The `chg-dstn` command cannot be used to change the group code assigned to 14-bit ITU national point codes.

The examples in this procedure are used to remove the group code assigned to ITU national destination point code `7-9-10-1-aa to 7-9-10-1-de`. The format of the 14-bit ITU national point codes used in these examples is 4-4-4-2.

Canceling the RTRV-DSTN and RTRV-RTE Commands

Because the `rtrv-dstn` and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-dstn` and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-dstn` and `rtrv-rte` commands can be canceled:

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered, from another terminal other than the terminal where the `rtrv-dstn` or `rtrv-rte` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display all the attributes of the 14-bit ITU national point code whose group code is being changed, using the `rtrv-dstn` command with the `dpcn` parameter.

   For this example, enter this command.

   `rtrv-dstn:dpcn=7-9-10-1-aa`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCN          CLLI         BEI ELEI   ALIASA
ALIASI        DMN
   7-9-10-1-aa   ----------- no  ---    210-090-100
1-75-6        SS7

   SPCA          NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   13-2-12-0-aa no            none   off   none      no     no    none

Destination table is (17 of 2000) 1% full
```

```
Alias table is (8 of 8000) 1% full
RTRV-DSTN: MASP A - COMPLTD
```

2. Display the route configuration of the 14-bit ITU national point code specified in 1, by entering the `rtrv-rte` command with the `dpcn` parameter.

   For this example, enter this command.

   `rtrv-rte:dpcn=7-9-10-1-aa`

   This is an example of the possible output.

```
rlghncxa03w 07-05-17 16:02:05 GMT  EAGLE5 37.0.0
   DPCN             ALIASA         ALIASI  LSN        RC    APC
   7-9-10-1-aa      210-090-100    1-75-6  ls04       10    10-4-15-1-aa
                                           ls02       20    12-11-2-0-aa
                                           ls03       30    8-1-15-2-aa
                                               RTX:No  CLLI=ls04clli
```

3. Go to the Removing a Destination Point Code procedure and add the duplicate ITU national point code with the new group code.

   For this example, the new point code is `7-9-10-1-de`.

4. Go to the Removing a Destination Point Code procedure and remove the 14-bit ITU national point code with the old group code, specified is 1 and 2.

   This procedure will also remove the route to the point code with the old group code, the linkset used by this route, and the signaling links in that linkset. Record the configuration of the signaling links in the linkset. This information will be used to restore these signaling links in 6.

   > **Note:**
   >
   > If the DPC specified in 2 is not the adjacent point code of a linkset, shown in the `APCN` field of the `rtrv-rte` output, continue the procedure with 7.bof 7.

5. Perform the Adding an SS7 Linkset procedure to add a new linkset to the database containing the 14-bit ITU national point code with the new group code specified in 3 as the APC of the linkset.

6. Perform the Adding an SS7 Signaling Link procedure to dd the signaling links that were removed by the Removing a Destination Point Code procedure in step 4 and specifying the linkset name of the linkset that was added in 5.

7. If the DPC specified in 2 is the adjacent point code of a linkset and a new linkset was created in 5, then perform 7.a. If the DPC specified in 2 is not the adjacent point code of a linkset, then perform 7.b. Do not perform 7.a and 7.b.

   a. Perform one of the “Adding a **Route**” procedures in Chapter 3 to add the route to the 14-bit ITU national point code with the new group code specifying the name of the linkset created in step 5 and the 14-bit ITU national point code with the new group code from 3.

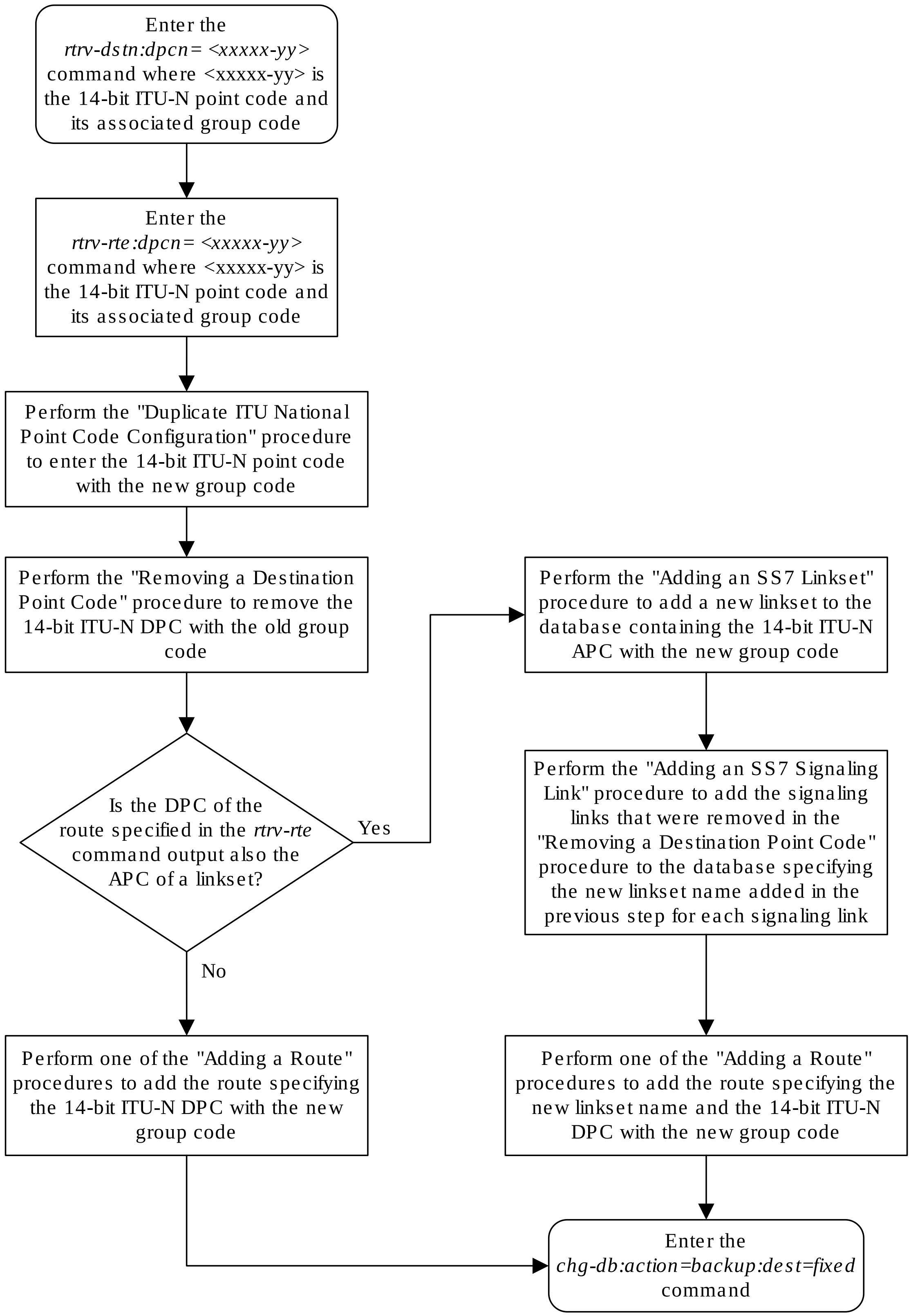
   b. Perform one of the “Adding a Route” procedures in Chapter 3 to add the route to the 14-bit ITU national point code with the new group code specifying the 14-bit ITU national point code with the new group code from 3.

8. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 2-33   Changing the Group Code Assigned to a 14-Bit ITU National Point Code



3
SS7 Configuration

Chapter 3, SS7 Configuration, describes the procedures necessary to configure the EAGLE 5 ISS to support the SS7 network.

3.1 Introduction

This chapter contains the procedures necessary to configure the **EAGLE** to support the **SS7** network. These items are configured to support the **SS7** network.

- Linksets, including linksets for these features:
  - **MTP** restart
  - 5-Bit to 8-Bit **SLS** conversion
  - **ITUSLS** enhancement
  - Configuring the option for determining how the **EAGLE** routes messages over restricted linksets and routes - the restricted linkset option.
  - Configuring the options for determining how the **EAGLE** handles **TFC** messages from **ITU**-I and **ITU**-N networks.
- Signaling links
- Routes
- Level 2 timers
- Level 3 timers
- Signaling link test messages
- The rate that **TFA** and **TFP** messages are sent
- Circular route detection
- The frequency that signaling-route-set-test (**RST**) messages are sent for lower priority routes
- Remote loopback points for the link fault sectionalization feature
- Options for the **TDM** Global Timing Interface
- Changing the **high-capacity card** temperature alarm thresholds.

3.2 Enabling the Large System # Links Controlled Feature

This procedure is used to enable the Large System # Links controlled feature using the feature's part number and a feature access key.

The feature access key for the Large System # Links controlled feature is based on the feature's part number and the serial number of the **EAGLE**, making the feature access key site-specific.

This feature allows the **EAGLE** to contain a maximum of either 1500, 2000, or 2800 signaling links.

The `enable-ctrl-feat` command enables the controlled feature by inputting the controlled feature's access key and the controlled feature's part number with these parameters:

`:fak` – The feature access key provided by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive.

`:partnum` – The Oracle-issued part number associated with the signaling link quantity being enabled:

- 893005901 for the 1500 signaling link quantity
- 893005910 for the 2000 signaling link quantity.
- 893005911 for the 2800 signaling link quantity.

The `enable-ctrl-feat` command requires that the database contain a valid serial number for the **EAGLE**, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

This feature cannot be temporarily enabled (with the temporary feature access key).

Once this feature is enabled with the `enable-ctrl-feat` command, the feature is also activated. The `chg-ctrl-feat` command is not necessary to activate the feature.

This feature cannot be turned off with the `chg-ctrl-feat` command and the `status=off` parameter.

Hardware Supported for Signaling Link Quantities Greater than 2000

This hardware is the only hardware that is supported for an EAGLE containing 2001 to 2800 signaling links.

- **HC-MIM**
- **E5-E1/T1**
- **E5-ATM**
- **E5-SM4G**
- **E5-ENET**
- E5-based control cards
- **E5-STC** card for the EAGLE 5 Integrated Monitoring Support feature

To increase the signaling link quantity to more than 2000 signaling links, HIPR2 cards must be installed into card locations 9 and 10 in each shelf in the **EAGLE**. Enter the `rept-stat-gpl:gpl=hipr2` command to verify whether or not **HIPR2** cards are installed in the EAGLE shelves.

1. Display the status of the Large System # Links controlled feature by entering the `rtrv-ctrl-feat` command.

   The following is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      400000
XMAP Table Expansion      893007710  off     ----
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the `rtrv-ctrl-feat` output shows that the controlled feature is enabled for the desired quantity or for a quantity that is greater than the desired quantity, no further action is necessary. This procedure does not need to be performed.

   If the `rtrv-ctrl-feat` output in 1 shows any controlled features, or if the Large System # Links controlled feature is enabled for a quantity that is less than the desired quantity, continue the procedure by performing one of these steps.

   - If the enabled quantity will be 1500, continue the procedure with 8.
   - If the enabled quantity will be 2000 or 2800, continue the procedure with 5.

> **Note:**
>
> If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
Command Completed
```

   If the serial number is correct and locked, continue the procedure by performing one of these steps.

   - If the enabled quantity will be 1500, continue the procedure with 8.
   - If the enabled quantity will be 2000 or 2800, continue the procedure with 6.

   If the serial number is correct but not locked, continue the procedure with 5.

   If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
System serial number = nt00001231
```

```
System serial number is not locked.

rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
Command Completed
```

If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

   Continue the procedure by performing one of these steps.

   - If the enabled quantity will be 1500, continue the procedure with 8.
   - If the enabled quantity will be 2000 or 2800, continue the procedure with 6.

6. Verify that HIPR2 cards are installed in card locations 9 and 10 in each shelf of the EAGLE. Enter this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-01 11:40:26 GMT  EAGLE5 41.1.0
GPL        CARD      RUNNING           APPROVED      TRIAL
HIPR2      1109      126-002-000       126-002-000   126-003-000
HIPR2      1110      126-002-000       126-002-000   126-003-000
HIPR2      1209      126-002-000       126-002-000   126-003-000
HIPR2      1210      126-002-000       126-002-000   126-003-000
HIPR2      1309      126-002-000       126-002-000   126-003-000
HIPR2      1310      126-002-000       126-002-000   126-003-000
HIPR2      2109      126-002-000       126-002-000   126-003-000
HIPR2      2110      126-002-000       126-002-000   126-003-000
Command Completed
```

7. Before the 2000 or 2800 signaling link quantity can be enabled, make sure the EAGLE is configured with the hardware shown in the "Hardware Supported for Signaling Link Quantities Greater than 2000" section.

   If hardware other than the hardware shown in the "Hardware Supported for Signaling Link Quantities Greater than 2000" section is installed and provisioned, contact the Customer Care Center before enabling the 2000 or 2800 signaling link quantity. Refer to My Oracle Support (MOS) for the contact information.

8. Enable the Large System # Links controlled feature for the desired quantity with the `enable-ctrl-feat` command specifying the part number corresponding to the new quantity of signaling links and the feature access key.

   To increase the number of signaling links the EAGLE can contain to 1500, enter this command.

   ```
   enable-ctrl-feat:partnum=893005901:fak=<feature access key>
   ```

   To increase the number of signaling links the EAGLE can contain to 2000, enter this command.

   ```
   enable-ctrl-feat:partnum=893005910:fak=<feature access key>
   ```

   To increase the number of signaling links the EAGLE can contain to 2800, enter this command.

   ```
   enable-ctrl-feat:partnum=893005911:fak=<feature access key>
   ```

   > **Note:**
   >
   > A temporary feature access key cannot be specified to enable this feature.

   > **Note:**
   >
   > The values for the feature access key (the`fak` parameter) are provided by Oracle. If you do not have the feature access key for the feature you wish to enable, contact your Sales Representative or Account Representative.

   When the `enable-crtl-feat` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

9. Verify the changes by entering the `rtrv-ctrl-feat`command with the part number specified in 8.

   If the 1500 signaling link quantity was enabled in 8, enter this command.

   ```
   rtrv-ctrl-feat:partnum=893005901
   ```

   The following is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Large System # Links      893005901  on      1500

   The following features have been temporarily enabled:
   ```

```
Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the 2000 signaling link quantity was enabled in 8, enter this command.

`rtrv-ctrl-feat:partnum=893005910`

The following is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Large System # Links      893005910  on      2000

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the 2800 signaling link quantity was enabled in 8, enter this command.

`rtrv-ctrl-feat:partnum=893005911`

The following is an example of the possible output.

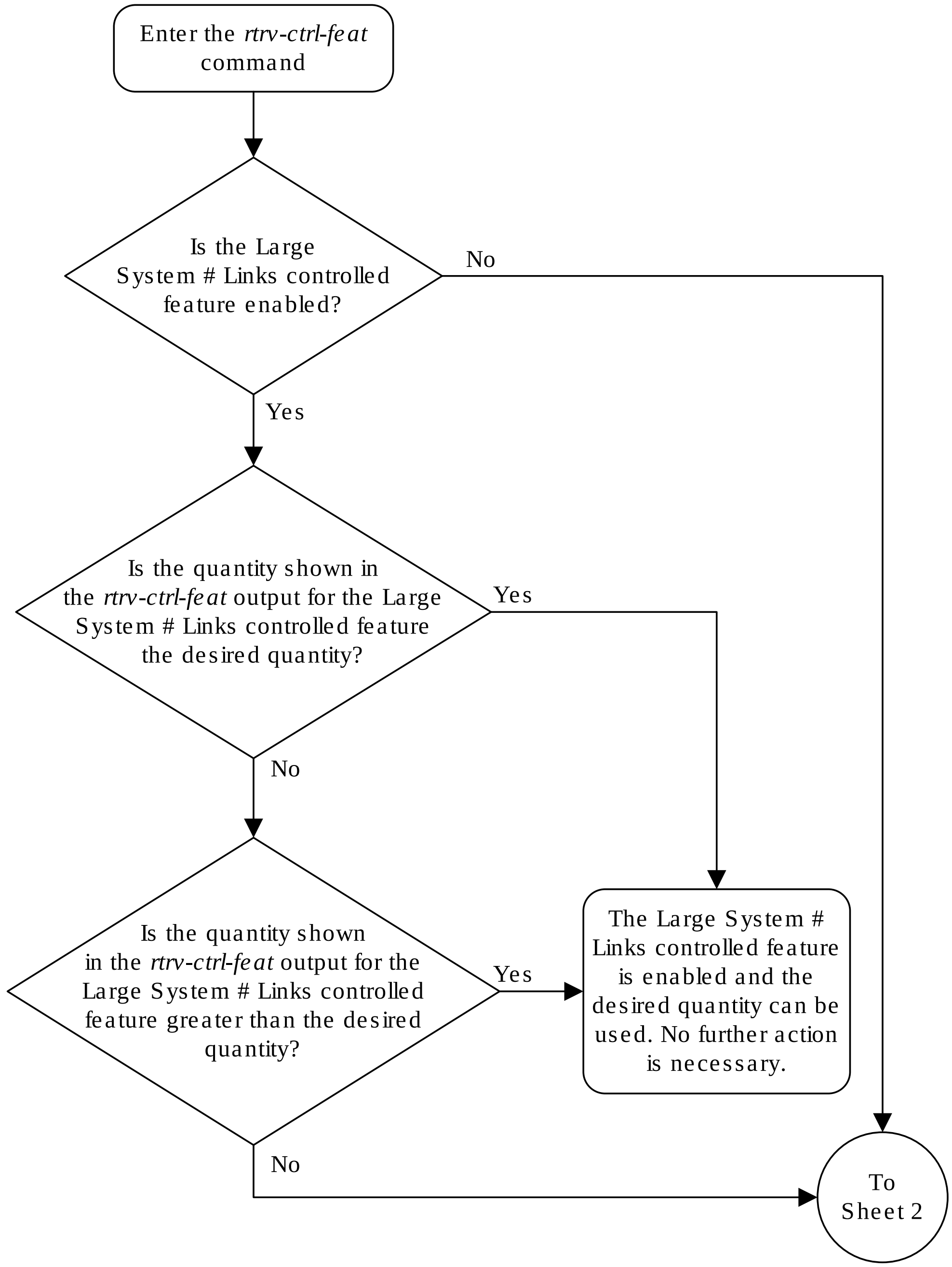
```
rlghncxa03w 09-07-28 21:15:37 GMT EAGLE5 41.1.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Large System # Links      893005911  on      2800

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:
```

```
Feature Name              Partnum
Zero entries found.
```

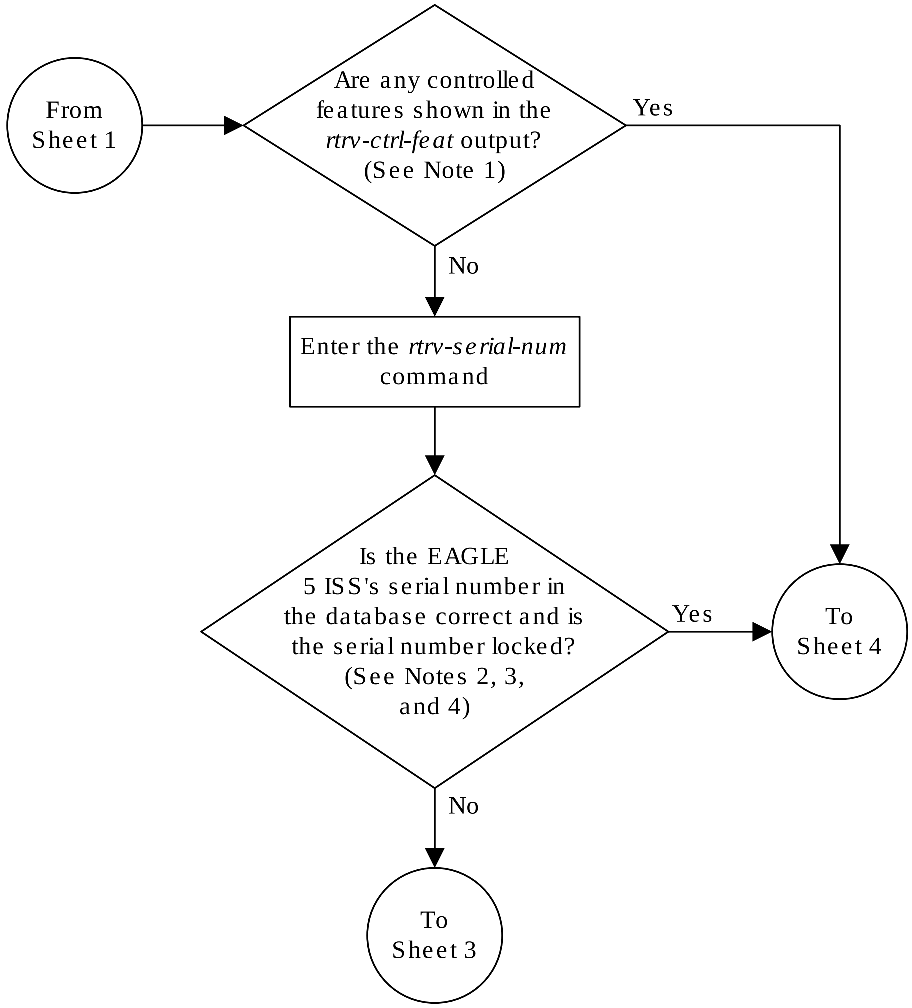
10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```


Enter the *rtrv-ctrl-feat* command
Is the Large System # Links controlled feature enabled?
No
Yes
Is the quantity shown in the *rtrv-ctrl-feat* output for the Large System # Links controlled feature the desired quantity?
Yes
No
Is the quantity shown in the *rtrv-ctrl-feat* output for the Large System # Links controlled feature greater than the desired quantity?
Yes
The Large System # Links controlled feature is enabled and the desired quantity can be used. No further action is necessary.
No
To Sheet 2

Sheet 1 of 6



Notes:

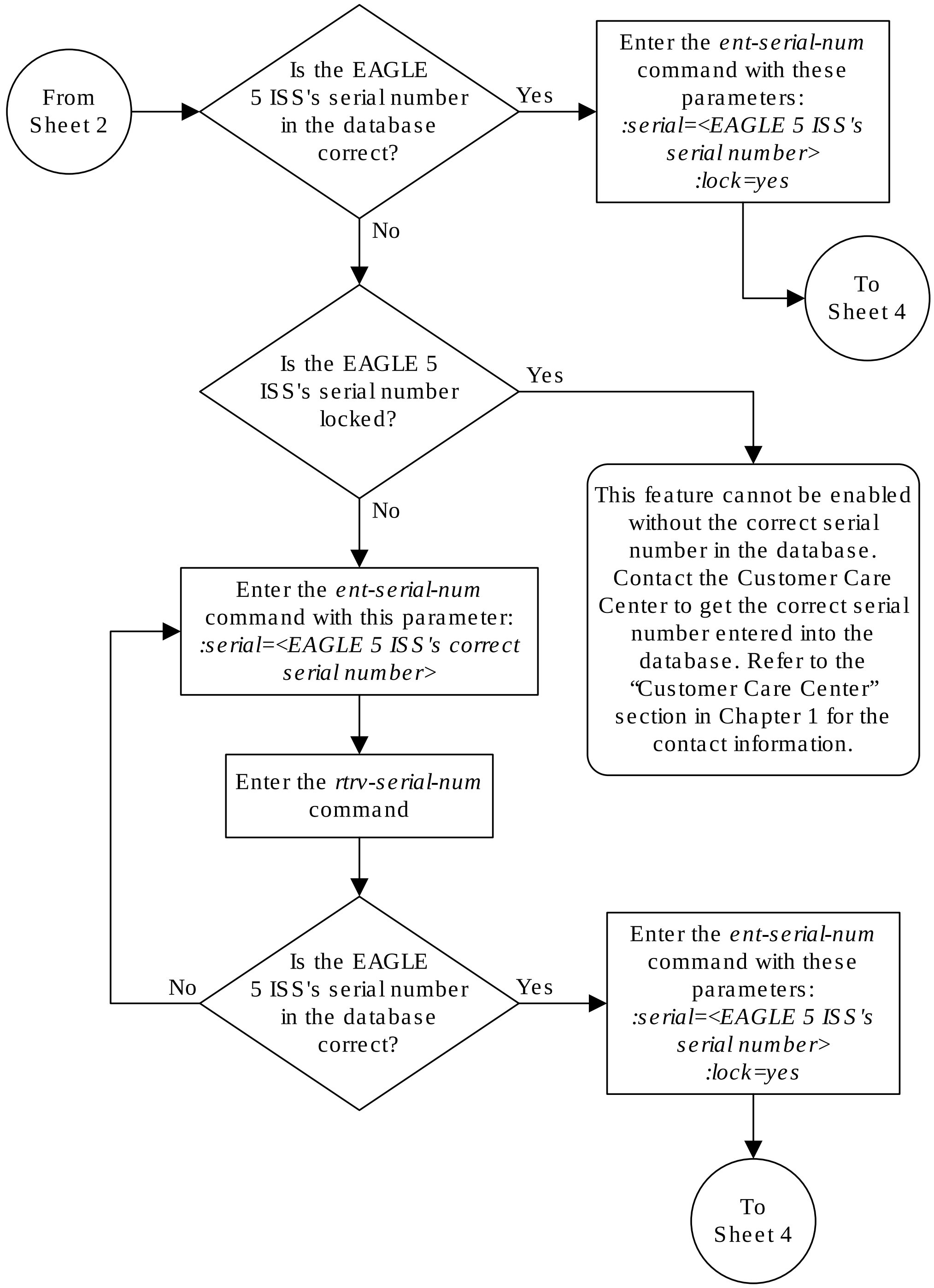
1. If the *rtrv-ctrl-feat* output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the answer to this question is no and the Eagle 5 ISS's serial number must be verified. This is the default entry for the *rtrv-ctrl-feat* output. This entry is shown whether or not the Eagle 5 ISS's serial number is in the database.

2. If the serial number is locked, it cannot be changed.

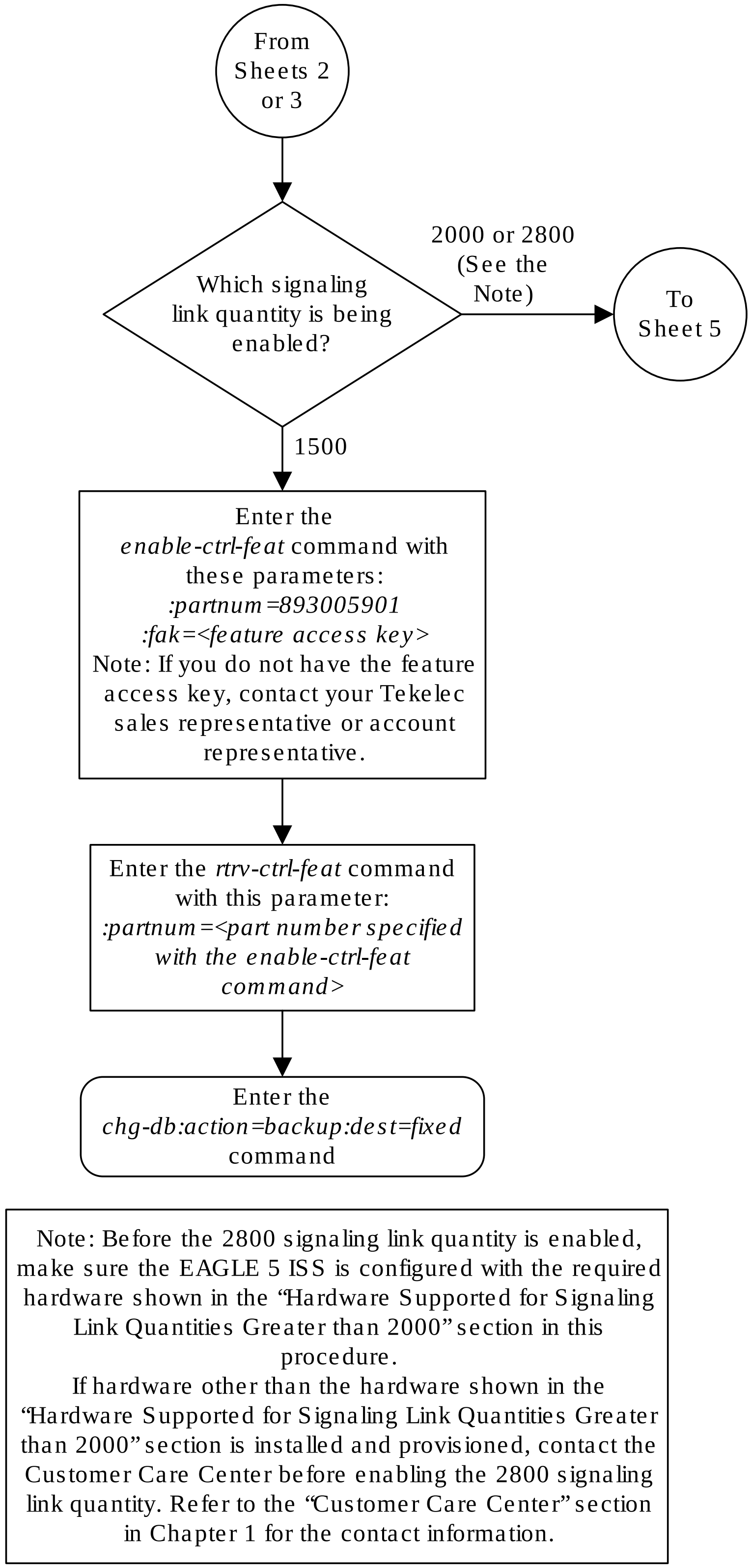
3. If the serial number is not locked, the controlled feature cannot be enabled.

4. The serial number can be found on a label affixed to the control shelf (shelf 1100).

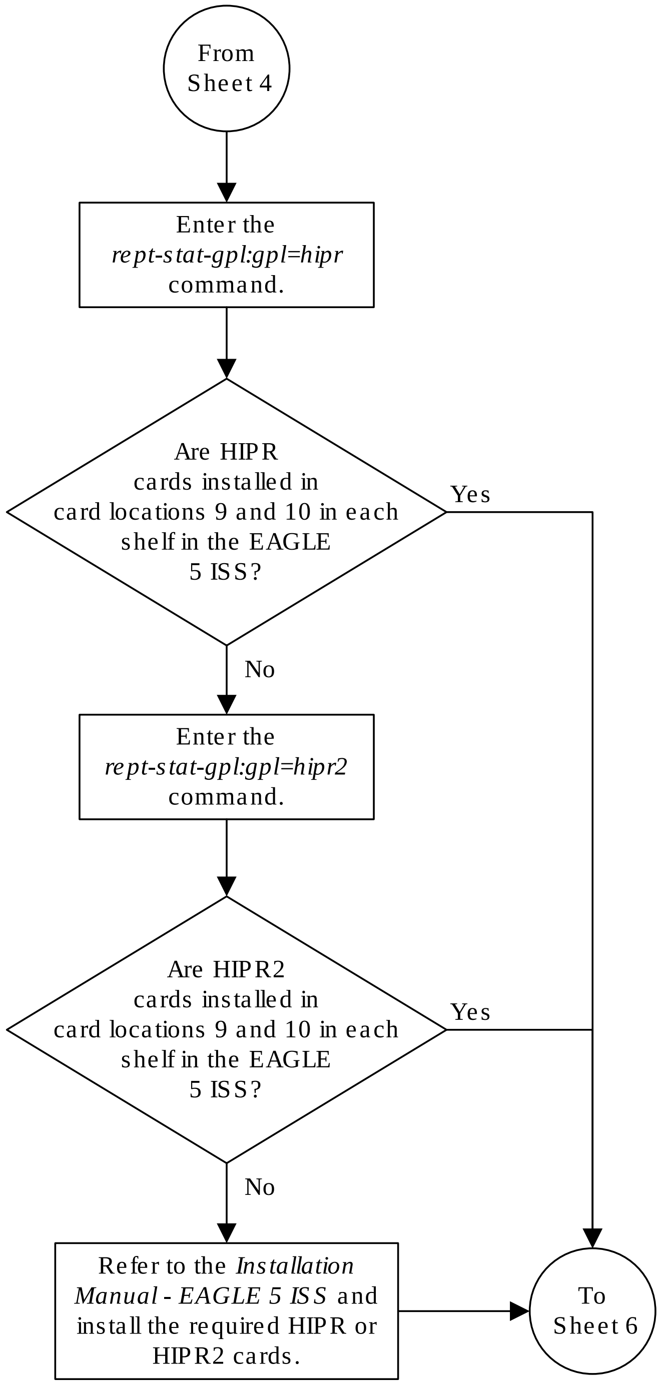
Sheet 2 of 6


From Sheet 2
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
Enter the ent-serial-num command with these parameters:
:serial=<EAGLE 5 ISS's serial number>
:lock=yes
To Sheet 4
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the “Customer Care Center” section in Chapter 1 for the contact information.
No
Enter the ent-serial-num command with this parameter:
:serial=<EAGLE 5 ISS's correct serial number>
Enter the rtrv-serial-num command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the ent-serial-num command with these parameters:
:serial=<EAGLE 5 ISS's serial number>
:lock=yes
To Sheet 4

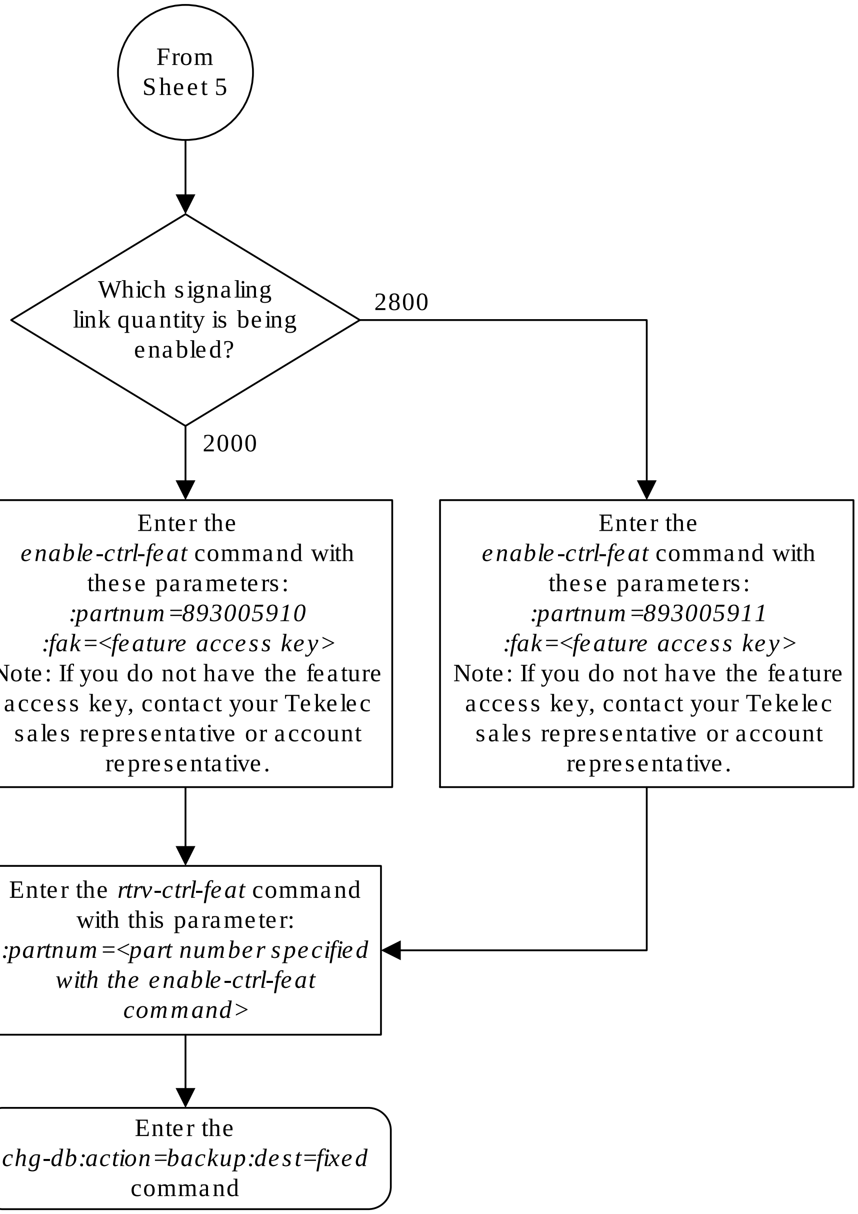
Sheet 3 of 6


From Sheets 2 or 3
Which signaling link quantity is being enabled?
2000 or 2800 (See the Note)
To Sheet 5
1500
Enter the *enable-ctrl-feat* command with these parameters:
:partnum=893005901
:fak=<feature access key>
Note: If you do not have the feature access key, contact your Tekelec sales representative or account representative.
Enter the *rtrv-ctrl-feat* command with this parameter:
:partnum=<part number specified with the enable-ctrl-feat command>
Enter the *chg-db:action=backup:dest=fixed* command
Note: Before the 2800 signaling link quantity is enabled, make sure the EAGLE 5 ISS is configured with the required hardware shown in the "Hardware Supported for Signaling Link Quantities Greater than 2000" section in this procedure.
If hardware other than the hardware shown in the "Hardware Supported for Signaling Link Quantities Greater than 2000" section is installed and provisioned, contact the Customer Care Center before enabling the 2800 signaling link quantity. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.

Sheet 4 of 6


From Sheet 4
Enter the *rept-stat-gpl:gpl=hipr* command.
Are HIPR cards installed in card locations 9 and 10 in each shelf in the EAGLE 5 ISS?
Yes
No
Enter the *rept-stat-gpl:gpl=hipr2* command.
Are HIPR2 cards installed in card locations 9 and 10 in each shelf in the EAGLE 5 ISS?
Yes
No
Refer to the *Installation Manual - EAGLE 5 ISS* and install the required HIPR or HIPR2 cards.
To Sheet 6

Sheet 5 of 6


From Sheet 5
Which signaling link quantity is being enabled?
2800
2000
Enter the *enable-ctrl-feat* command with these parameters:
:partnum=893005910
:fak=<feature access key>
Note: If you do not have the feature access key, contact your Tekelec sales representative or account representative.
Enter the *enable-ctrl-feat* command with these parameters:
:partnum=893005911
:fak=<feature access key>
Note: If you do not have the feature access key, contact your Tekelec sales representative or account representative.
Enter the *rtrv-ctrl-feat* command with this parameter:
:partnum=<part number specified with the enable-ctrl-feat command>
Enter the *chg-db:action=backup:dest=fixed* command

Sheet 6 of 6

3.3 Adding an SS7 Linkset

This procedure is used to add **SS7** linksets to the EAGLE using the `ent-ls` command and the following parameters shown in Table 3-1.

Table 3-1 Linkset Parameters

lsn	apc/apca/apci/ apcn/apcn24	ppc/ppca/ppci/ ppcn/ppcn24	spc/spca/spci/ spcn/spcn24	apcntype
lst	clli	sltset	l3tset	scrn
gwsa	gwsm	gwsd	bei	nis
itutfr	mtprse	slsci	asl8	slsrsb
slsocbit	multgc	gttmode	randsls	cgttmode
islsrsb				

The `ent-ls` command contains other optional parameters that are not used this procedure. These parameters are discussed in more detail in *Commands User's Guide* or in these sections.

- The "Configuring a Linkset for the GSM MAP Screening Feature" procedure in *Database Administration - Features User's Guide*.
- These procedures in *Database Administration - IP7 User's Guide*.
  - Configuring an IPGWx Linkset
  - Adding a Mate IPGWx Linkset to another IPGWx Linkset
  - Adding an IPSG M3UA Linkset
  - Adding an IPSG M2PA Linkset

`:lsn` – The name of the linkset. The linkset name can contain up to 10 characters, with the first character being a letter. However, the **SEAS** interface supports only eight characters. If this linkset is displayed on the **SEAS** interface and the linkset name contains more than eight characters, only the first eight characters in the linkset name are shown. If this linkset name contains more than eight characters, and is specified with the linkset commands on the **SEAS** interface, only the first eight characters can be specified.

`:apc/apca/apci/apcn/apcn24` – Adjacent point code – the point code identifying the node that is next to the **EAGLE**. The adjacent point code can be one of the following types of point codes:

- :`apc`/`apca` – **ANSI** point code
- :`apci` – **ITU**-I point code, **ITU**-I spare point code
- :`apcn` – 14-bit **ITU**-N point code, 14-bit **ITU**-N spare point code
- :`apcn24` – 24-bit **ITU**-N point code

`:ppc/ppca/ppci/ppcn/ppcn24` – Proxy point code used for proxy linksets. Proxy point codes can be used only if a quantity of proxy point codes (shown in the `rtrv-ctrl-feat` output) is enabled. The proxy point code can be one of the following types of point codes:

- :`ppc`/`ppca` – **ANSI** point code
- :`ppci` – **ITU**-I point code, **ITU**-I spare point code
- :`ppcn` – 14-bit **ITU**-N point code, 14-bit **ITU**-N spare point code
- :`ppcn24` – 24-bit **ITU**-N point code

`:spc/spca/spci/spcn/spcn24` – Secondary point code used for multiple linksets that have the same APC. Secondary point codes can be used only if the Multiple Linksets to Single Adjacent PC feature is enabled and turned on (shown in the `rtrv-ctrl-feat` output. The secondary point code can be one of the following types of point codes:

- :`spc`/`spca` – **ANSI** point code
- :`spci` – **ITU**-I point code, **ITU**-I spare point code
- :`spcn` – 14-bit **ITU**-N point code, 14-bit **ITU**-N spare point code
- :`spcn24` – 24-bit **ITU**-N point code

> **Note:**
>
> Refer to Point Code Formats for a definition of the point code types that are used on the **EAGLE** and for a definition of the different formats that can be used for **ITU** national point codes. Private point codes can be assigned only to **IPGWx** linksets. The procedures for configuring **IPGWx** linksets are in *Database Administration - IP7 User's Guide*.

`:apcntype` – Specifies whether or not the linkset containing either a 14-bit **ITU**-N adjacent point code or a 24-bit **ITU**-N adjacent point code is being used in China (`apcntype=itunchina`) or in countries other than China (`apcntype=itun`). Signaling links in linksets with the `apcntype=itunchina` parameter are handled according to the specifications in *YD/N 068-1997, Technical Specification of National No.7 Signaling System - Message Transfer Part (MTP)*. Signaling links in linksets with the `apcntype=itun` parameter are handled according to the specifications in *ITU-T Q.2210 (07/96), Switching and Signaling, Broadband ISDN- Signaling Network Protocols*. The default value for the `apcntype` parameter is `itun`.

Linksets shown in section of the `rtrv-ls` output with the `LSN (CHINA)` column (and with either the `APCN` or `APCN24` column) have the `acpntype=itunchina` parameter assigned to them.
Linksets shown in section of the `rtrv-ls` output with the `LSN` column (and with either the `APCN` or `APCN24` column) have the `acpntype=itun` parameter assigned to them.

`:lst` – The linkset type of the specified linkset

`:clli` – The **Common Language Location Identifier** assigned to this point code. The value of the `clli` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command.

`:sltset` – The signaling link test message record to be associated with the linkset.

`:l3tset` – The level 3 timer set table. This parameter identifies which level three timer set is to be assigned to this linkset.

`:scrn` – The name of the screenset to be assigned to this linkset if gateway screening is to be used.

`:gwsa` – Gateway screening action determines whether gateway screening (**GWS**) is on or off for the specified link set.

`:gwsm` – Gateway screening messaging is used to turn on or off the display of messages generated for each screened message. When an **MSU** is rejected by gateway screening, a message is output to alert personnel of the event.

`:gwsd` – Gateway screening **MSU** discard is used to turn on or off the discarding of **MSUs** that bypass the gateway screening function due to load shedding. Also use this parameter with the redirect function; **MSUs** that cannot be screened are discarded if you specify `gwsd=on`.

`:bei` – The broadcast exception indicator. This parameter indicates whether **TFP** (transfer prohibited) messages are allowed to be broadcast on the linkset. The `yes` parameter means **TFPs** are not broadcast. The `no` parameter means **TFPs** are broadcast.

`:nis` – specifies whether the National Spare for Network Indicator feature is on or off for the specific linkset. This feature allows the linkset to use the national spare value (3) for the network indicator code field in the service information octet (**SIO**) of the **MSU** for **ANSI** linksets and **ITU** national linksets (linksets containing either 14-bit **ITU**-N point codes or 24-bit **ITU**-N point codes). This parameter cannot be specified for **ITU** international linksets. The default value for the `nis` parameter is `off`.

For **MSUs** on incoming linksets, only those **MSUs** having the network indicator code values shown in Table 3-2 are allowed into the **EAGLE**.

For **MSUs** on outgoing linksets, the network indicator code value in the **MSU** is changed to either the national network indicator code value (2) or the national spare network indicator code value (3). If the `nis` parameter is set to `off`, the network indicator code value is set to 2.

These actions are summarized in Table 3-2.

The actions described for this parameter apply only if the **ITU** National and International **Spare Point Code** Support feature is not enabled.

If the **ITU** National and International **Spare Point Code** Support feature is enabled, the `nis` parameter value is ignored for **ITU**-I and 14-bit **ITU**-N linksets. All the network indicator values are permitted on **ITU**-I and **ITU**-N linksets, and the network indicator value for transmission is based on the International/National and Spare/Non-Spare status of the **DPC** of the message.

Having the **ITU** National and International **Spare Point Code** Support feature enabled has no effect on **ANSI** and 24-bit **ITU**-N linksets. The `nis` parameter value determines which incoming network indicator spare bit values to permit, and what network indicator spare bit value should be transmitted.

Table 3-2 Actions of the National Spare for Network Indicator Feature

Linkset Type	Feature Disabled	Feature Enabled
Incoming **ANSI** Linkset	**MSUs** containing the national network indicator code (2) are allowed into the **EAGLE**.	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • National Network Indicator Code (2) • National Spare Network Indicator Code (3)
Outgoing **ANSI** Linkset	The network indicator code value in the **MSU** is set to the national network indicator code (2).	The network indicator code value in the **MSU** is set to the national spare network indicator code (3).
Incoming **ITU** National Linkset	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • International Network Indicator Code (0) • National Network Indicator Code (2)	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • International Network Indicator Code (0) • National Network Indicator Code (2) • National Spare Network Indicator Code (3)
Outgoing **ITU** National Linkset	The network indicator code value in the **MSU** is set to the national network indicator code (2).	The network indicator code value in the **MSU** is set to the national spare network indicator code (3).

`:itutfr` – specifies whether or not **ITUTFR** (transfer restricted) procedures are being used on the linkset. This parameter applies only to linksets with **ITU** national adjacent point codes (linksets containing either 14-bit **ITU**-N point codes or 24-bit **ITU**-N point codes) and can be specified only for linksets with **ITU** national adjacent point codes. **TFR** procedures are used to redirect traffic away from a node that is having problems routing traffic to a destination. When a node determines that a destination is restricted, the node sends a **TFR** message informing the adjacent nodes about the destination's status. When a destination is restricted, the node should not be used to route messages to the destination even though it still has limited capability to do so. The values for this parameter are either `on` (**ITUTFR** procedures are enabled) or `off` (**ITUTFR** procedures are disabled). For more information about using the `itutfr` parameter, refer to ITU TFR Procedures.

`:mtprse` – shows if the node adjacent to the **EAGLE** is equipped with the **MTP** restart capability. The `mtprse=yes` parameter can only be specified if the **MTP** restart feature is turned on for **ANSI** linksets (`MTPRS = on` in the `rtrv-feat` command output), or if the **ITUMTP** restart is on for **ITU** linksets (`ITUMTPRS=on` in the `rtrv-feat` command output). If the **MTP** restart feature is not turned on, the value of the `mtprse` parameter defaults to `no`. The value of the `mtprse` parameter value is not dependent on the value of the `mtprsi` parameter (the **MTP** restart indicator) in the `chg-stpopts` command. The value of the `mtprse` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command. For more information on MTP Restart feature, refer to Configuring the MTP Restart Feature.

`:slsci` – indicates whether the 5-bit to 8-bit **SLS** conversion feature is used to select signaling links for outgoing messages on the specified link set. If the `slsci=yes` parameter is specified, the **EAGLE** replaces any 5-bit **SLS** values contained in received messages with a random 8-bit value before they are used by the **EAGLE** to select the outgoing signaling link in that linkset. The 5-bit to 8-bit **SLS** conversion is also controlled by the `slscnv` parameter of the `chg-stpopts` command. The `slscnv` parameter of the `chg-stpopts` command has three values: `on`, `off`, and `perls`. The `slsci` parameter can only be specified for linksets with **ANSI SS7** adjacent point codes.

`:asl8` – shows if the node adjacent to the **EAGLE** is sending **MSUs** with 8-bit **SLSs**. If the `asl8=yes` parameter is specified with the `lst=a` parameter (a linkset containing access signaling links), this indicates that the originator of the **MSUs** is generating 8-bit **SLSs**. For other linkset types, the `asl8=yes` parameter indicates that the adjacent node is converting 5-bit **SLSs** to 8-bit **SLSs**. The **SLS** in **MSUs** received by the **EAGLE** on a linkset that has the `asl8=yes` parameter assigned to it will not be converted. These **MSUs** are assumed to contain 8-bit **SLSs**. If the `asl8=no` parameter is specified for the linkset, the **SLS** will be converted to an 8-bit **SLS**. The `asl8` parameter can only be specified for linksets with **ANSI SS7** adjacent point codes. The value of the `asl8` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command. For more information on the `slsci` and `asl8` parameters and 5-bit to 8-bit SLS conversion, refer to Configuring the 5-Bit to 8-Bit SLS Conversion Feature.

`:slsrsb` – selects which bit (1 - 4) of the **SLS** field to use as the least significant bit for signaling link selection in the link set for all messages on outgoing ITU linksets.

`:islsrsb` – selects which bit of the **SLS** field, 1 - 5 for an ANSI linkset or 1 - 4 for an ITU linkset, to use as the least significant bit for signaling link selection in the link set for all messages on ANSI and ITU linksets on incoming linksets. The `:islsrsb` value for an ANSI linkset can be 1 - 8, but can be only 1 - 5 when adding an ANSI linkset. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter, the `rsls8` value for the linkset must be `yes`. Perform these procedures after adding the linkset.

- Configuring the RSLS8 Value for ANSI Linksets – to change the `rsls8` value for the linkset to `yes`.
- Changing an SS7 Linkset – to change the `islsrsb` value.

`:slsocbit` – selects which bit (5 - 16) of the **SLS** field to use as the most significant bit for signaling link selection in the link set for all **ITU** messages.

> **Note:**
>
> For more information on the `slsrsb`, `islsrsb`, and `slsocbit` parameters and **ITUSLS** enhancement, refer to ITU SLS Enhancement.

`:multgc` – specifies whether multiple group codes (for 14-bit **ITU**-N point codes) are supported for the linkset. When this parameter value is `yes`, secondary adjacent point codes whose group codes are different from the adjacent point code of the linkset can be assigned to the linkset. If the parameter value is `no`, the group code of the secondary adjacent point code must be the same as the group code of the linkset's adjacent point code. For more information on secondary adjacent point codes, refer to Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC).

This parameter only applies to linksets whose adjacent point codes are either **ITU** international point codes or **ITU** national point codes. All the signaling links in this linkset must be assigned to cards running the **IPLIMI** application. For more information on assigning signaling links to cards running the **IPLIMI** application, go

to the “Adding an **IPSignaling Link**” procedure in the *Database Administration - IP7 User's Guide*.
The **ITU** duplicate point code feature must be on before this parameter can be specified. Verify this with the `rtrv-feat` command. If the **ITU** duplicate point code feature is turned on, the `ITUDUPPC` field should be set to `on`. If the **ITU** duplicate point code feature is not turned on, enter the `chg-feat:ituduppc=on` command.

> **Note:**
>
> Once the **ITU** duplicate point code feature is turned on with the `chg-feat` command, it cannot be turned off.
> The **ITU** duplicate point code feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the **ITU** duplicate point code feature, contact your Oracle Sales Representative or Account Representative.

`:gttmode` – The **GTT** mode assigned to the linkset when performing global title translation on the specified linkset. The values for this parameter are:

- `sysdflt` – the value of the `dfltgttmode` parameter shown in the `rtrv-sccpopts` command output.
- `cd` - **CdPA** GTT only
- `cg` - **CgPA** GTT only
- `acdcd` - Advanced **CdPA** GTT, **CdPA** GTT
- `acdcgcd` - Advanced **CdPA** GTT, **CgPA** GTT, **CdPA** GTT
- `acdcdcg` - Advanced **CdPA** GTT, **CdPA** GTT, **CgPA** GTT
- `cgacdcd` - **CgPA**GTT, Advanced **CdPA** GTT, **CdPA** GTT
- `cgcd` - **CgPA**GTT, **CdPA** GTT
- `cdcg` - **CdPA** GTT, **CgPA** GTT
- `fcd` - Flexible Linkset Optional Based Routing (**FLOBR**) CdPA only
- `fcg` - FLOBR CgPA only
- `fcdfcg` - FLOBR CdPA, FLOBR CgPA
- `fcgfcd` - FLOBR CgPA, FLOBR CdPA

The default value for this parameter is `sysdflt`. For more information on using the `gttmode` parameter, refer to the Origin-Based SCCP Routing Feature section or the Flexible Linkset Optional Based Routing section in *Database Administration - GTT User's Guide*.
To use the values `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, or `cgcd` for the `gttmode` parameter, the Origin-Based SCCP Routing feature must be enabled and turned on.
To use the values `fcd`, `fcg`, `fcdfcg`, or `fcgfcd` for the `gttmode` parameter, the Flexible Linkset Optional Based Routing feature must be enabled and turned on.

`:randsls` – The random **SLS** value assigned to the linkset. This parameter is used to apply random **SLS** generation for the specified linkset. The `randsls` parameter has three values:

- off – Random **SLS** generation is not applied to the specified linkset.
- class0 – Random **SLS** generation is applied to only Class 0 **SCCP** messages on either incoming ANSI or outgoing ITU linksets.
- all – Random **SLS** generation is applied to both Class 0 and Class 1 **SCCP** messages on outgoing ITU linksets, or to Class 0 SCCP messages and ISUP messages on ANSI linksets.

For more information about random **SLS** generation on a specific linkset, refer to Per-Linkset Random SLS.

:cggtmod - The calling party GT modification indicator. This parameter specifies whether or not calling party global title modification is required. The values for this parameter are yes (calling party global title modification is required) or no (calling party global title modification is not required). The default value for the cggtmod parameter is no. This parameter can be specified only if the AMGTT or AMGTT CgPA Upgrade feature is enabled. Enter the rtrv-ctrl-feat command to verify that either the AMGTT or AMGTT CgPA Upgrade feature is enabled. If the AMGTT or AMGTT CgPA Upgrade feature is not enabled, perform the "Activating the Advanced GT Modification Feature" procedure in *Database Administration - GTT User's Guide* procedure to enable the required feature. For more information about the Advanced GT Modification feature, refer to the "Advanced GT Modification Feature" section in *Database Administration - GTT User's Guide*.

The linkset also contains the tfatcabmlq parameter, whose value is shown in the rtrv-ls:lsn=<linkset name> command. The tfatcabmlq parameter exists only in the chg-ls command and not the ent-ls command, because no links are assigned to the linkset when the linkset is first created with the ent-ls command. The default value for the tfatcabmlq parameter (tfatcabmlq=0) is entered for the linkset, and shown in the rtrv-ls output as 1, when a new linkset is added to the database.

The **EAGLE** can contain 1024 linksets, with a maximum of 255 of these linksets being gateway linksets. A gateway linkset is a linkset that contains routes to a different network.

The linkset to be added cannot be in the database. This can be verified in step 1 of this procedure.

The adjacent point code (**APC**) must be defined in the database, must be in the **SS7** domain and cannot match the point code or capability point code of the **EAGLE**. This can be verified in steps 2 and 3 of this procedure. The domain of the point code is shown in the DMN field in the output of the rtrv-dstn command (step 3). The point code of the **EAGLE** is shown in the PCA, PCN, PCN24, or PCI fields and the capability point code of the **EAGLE** are shown in the CPCA, CPCN, CPCN24, or CPCI fields in the output of the rtrv-sid command (step 2). The adjacent point code must be a full point code and cannot be a cluster point code or a network routing point code.

If the **APC** is not in the destination point code table, perform Adding a Destination Point Code and add the **APC** to the destination point code table.

The ent-ls command has a parameter, gwsd, that can allow the discarding of messages that should have gone through the gateway screening process, but did not. The gwsd parameter is only intended to be used with the **Database Transport Access** (**DTA**) feature. If you are not using the **DTA** feature, the gwsd parameter should not be specified or should be set to no (gwsd=no).

The gwsa, gwsm, and gwsd parameters can only be specified if the scrn parameter is specified. If the scrn parameter is specified, the gateway screening screen set name specified by this parameter must also be defined as a gateway screening screen set entity. This can be verified with the rtrv-scrset command.

> **Caution:**
>
> When **Gateway Screening** is in the screen test mode, as defined by the linkset parameters gwsa=off and gwsm=on, the gateway screening action in the gateway screening stop action set specified by the actname parameter of the gateway screening screen set at the end of the gateway screening process will be performed.

To help manage congestion on signaling links, the **EAGLE** starts the level 3 T31 timer whenever a signaling link goes into congestion level 1 or congestion level 2. The congestion level that is associated with the level 3 T31 timer is set using the chg-stpopts command with the mtpt31ctl parameter and is displayed with the MTPT31CTL field in the rtrv-stpopts command output. When the level 3 timer T31 and the chg-stpopts command are first introduced to the **EAGLE**, the system default value for the mtpt31ctl parameter of the chg-stpopts command is 1, for congestion level 1, and the system default value for the level 3 T31 timer is 60 seconds. To change the value of the level 3 T31 timer, perform Changing Level 3 Timers. To change value of the mtpt31ctl parameter, enter the either chg-stpopts:mtpt31ctl=1 or the chg-stpopts:mtpt31ctl=2 command, depending on the current value of the mtpt31ctl parameter.

To help prevent the signaling link in the linkset from oscillating in out of service, the **EAGLE** starts the level 3 T32 timer. When the **EAGLE** begins restoring an out of service signaling link, the **EAGLE** starts the level 3 T32 timer. If the signaling link fails again before the level 3 T32 expires, the **EAGLE** does not attempt to continue to bring the signaling link into service until the level 3 T32 timer expires. Once the level 3 T32 timer expires, the **EAGLE** attempts to restore the signaling link into service. When the level 3 timer T32 is first introduced to the **EAGLE**, the default value for the level 3 T32 timer is 60 seconds. To change the value of the level 3 T32 timer, perform Changing Level 3 Timers.

The word SEAS cannot be used as a value for the scrn parameter of the ent-ls command. The word SEAS is used in the rtrv-ls command output, in the SCRN field, to show gateway linksets created on the **SEAS** interface. A gateway linkset combines the functions of a gateway screening screen set and an **SS7** linkset specifying the gwsa=on and scrn parameters. Like a **EAGLE** gateway screening screen set, a gateway linkset defines the screening references that are to be used to screen the messages on the linkset. It also defines the linkset whose messages are to be screened. A gateway linkset can only be configured from a **SEAS** terminal and not from a **EAGLE** terminal.

If the clli parameter is specified with the ent-ls command, the value of the clli parameter must match the **CLLI** value of the adjacent point code of the linkset. The **CLLI** value of the adjacent point code is shown in the CLLI field of the rtrv-dstn command.

If the randsls parameter of the chg-stpopts command is set to either all or class0, a maximum of 16 links continues to be supported in a single linkset to a destination. However, it is now possible to have up to 32 links in a combined linkset to a destination, with a maximum of 16 links per linkset. The 32 links is a change from the current **EAGLE** maximum of only 16 links per combined linkset, which is due to **ITU** protocol restrictions. If more than 16 links are used in a combined linkset, the operator needs to be aware that a maximum of 16 links can be used by non-Random **SLS** traffic over the linkset. The non-Random **SLS** traffic continues to operate under the rules of the **ITU** protocol. For more information on the Random **SLS** Generation feature, perform Configuring the System for Random SLS Generation.

Canceling the `RTRV-LS` and `RTRV-DSTN` Commands

Because the `rtrv-ls` and `rtrv-dstn` commands used in this procedure can output information for a long period of time, the `rtrv-ls` and `rtrv-dstn` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` and `rtrv-dstn` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered, from another terminal other that the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                 L3T SLT              GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2           001-207-000   none 1   1   no  B   6    off off off
no    off
ls1305         001-005-000   none 1   1   no  A   1    off off off
no    off
ls1307         001-007-000   none 1   1   no  A   1    off off off
no    off
e1m1s1         001-001-003   none 1   1   no  A   7    off off off
no    off
e1m1s2         001-001-002   none 1   1   no  A   7    off off off
no    off

                                 L3T SLT              GWS GWS GWS
LSN            APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i          1-207-0       none 1   1   no  B   4    off off off
---   on
ls1315         0-015-0       none 1   1   no  A   1    off off off
---   off
```

```
ls1317        0-017-0       none 1   1   no  A   1    off off off ---   on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off ---
off

Link set table is (10 of 1024) 1% full.
```

If the APC of the new linkset will be an APC that is currently assigned to an existing linkset, continue the procedure with 5.

If the APC of the new linkset will not be an APC that is currently assigned to an existing linkset, continue the procedure with 2.

2. Display the point code and capability point code of the **EAGLE** by using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
   PCA             PCI           PCN                 CLLI
PCTYPE
   001-001-001     1-200-6       13482               rlghncxa03w       OTHER

   CPCA
   002-002-002       002-002-003       002-002-004       002-002-005
   002-002-006       002-002-007       002-002-008       002-002-009
   004-002-001       004-003-003       144-212-003

   CPCA (LNP)
   005-005-002        005-005-004      005-005-005

   CPCI
   1-001-1           1-001-2           1-001-3           1-001-4

   CPCN
   02091             02092             02094              02097
   02191             02192             11177
```

3. Display the point codes in the destination point code table by using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   001-002-003   ls04clli    yes --- ----------      --------------    SS7
   002-002-100   ls01clli    no  --- ---------       --------------    SS7
   002-007-008   ls06clli    yes --- ---------       --------------    SS7
   002-009-003   --------    no  --- ---------       --------------    SS7
   002-250-010   --------    no  --- ---------       --------------    SS7
   003-003-003   ls03clli    yes --- ---------       --------------    SS7
```

```
   003-020-100   --------    no  --- ---------
--------------    SS7
   004-004-004   ls02clli    yes --- ---------
--------------    SS7
   004-030-200   --------    no  --- ---------
--------------    SS7
   009-002-003   --------    no  --- ---------
--------------    SS7
   179-100-087   --------    yes --- ---------
--------------    SS7
   200-050-176   --------    yes --- ---------
--------------    SS7
   240-007-000   --------    yes --- ---------
--------------    SS7
   240-012-004   rlghncbb001 yes ---    1-111-1
11111        SS7
   240-012-005   rlghncbb002 yes ---    1-112-2
11112        SS7
   240-012-006   rlghncbb003 yes ---    1-112-3
11113        SS7
   240-012-008   --------    yes ---    1-113-5
11114        SS7

   DPCI          CLLI        BEI ELEI   ALIASA
ALIASN/N24    DMN
   2-131-1       rlghncbb023 no  ---    222-210-000
12001         SS7
   2-131-2       --------    no  ---    222-211-001
12002         SS7
   2-131-3       --------    no  ---    222-211-002
12003         SS7
   3-150-4       lsi7clli    yes --- -------------
--------------    SS7

   DPCN          CLLI        BEI ELEI   ALIASA
ALIASI          DMN
   10685         lsn5clli    yes --- --------------
----------       SS7
   11211         rlghncbb013 no  ---    222-200-200
2-121-1       SS7
   11212         rlghncbb013 no  ---    222-200-201
2-121-2       SS7

Destination table is (24 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

If the adjacent point code is not shown in the `rtrv-dstn` command output, go to the Adding a Destination Point Code procedure and add the adjacent point code to the destination point code table. After the adjacent point code has been added, continue the procedure with 5.

If the adjacent point code is shown in the `rtrv-dstn` command output, continue the procedure with 4.

4. The **APC** of the linkset cannot be the **DPC** of any exception route.

Verify that the adjacent point code of the linkset is not the **DPC** of any exception route by entering the `rtrv-rtx` command with the `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` parameter. The `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` parameter value is the adjacent point code value that will be specified for the linkset.

For this example, enter this command.

`rtrv-rtx:dpca=002-009-009`

This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
    DPCA           RTX-CRITERIA                LSN        RC     APC
    002-009-009    OPCA
                   007-008-009                 ls1305     20     001-005-000
                   008-008-100                 ls1307     40     001-007-000
 DESTINATION ENTRIES ALLOCATED:   2000
     FULL DPC(s):                   13
     EXCEPTION DPC(s):               5
     NETWORK DPC(s):                 0
     CLUSTER DPC(s):                 1
     TOTAL DPC(s):                  19
     CAPACITY (% FULL):              1%
 ALIASES ALLOCATED:              12000
     ALIASES USED:                   0
     CAPACITY (% FULL):              0%
 X-LIST ENTRIES ALLOCATED:         500
```

For this example, the `rtrv-rtx` command is entered with the following `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` parameter values:

- `dpca=002-007-008`
- `dpca=009-002-002`
- `dpca=179-100-087`
- `dpca=200-050-176`
- `dpci=3-150-4`
- `dpcn=10685`
- `dpcn=12543`

In this example, these point codes are not the **DPC** of a route exception table entry. If the adjacent point code of the linkset is not the **DPC** of a route exception table entry, no entries are displayed in the `rtrv-rtx` output, but a summary of the point code quanties is displayed, as shown in the following output example.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
    DESTINATION ENTRIES ALLOCATED:   2000
        FULL DPC(s):                   15
        EXCEPTION DPC(s):               5
        NETWORK DPC(s):                 0
        CLUSTER DPC(s):                 1
        TOTAL DPC(s):                  21
```

```
    CAPACITY (% FULL):            1%
ALIASES ALLOCATED:            12000
    ALIASES USED:                 0
    CAPACITY (% FULL):            0%
X-LIST ENTRIES ALLOCATED:       500
```

If the point code specified in this step is shown in the `DPCA` column in this step, the point code value cannot be used as an adjacent point code unless one of two actions are taken:

- Choose another adjacent point code value and repeat this procedure from 2.
- Remove all the entries displayed in this step by performing the Removing a Route Exception Entry procedure.

5. To specify the following optional parameters for the linkset, the feature that corresponds to the parameters must be shown as turned on in the `rtrv-feat` output, or enabled, and turned on if required, in the `rtrv-ctrl-feat` output, or other database entities that correspond to the parameters must be configured in the database.

   Perform the procedure, shown in the following list, that corresponds to the parameters that you wish to specify for the linkset.

   - `scrn`, `gwsa`, `gwsm`, `gwsd` – Verifying the Gateway Screening Configuration for a Linkset
   - `mtprse` – Configuring the MTP Restart Feature
   - `slsci`, `asl8` – Configuring the 5-Bit to 8-Bit SLS Conversion Feature. These parameters only apply to ANSI linksets.
   - `:islsrsb` – Activating the SLS Bit Rotation by Incoming Linkset Feature. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter of an ANSI linkset, the `rsls8` value for the linkset must be `yes`. Perform these procedures after adding the linkset.
     – Configuring the RSLS8 Value for ANSI Linksets – to change the `rsls8` value for the linkset to `yes`.
     – Changing an SS7 Linkset – to change the `islsrsb` value.
   - `gttmode` – If the value for this parameter will be `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, `cgcd`, or `cdcg`, perform the "Activating the Origin-Based SCCP Routing Feature" in *Database Administration – GTT User's Guide*. The Origin-Based SCCP Routing feature must be enabled and turned on. If the value for this parameter will be `fcd`, `fcg`, `fcgfcd`, or `fcdfcg`, perform the "Activating the Flexible Linkset Optional Based Routing Feature" procedure in *Database Administration – GTT User's Guide*. The Flexible Linkset Optional Based Routing feature must be enabled and turned on.
   - `randsls` – Configuring the System for Random SLS Generation. The value of the `randsls` parameter of the `chg-stpopts` command must be `perls`.
   - `cgttmode` - "Activating the Advanced GT Modification Feature" in *Database Administration – GTT User's Guide*. Either the AMGTT or AMGTT CgPA Upgrade feature must be enabled.
   - `ppc`/`ppca`/`ppci`/`ppcn`/`ppcn24`, `spc`/`spca`/`spci`/`spcn`/`spcn24` – Using Proxy Point Codes and Secondary Point Codes when Adding a Linkset.

If you do not wish to specify the parameters shown in this list for the new linkset, continue the procedure by performing one of these steps.

- If the `slsocbit` parameter will be specified for the new linkset, continue the procedure with 6.
- If the `multgc` parameter will be specified for the new linkset and the `slsocbit` parameter will not be specified for the new linkset, continue the procedure with 8.
- If the `slsocbit` and `multgc` parameters will not be specified for the new linkset, continue the procedure with 10.

6. To use the `slsocbit` parameter with either the `ent-ls` command, the Use of the Other **CIC** Bit feature must be on.

   Enter the `rtrv-feat` command to verify that either of this feature is on. The entry `SLSOCB = on` in the `rtrv-feat` command output shows that this feature is on. In this example, the Use of the Other **CIC** Bit feature is off.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, refer to the `rtrv-feat` command description in *Commands User's Guide*.

   If the Use of the Other **CIC** Bit feature is on (`SLSOCB = on`), continue the procedure by performing one of these steps.

   - If the `multgc` parameter will be specified for the new linkset, continue the procedure with 8.
   - If the `multgc` parameter will not be specified for the new linkset, continue the procedure with 10.

7. Turn the Use of the Other **CIC** Bit feature is on feature on by entering this command.

   `chg-feat:slsocb=on`

   > **Note:**
   >
   > Once the Use of the Other **CIC** Bit feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The Use of the Other **CIC** Bit feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the Use of the Other **CIC** Bit feature, contact your Oracle Sales Representative or Account Representative.

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
CHG-FEAT: MASP A - COMPLTD
```

Continue the procedure by performing one of these steps.

- If the `multgc` parameter will be specified for the new linkset, continue the procedure by performing one of these steps.
  - If the `rtrv-feat` command was performed in 6, continue the procedure with Oracle.
  - If the `rtrv-feat` command was not performed in 6, continue the procedure with 8.
- If the `multgc` parameter will not be specified for the new linkset, continue the procedure with 10.

8. To specify the `multgc=yes` parameter with the `ent-ls` command, the **ITU** Duplicate **Point Code** feature must be on.

   For the **ITU** Duplicate **Point Code** feature to be on, the **Multiple Point Code** feature must be on. Enter the `rtrv-feat` command to verify that either of these features are on. The entry `MPC = on` in the `rtrv-feat` command output shows that the **Multiple Point Code** feature is on. The entry `ITUDUPPC = on` in the `rtrv-feat` command output shows that the **ITU** Duplicate **Point Code** feature is on. In this example, both features are off.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, refer to the `rtrv-feat` command description in *Commands User's Guide*.

   If the **ITU** Duplicate **Point Code** feature is on (`ITUDUPPC = on`), continue the procedure with 10.

   If the **ITU** Duplicate **Point Code** feature is not on (`ITUDUPPC = off`), continue the procedure with Oracle.

9. Turn the **ITU** Duplicate **Point Code** feature on, and the **Multiple Point Code** feature if necessary, by entering one of these commands.

   To turn the **ITU** Duplicate **Point Code** feature on only.

   `chg-feat:ituduppc=on`

   To turn both the **ITU** Duplicate **Point Code** and **Multiple Point Code** features on.

   `chg-feat:mpc=on:ituduppc=on`.

> **Note:**
>
> Once the **ITU** Duplicate **Point Code** and **Multiple Point Code** features are turned on with the `chg-feat` command, they cannot be turned off.
> The **ITU** Duplicate **Point Code** and **Multiple Point Code** features must be purchased before you turn either of these features on with the `chg-feat` command. If you are not sure if you have purchased these features, contact your Oracle Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
CHG-FEAT: MASP A - COMPLTD
```

10. Add the new linkset to the database using the `ent-ls` command. Use Table 3-3 as a guide for the parameters that can be specified with the `ent-ls` command.

Table 3-3 Adding a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code
	Mandatory Parameters		
:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>
:apc/apca=<the ANSI adjacent point code of the linkset>	:apci=<the ITU-I adjacent point code of the linkset>	:apcn=<the ITU-N adjacent point code of the linkset>	:apcn24=<the ITU-N24 adjacent point code of the linkset>
See Notes 1 and 2.	See Notes 1 and 2.	See Notes 1 and 2.	See Notes 1 and 2.
:lst=<a, b, c, d, e, prx>	:lst=<a, b, c, d, e, prx>	:lst=<a, b, c, d, e, prx>	:lst=<a, b, c, d, e, prx>
See Note 12.	See Note 12.	See Note 12.	See Note 12.
	Optional Parameters		
:clli=<the CLLI value>	:clli=<the CLLI value>	:clli=<the CLLI value>	:clli=<the CLLI value>
:bei=<yes, no>	:bei=<yes, no>	:bei=<yes, no>	:bei=<yes, no>
:scrn=<the name of the Gateway Screening screen set>	:scrn=<the name of the Gateway Screening screen set>	:scrn=<the name of the Gateway Screening screen set>	:scrn=<the name of the Gateway Screening screen set>
See Note 3.	See Note 3.	See Note 3.	See Note 3.
:gwsa=<on, off>	:gwsa=<on, off>	:gwsa=<on, off>	:gwsa=<on, off>
See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.
:gwsm=<on, off>	:gwsm=<on, off>	:gwsm=<on, off>	:gwsm=<on, off>
See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.
:gwsd=<on, off>	:gwsd=<on, off>	:gwsd=<on, off>	:gwsd=<on, off>
See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.	See Notes 4 and 5.
:l3tset=1	:l3tset=1	:l3tset=1	:l3tset=1
:asl8=<yes, no>	:mtprse=<yes, no>	:mtprse=<yes, no>	:mtprse=<yes, no>
See Note 6.	See Note 15.	See Note 15.	See Note 15.

Table 3-3 (Cont.) Adding a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code
:slsci=<yes, no> See Note 6.	:slsocbit=<5 - 16, none> See Notes 17 and 18.	:slsocbit=<5 - 16, none> See Notes 17 and 18.	:slsocbit=<5 - 16, none> See Notes 17 and 18.
:mtprse=<yes, no> See Note 15.	:slsrsb=<1 - 4> See Note 18.	:slsrsb=<1 - 4> See Note 18.	:slsrsb=<1 - 4> See Note 18.
:sltset=<1 - 20>	:sltset=<1 - 20>	:sltset=<1 - 20>	:sltset=<1 - 20>
:nis=<on, off>	:nis=off	:nis=<on, off>	:nis=<on, off>
:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 16.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 16.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 16.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 16.
:spc/spca=<the ANSI secondary point code> See Notes 9 and 11.	:spci=<the ITU-I secondary point code> See Notes 9 and 11.	:spcn=<the ITU-N secondary point code> See Notes 9 and 11.	:spcn24=<the ITU-N24 secondary point code> See Notes 9 and 11.
:ppc/ppca=<the ANSI proxy point code> See Notes 10, 11, and 12.	:ppci=<the ITU-I proxy point code> See Notes 10, 11, and 12.	:ppcn=<the ITU-N proxy point code> See Notes 10, 11, and 12.	:ppcn24=<the ITU-N24 proxy point code> See Notes 10, 11, and 12.
:cggtmod=<yes, no> See Note 13.	:cggtmod=<yes, no> See Note 13.	:cggtmod=<yes, no> See Note 13.	:cggtmod=<yes, no> See Note 13.
:islsrsb=<1 - 5> See Note 14.	:islsrsb=<1 - 4> See Note 14.	:islsrsb=<1 - 4> See Note 14.	:islsrsb=<1 - 4> See Note 14.
:randsls=<all, class0, off> See Note 8.	:itutfr=<on, off>	:itutfr=<on, off>	:itutfr=<on, off>
	:multgc=<yes, no> See Note 7.	:multgc=<yes, no> See Note 7.	:multgc=<yes, no> See Note 7.
	:randsls=<all, class0, off> See Note 8.	:randsls=<all, class0, off> See Note 8.	:randsls=<all, class0, off> See Note 8.
		:apcntype=<itun, itunchina>	:apcntype=<itun, itunchina>

Table 3-3 (Cont.) Adding a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code

Notes:

a. The adjacent point code must be a full point code, cannot be an alias point code, and must be shown in the `rtrv-dstn` output. Private point codes cannot be used as an adjacent point code in this procedure. Private point codes can be assigned only to IPGWx linksets. The procedures for configuring IPGWx linksets are in *Database Administration - IP7 User's Guide*.

b. The adjacent point code cannot be shown in the `rtrv-sid` output as the system's point code or any capability point codes.

c. If a gateway screening screen set is assigned to the linkset, the gateway screening screen set must be in the database – shown in Verifying the Gateway Screening Configuration for a Linkset.

d. The `gwsa`, `gwsm`, and `gwsd` parameters can be specified only if the `scrn` parameter is specified.

> **Caution:**
>
> When Gateway Screening is in the screen test mode, as defined by the linkset parameters `gwsa=off` and `gwsm=on`, the gateway screening action in the gateway screening stop action set specified by the actname parameter of the gateway screening screen set at the end of the gateway screening process will be performed.

e. The `gwsd=on` parameter can be specified only with the `gwsa=on` parameter.

f. Refer to Table 3-9 for the combinations of the `asl8` and `slsci` parameters, and the slscnv STP option, and the results that these combinations produce. The `asl8` and `slsci` values for two linksets that are in a combined linkset should be the same.

g. The `multgc=yes` parameter can be specified only if the linkset being added will contain signaling links assigned to the IPLIMI application, and only for linksets with ITU-I or 14-bit ITU-N APCs. The `multgc=yes` parameter can be specified only if the ITU National Duplicate Point Code (ITUDUPPC) and Multiple Point Code Support (MPC) features are turned on.

h. It is recommended that when configuring `randsls` values on two linksets that are in a combined linkset that the `randsls` values for these linksets are the same. If these values are not the same, undesired SLS distribution of the traffic on these linksets may result.

i. The `spc/spca/spci/spcn/spcn24` parameter can be specified only if the Multiple Linksets to Single PC feature is enabled and turned on.

j. The `ppc/ppca/ppci/ppcn/ppcn24` parameter can be specified only if a proxy point code quantity is enabled.

k. A linkset may not contain both secondary point codes (`spc/spca/spci/spcn/spcn24`) and proxy point codes (`ppc/ppca/ppci/ppcn/ppcn24`).

l. If the linkset type for the linkset is `prx`, the first time that the APC for this linkset is specified, a proxy point code must be assigned to the APC of the linkset and that proxy point code must be specified for the linkset.

Table 3-3 (Cont.) Adding a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code
m. The `cggtmod` parameter can be specified only if either the AMGTT or AMGTT CgPA Upgrade feature is enabled. **n.** The `islsrsb` parameter can be specified only if the SLS Bit Rotation by Incoming Linkset feature is enabled. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter of an ANSI linkset, the `rsls8` value for the linkset must be `yes`. Perform these procedures after adding the linkset. • Configuring the RSLS8 Value for ANSI Linksets – to change the `rsls8` value for the linkset to `yes`. • Changing an SS7 Linkset – to change the `islsrsb` value. **o.** The `mtprse` parameter can be specified only if the ANSI or ITU MTP Restart feature is turned on. **p.** The `gttmode` parameter can be specified only if the Origin-Based SCCP Routing feature is enabled and turned on, or the Flexible Linkset Optional Based Routing feature is enabled and turned on. If the value for this parameter will be `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, `cgcd`, or `cdcg`, the Origin-Based SCCP Routing feature must be enabled and turned on. If the value for this parameter will be `fcd`, `fcg`, `fcgfcd`, or `fcdfcg`, the Flexible Linkset Optional Based Routing feature must be enabled and turned on. **q.** The `slsocbit` parameter can be specified only if the SLSOCB feature is turned on. **r.** When two linksets are used as a combined linkset, both linksets should use the same `slsrsb` and `slsocbit` values.			

For this example, enter these commands.

```
ent-
ls:lsn=ls05:apca=002-009-009:lst=a:scrn=scr2:gwsa=on :gwsm=o
ff:gwsd=on:bei=no:sltset=1:nis=off
```

```
ent-
ls:lsn=ls06:apca=002-007-008:lst=a:scrn=scr4:gwsa=on :gwsm=o
ff:gwsd=off:bei=yes:sltset=4:nis=on
```

```
ent-
ls:lsn=ls07:apca=009-002-002:lst=a:scrn=scr2:gwsa=on :gwsm=o
ff:gwsd=on:bei=no:sltset=1:nis=off:gttmode=cg
```

```
ent-
ls:lsn=atmansi0:apca=179-100-087:lst=a:scrn=scr2:gwsa=on :gw
sm=off:gwsd=off:bei=yes:sltset=16:nis=off
```

```
ent-
ls:lsn=atmansi1:apca=200-050-176:lst=a:scrn=scr1:gwsa=on :gw
sd=off:clli=rlghnccc001:bei=no:sltset=9:nis=off:islsrsb=3
```

```
ent-
ls:lsn=lsi7:apci=3-150-4:lst=a:scrn=scr1:gwsa=on:gwsd=off:sl
tset=2 :gttmode=acdcgcd:randsls=all
```

```
ent-
ls:lsn=lsn5:apcn=10685:lst=a:scrn=scr3:gwsa=on :gwsd=off:slt
set=2:itutfr=on
```

```
ent-
ls:lsn=lsn6:apcn=12543:lst=a:scrn=scr3:gwsa=on :gwsd=off:sltset=3
:itutfr=on:apcntype=itunchina:randsls=class0
```

To provision a proxy linkset for this example, enter this command.

`ent-ls:lsn=lsnpxy1:apca=004-004-004:lst=prx:ppca=002-002-002`

To provision a linkset with an existing APC that is not a proxy linkset, for this example enter this command.

`ent-ls:lsn=lsnmls1:apca=001-001-002:lst=a:spca=021-021-021`

To provision a linkset with an existing APC that is a proxy linkset, for this example enter this command.

`ent-ls:lsn=lsnmls2:apca=001-001-002:lst=prx:ppca=002-002-002`

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 08-12-17 16:23:21 GMT  EAGLE5 40.0.0
Link set table is ( 19 of 1024)  2% full
ENT-LS: MASP A - COMPLTD
```

11. Verify the changes using the `rtrv-ls` command specifying the linkset name specified in 10 with the `lsn` parameter.

For this example, enter these commands.

`rtrv-ls:lsn=ls05`

This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                                 L3T SLT                GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls05          002-009-003    scr2 1   1   no  a   0     on  off on  no
off

              SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          no     no

           RANDSLS
           off

           ISLSRSB RSLS8
           1       no

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

`rtrv-ls:lsn=ls06`

This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                               L3T SLT             GWS GWS GWS
LSN          APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls06         002-007-008   scr4 1   4   no  a   0    on  off off
no    on

            SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
         ---------------- ls06clli     1          no     no

         RANDSLS
         off

         ISLSRSB RSLS8
         1       no

         IPSG  IPGWAPC  GTTMODE           CGGTMOD
         no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=ls07
```

This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                               L3T SLT             GWS GWS GWS
LSN          APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls07         009-002-003   scr2 1    1  no  a   0    on  off on
no    off

            SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
         ---------------- ls06clli     1          no     no

         RANDSLS
         off

         ISLSRSB RSLS8
         1       no

         IPSG  IPGWAPC  GTTMODE           CGGTMOD
         no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=atmansi0
```

This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                               L3T SLT              GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI NIS
atmansi0     179-100-087    scr2 1   16  yes a   0    on  off off no    off

               SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
         ---------------- ls06clli     1          no     no

         RANDSLS
         off

         ISLSRSB RSLS8
         1       no

         IPSG  IPGWAPC  GTTMODE           CGGTMOD
         no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=atmansi1
```

This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                               L3T SLT              GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI NIS
atmansi1     200-050-176    scr1 1   9   no  a   0    on  off off no    off

               SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
         ---------------- rlghnccc001  1          no     no

         RANDSLS
         off

         ISLSRSB RSLS8
         3       no

         IPSG  IPGWAPC  GTTMODE           CGGTMOD
         no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=lsi7
```

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
```

```
                               L3T SLT              GWS GWS GWS
LSN          APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsi7         3-150-4        scr1 1   2   no  a    0    on  off off
no    off

            SPCI             CLLI        TFATCABMLQ MTPRSE ASL8
         ---------------- ----------- 1          no     ---

         SLSOCBIT SLSRSB RANDSLS ITUTFR
         none     1      all     off

         ISLSRSB
         1

         IPSG  IPGWAPC  GTTMODE          CGGTMOD
         no    no       AdvCdPA,CgPA,CdPA no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=lsn5
```

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

                               L3T SLT              GWS GWS GWS
LSN          APCN    (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5         10685          scr3  1   2   no  a    0    on  off off
no    off


            SPCN             CLLI        TFATCABMLQ MTPRSE ASL8
         ---------------- lsn5clli    1          no     ---

         SLSOCBIT SLSRSB RANDSLS ITUTFR
         none     1      off     on

         ISLSRSB
         1

         IPSG  IPGWAPC  GTTMODE          CGGTMOD
         no    no       CdPA             no

Link set table is ( 20 of 1024)  2% full
```

```
rtrv-ls:lsn=lsn6
```

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
```

```
                                 L3T SLT              GWS GWS GWS
LSN (CHINA)  APCN   (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn6         12543         scr3  1   3   no  A   0    on  off off ---
off


          SPCN             CLLI        TFATCABMLQ MTPRSE ASL8
          ---------------- ----------- 1          ---    ---

          SLSOCBIT SLSRSB RANDSLS ITUTFR
          none     1      off     on

          ISLSRSB
          1

          IPSG  IPGWAPC  GTTMODE            CGGTMOD
          no    no       CdPA               no

Link set table is ( 20 of 1024)  2% full
```

If a proxy linkset was provisioned in 10, for this example, enter this command.

`rtrv-ls:lsn=lsnpxy1`

This is an example of the possible output.

```
rlghncxa03w 09-05-14 09:24:36 EST  41.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsnpxy1       004-004-004   none 1   1   no  PRX 0    off off off no
off


              PPCA          CLLI          TFATCABMLQ MTPRSE ASL8
              002-002-002   -----------   1          ---    no

           RANDSLS
           off

           ISLSRSB RSLS8
           1       no

           IPSG  IPGWAPC  GTTMODE            CGGTMOD
           no    no       CdPA                no

Link set table is (9 of 1024) 1% full.
```

If linkset was provisioned in 10 with an existing APC that is not a proxy linkset, for this example, enter this command.

`rtrv-ls:lsn=lsnmls1`

This is an example of the possible output.

```
rlghncxa03w 09-05-14 09:24:36 EST  41.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsnmls1       001-001-001   none 1   1   no  A   0    off off off
no    off


              SPCA          CLLI          TFATCABMLQ MTPRSE ASL8
              021-021-021   -----------   1          ---    no

           RANDSLS
           off

           ISLSRSB RSLS8
           1       no

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no

Link set table is (9 of 1024) 1% full.
```

If linkset was provisioned in 10 with an existing APC that is a proxy linkset, for this example, enter this command.

`rtrv-ls:lsn=lsnmls2`

This is an example of the possible output.

```
rlghncxa03w 09-05-14 09:24:36 EST  41.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsnmls2       001-001-002   none 1   1   no  PRX 0    off off off
no    off


              PPCA          CLLI          TFATCABMLQ MTPRSE ASL8
              002-002-002   -----------   1          ---    no

           RANDSLS
           off

           ISLSRSB RSLS8
           1       no

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no
```

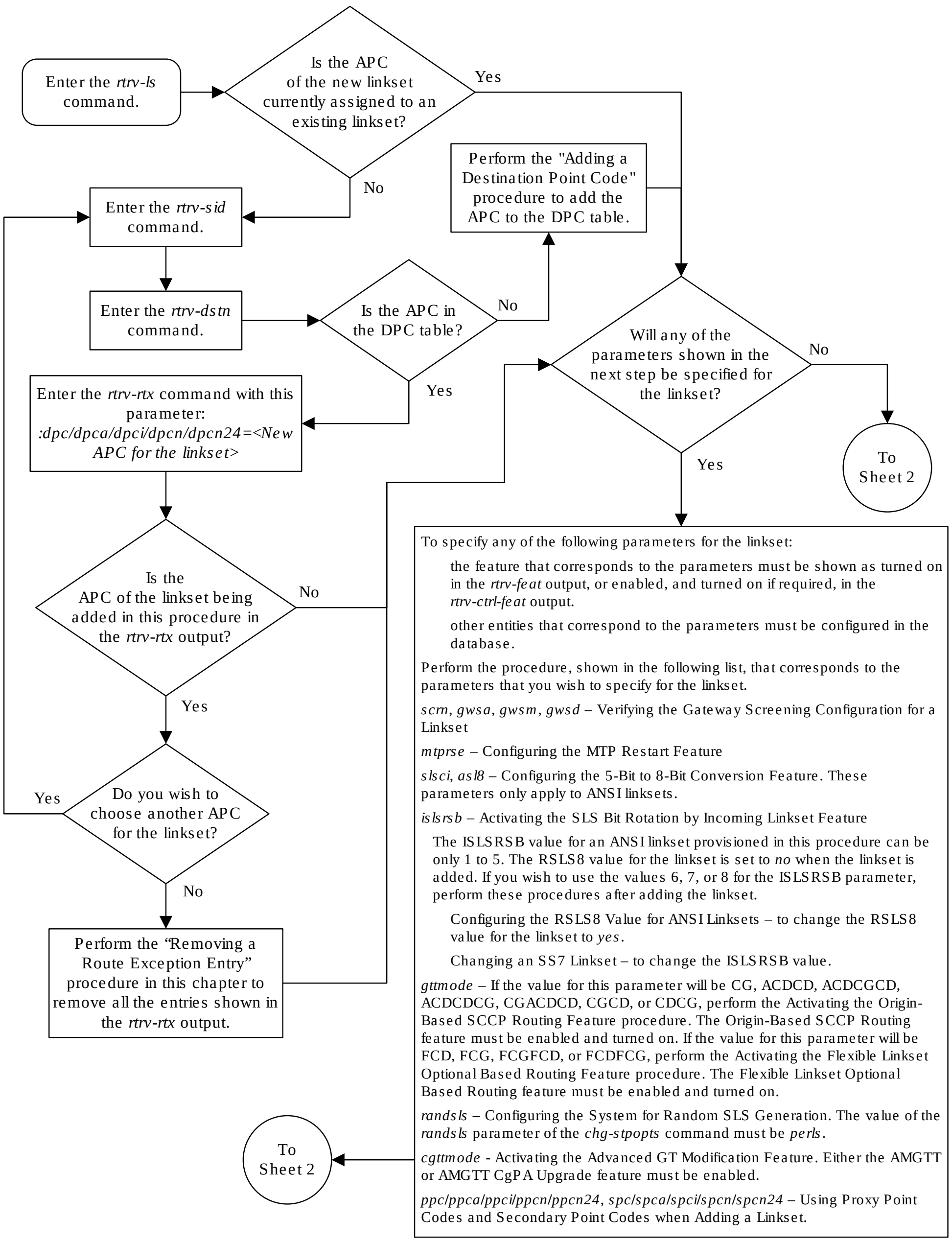
```
Link set table is (9 of 1024) 1% full.
```

12. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

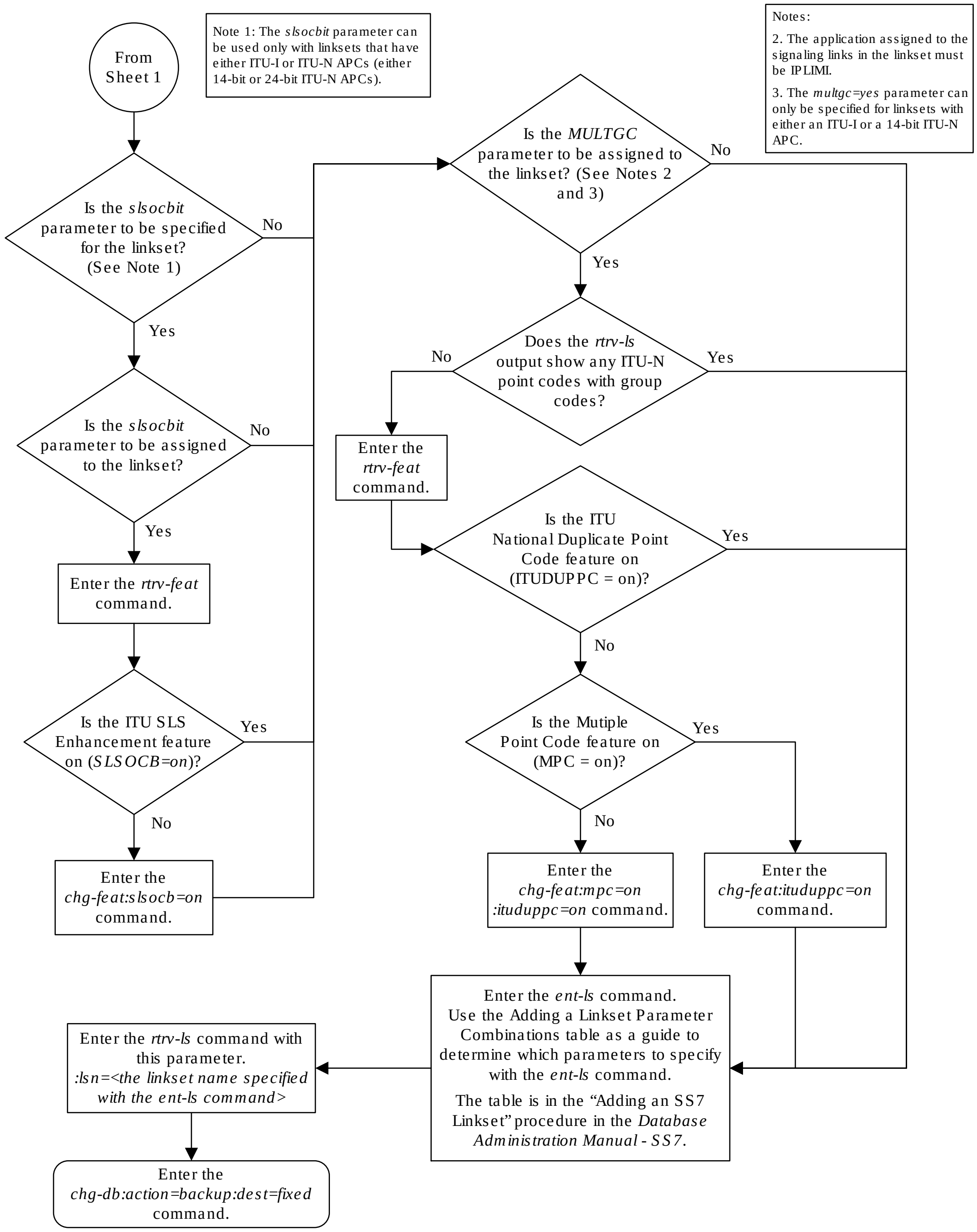
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-1 Adding a SS7 Linkset



Sheet 1 of 2



Sheet 2 of 2

3.4 ITU SLS Enhancement

The **ITU SLS** Enhancement gives customers the ability to modify the method the **EAGLE** distributes traffic across **SS7** links.

The **EAGLE** uses the least significant bit of the **SLS** to load share between linksets of a combined linkset. **ITU ISUP** messages use a **SLS** that is obtained from the lower 4 bits of the **CIC** field representing the circuit being used. Figure 3-2 shows the **ITU ISUP** routing label with the **CIC** field.

Figure 3-2 ITU ISUP Routing Label with CIC

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Bit Location
		DPC														Routing Label word 1
SLS (CIC)				OPC												Routing Label word 2
Spare				“Other” CIC bits (bits 5-16)												ISUP CIC (cont.)

CIC selection can be determined based on an odd or even method where a **SSP** uses either all odd **CICs**, or all even **CICs**, to help prevent “glaring” (that is, 2 **SSPs** attempting to seize the same trunk at the same time). This causes the least significant bit of the **SLS** to be fixed. If the least significant bit is fixed, inadequate load sharing occurs for the **SS7** network. This situation can also occur within a single linkset (international), since the **EAGLE** also uses the lower 4 bits of the **SLS** (containing a fixed least significant bit) to select a link within a linkset.

This enhancement provides the user three options for addressing the problem:

- Bit Rotation – The EAGLE rotates the 4 bits of the **SLS**, thus changing the least significant bit of the **SLS**. If selected, this option is applied to all **ITU** messages. This option is set with the `slsrsb` parameter of either the `ent-ls` or `chg-ls` commands. This action takes place on the outgoing linkset. More information on this option can be found in Bit Rotation.
- Use of Other **CIC** Bit – The **EAGLE**derives the **SLS** from the bits 2 through 4 of the **CIC** to serve as the three lower bits of **SLS**, and one other bit of the **CIC** to serve as the most significant bit of the **SLS**. If selected, this option is only applied to ITU **ISUP** messages. This option is set with the `slsocbit` parameter of either the `ent-ls` or `chg-ls` commands. More information on this option can be found in Use of the Other CIC Bit.
  Before the Use of the Other **CIC** Bit option can be set, the Other **CIC** Bit Used feature must be turned on with the `chg-feat` command and the `slsocb=on` parameter. This can be verified with the `SLSOCB = on` entry of the `rtrv-feat` command output.

  The `slsrsb` and `slsocbit` parameters can only be specified for linksets that contain either an **ITU** international or **ITU** national adjacent point code (either a 14-bit or 24-bit **ITU**-N adjacent point code).

  The value of the `slsrsb` and `slsocbit` parameters are only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command.

  > **Note:**
  >
  > When two linksets are used as a combined linkset, both linksets should use the same `slsrsb` and `slsocbit` values.

> **Note:**
>
> If the randsls parameter of the chg-stpopts command, a system-wide option, is set to either all or class0, the **EAGLE** uses the Random **SLS** Generation feature to perform load sharing between **ITU** linksets. The slsrsb parameter value is ignored. However, the ent-ls and chg-ls commands allow the slsrsb parameter value to be specified. For more information on the Random **SLS** Generation feature, refer to Configuring the System for Random SLS Generation.

- Incoming Bit Rotation - The EAGLE changes the least significant bit of the SLS on ANSI and ITU messages on incoming linksets by rotating the 4 bits of the **SLS**. This option is set with the islsrsb parameter of either the ent-ls or chg-ls commands. More information on this option can be found in Incoming Bit Rotation.

Only the link selection algorithm is modified by this feature, not the actual **SLS** field of the message (that is, the **SLS** value received by the **EAGLE** is the **SLS** value sent by the **EAGLE**).

Bit Rotation

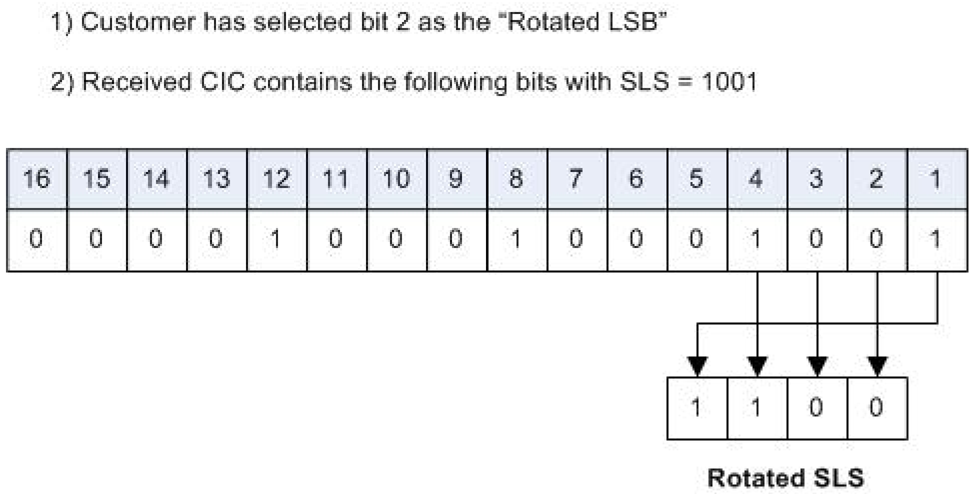
To alleviate the situation of the **EAGLE** selecting the same linkset of a combined linkset, the customer can apply the bit rotation option. Bit rotation can be used, on a per linkset basis, to ensure the **EAGLE** does not use the static least significant bit (always 0 or always 1) in the received **SLS** for linkset selection.

When defining a link set using the ent-ls or chg-ls commands, the customer will be able to select which bit (1-4) of the **SLS** field to use as the least significant bit for link set selection. This rotation only affects the 4 bits of the **SLS** during linkset selection, as follows:

- If bit 4 is selected, bit locations 4 3 2 1 will be rotated to 3 2 1 4.
  For example: **SLS** = 0110 becomes Rotated SLS = 1100. SLS = 1011 becomes Rotated SLS = 0111
- If bit 3 is selected, bit locations 4 3 2 1 will be rotated to 2 1 4 3.
  For example: SLS = 0110 becomes Rotated SLS = 1001. SLS = 1011 becomes Rotated SLS = 1110
- If bit 2 selected, bit locations 4 3 2 1 will be rotated to 1 4 3 2.
  For example: SLS = 0110 becomes Rotated SLS = 0011. SLS = 1011 becomes Rotated SLS = 1101
- If bit 1 is selected, no rotation is performed, since bit 1 is the existing least significant bit. Bit 1 is the default value.

Figure 3-3 shows an example of bit rotation.

Figure 3-3 Example of Bit Rotation



After the **SLS** is rotated, the existing algorithm for selecting a linkset and signaling link is performed, and the message is sent out the selected link. Note that the **SLS** is modified only for the link selection algorithm, and is not modified in the outgoing message.

Use of bit rotation alone does not guarantee an even distribution of **ITU-ISUP** messages across all links within a linkset. The **EAGLE** uses all 4 bits of the **SLS** to determine the actual link to route messages. Since the static bit is simply rotated within the **SLS**, all possible values of the **SLS** field will still not be realized. A second option, Use of the Other **CIC** Bit, must be applied to guarantee even distribution across all links within the linkset.

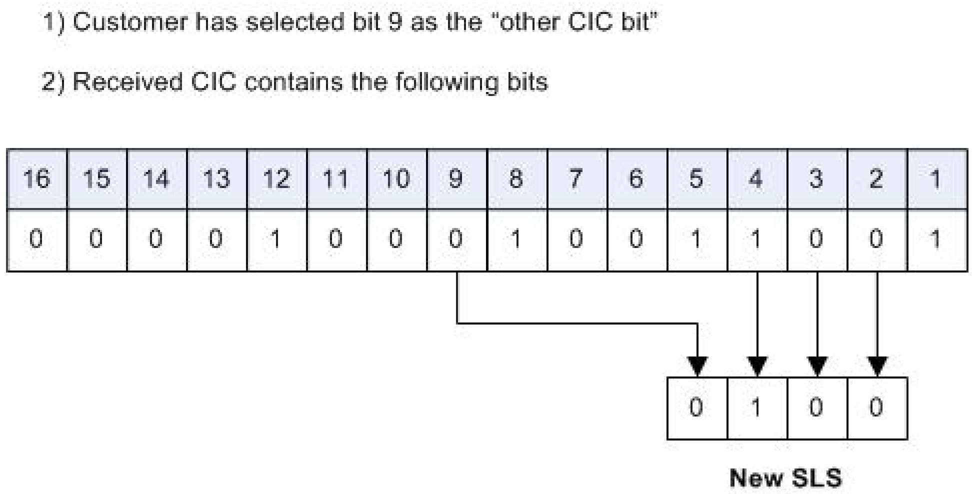
Use of the Other CIC Bit

The Use of the Other **CIC** Bit option can be applied by the customer to alleviate the problem of the **EAGLE** not load sharing between all links within a linkset. When defining a linkset with the `chg-ls` or `ent-ls` command, the user can specify whether the Use of the Other **CIC** Bit option is to be used during link selection. If the option is to be used, the customer can also specify which bit (bits 5 through 16 of **CIC**) is to be used as the "other **CIC** bit".

During link selection, the specified bit acts as the most significant bit of the new **SLS**, and bits 2 through 4 of the received **CIC** become the least significant bits of the new **SLS**.

Figure 3-4 shows how the new **SLS** field is generated using the "other **CIC** bit."

Figure 3-4 SLS creation Using "Other CIC Bit"



After the **SLS** is generated using the "other **CIC** bit", the existing algorithm for selecting a linkset and signaling link is performed, and the message is sent out from the selected link. Note that the **SLS** is modified only for the link selection algorithm, and is not modified in the outgoing message.

Incoming Bit Rotation

Incoming Bit Rotation is set on the incoming linkset, where the existing SLS bit rotation option is set on the outgoing linkset. The algorithm used for rotating the SLS bits on outgoing linksets is also used on incoming linksets. This method provides additional capability to fairly distribute traffic across links and linksets, however it still does not guarantee an even distribution of messages for all set of input SLS values. Rotating SLS Bits on outgoing linksets is supported only for ITU linksets. Rotating SLS bits on incoming linksets is supported for ANSI and ITU linksets. For ITU linksets, the SLS value is only four bits and all four bits are considered for bit rotation. Table 3-4 shows examples of bit rotation for ITU linksets.

Table 3-4 ITU SLS Bit Rotation

Incoming ITU SLS Value	Least Significant Bit Being Rotated	Rotated SLS Value
0110	2	0011
1110	3	1011
0010	1	0010
1101	4	1011

For ANSI linksets, which may have a five or eight bit SLS value, the full five or eight bits are considered for link and linkset selection. Table 3-5 shows the rules that apply to rotating the SLS bit value in an ANSI linkset.

Table 3-5 ANSI Linkset Incoming Bit Rotation Rules

Rule	Incoming Linkset ASL8 Value	Incoming Linkset RSLS8 Value	ISLSRSB Values	SLSCNV/ Outgoing Linkset SLSCI Value	Incoming SLS Bit Rotation (ISLSBR)
1	No	No	1 - 5	No	The least significant 5 bits of the SLS are considered for rotation.
2	No	No	1 - 5	Yes	The least significant 5 bits of the SLS are considered for rotation.
3	No	Yes	1 - 8	No	No incoming SLS bit rotation is performed. The 5-Bit to 8-Bit SLS Conversion feature must be turned on to perform incoming SLS bit rotation.
4	No	Yes	1 - 8	Yes	The 8 bit SLS value is obtained after the 5-bit to 8-bit SLS conversion is performed is considered for rotation.
5	Yes	No	1 - 5	N/A	The least significant 5 bits of the SLS are considered for rotation.
6	Yes	Yes	1 - 8	N/A	The 8-bit SLS value is considered for rotation.

Rotating the SLS bits on ANSI linksets is based on the combination of the ASL8, RSLS8, SLSCNV/SLSCI, and ISLSRSB parameter values.

The ASL8 parameter value for the incoming linkset specifies whether the adjacent node is sending messages with a 5-bit SLS or an 8-bit SLS.

If the ASL8 parameter value for the incoming linkset is No, and the global SLSCNV/SLSCI parameter value for the outgoing linkset is Yes, the 5-Bit to 8-Bit SLS Conversion feature is applied to the incoming 5-bit SLS value.

The RSLS8 parameter value for the incoming linkset specifies the number of SLS bits to be considered for rotation. If the RSLS8 value is Yes, 8 bits are considered for rotation. If the RSLS8 value is No, the least significant 5 bits of the SLS are considered for rotation. If the ASL8 value is No, the RSLS8 value is Yes, and the STPCNV/SLSCI value is No, then no rotation is performed. See Table 3-6.

Table 3-6 ANSI SLS Bit Rotation

Incoming ANSI SLS	Incoming Linkset RSLS8 Value	Least Significant Bit Being Rotated	Outgoing ANSI SLS	Rotated SLS	Rule Applied
11000110	No	Bit 2	11000110	11000011	5
01011110	Yes	Bit 7	01011110	01111001	6
10010	No	Bit 4	**101**10010	**101**01010	2
10010	Yes	Bit 8	**101**10010	**01**10010**1**	4
01101	No	Bit 4	01101	10101	1
01101	Yes	Bit 7	01101	No Rotation	3

The digits shown in bold show the digits that were added to the SLS value by the 5-Bit to 8-Bit SLS Conversion feature. The SLS bits are rotated in this manner.

1. All the bits to the right side of the bit chosen to the least significant bit are removed as a block.
2. The remaining bits are right justified.
3. The block of digits that was removed in step 1 is inserted to the left of the bits that were right justified in step 2.

The new SLS value created after the SLS bits have been rotated is used for linkset and signaling link selection.

Combining the Bit Rotation, Use of the Other CIC Bit, Incoming Bit Rotation, and Random SLS Options

The Bit Rotation, Use of the Other CIC Bit, Incoming Bit Rotation, or Random SLS option, can be applied to provide and even distribution of ITU and ANSI messages sent by the EAGLE. If these options have been activated for a given linkset, the SLS field is processed in the following order.

1. If the RANDSLS value (system-wide or on the incoming linkset) is `on`, then an 8-bit random SLS value is generated.
2. If the Random SLS option is applied and the system-wide SLSREPLACE value is `on`, the randomly generated SLS value is replaced. Go to step 5.
3. If the global SLSCNV/SLSCI value for the outgoing linkset is `on`, the 5-bit ANSI SLS value is converted to an 8-bit SLS value using the 5-Bit to 8-bit SLS Conversion feature.
4. If the Random SLS option is not applied, the converted SLS value is modified using the Incoming Bit Rotation option.
5. The modified SLS value is used by the existing linkset and signaling link selection algorithm to select a linkset and a signaling link.

6. If the linkset type of the outgoing linkset is C (`lst=c`), the SLS value is modified using the standard fifth bit rotation, replaced in the MSU, and sent to the selected signaling link.

3.5 ITU TFR Procedures

Receiving TFR Messages

If **ITU TFR** procedures have been enabled for the linkset and a **TFR** message is received on that linkset, the **EAGLE** marks the route to the destination as restricted and performs controlled rerouting of the messages that are destined for the destination specified in the **TFR** message.

If **ITU TFR** procedures have not been enabled for the linkset and a **TFR** message is received on that linkset, the **TFR** message is converted to a **TFA** (transfer allowed) message and traffic is routed to the destination specified in the **TFR** message. When this condition is present and a **TFR** is received on this linkset, **UIM** 1233 is displayed showing that a **TFR** was received on a linkset that does not support the **TFR** procedure.

When a **TFR** message is received for a route that is already prohibited, and no alternative route exists, the traffic to the concerned node is restarted toward the signaling point from which the **TFR** message was received.

Invalid TFR messages

The **TFR** message is ignored under any of these conditions:

- The **TFR** message is not from an adjacent point code.
- The point code specified in the **TFR** message is being sent from that same point code.
- The **TFR** message is from an unknown destination.
- The **TFR** message is from an adjacent point code, but the adjacent point code is not the route for concerned point code.
- If the route to the concerned point code is already restricted.
- The route to concerned point code not found or is unavailable.

Sending TFR Messages

The **EAGLE** must send a **TFR** message containing the affected point code (restricted destination) to all accessible adjacent nodes, whose linkset has the **TFR** procedure enabled, when the following conditions are in effect:

- When long term failure occurs on the **ITU**-N linkset (primary) used to route messages to the affected point code. Long term failure occurs when all links of a linkset remain unavailable for more than the amount of time specified by level 3 timer T11.
- While waiting for “long term failure” to be determined, if congestion (or “danger of congestion”) is detected on an alternate linkset used to route messages to the affected point code, then **TFRs** are sent immediately without waiting for level 3 timer T11 to expire. For example: level 3 timer T11 is set to 30 seconds, the links of the linkset to the adjacent node fail and **MSUs** are now sent out the alternate linkset. Within 10 seconds of the failure, congestion is detected on the alternate

linkset, so **TFR** messages are sent to each adjacent point code (if linkset has **ITUTFR** procedures enabled) for each destination (affected point code) routed through that node.

- When an adjacent node becomes accessible by an alternate route, the **EAGLE** sends a **TFR** for each destination that is restricted to the node.
- During restarts, **TFRs** are broadcast to all accessible adjacent nodes for each restricted destination.

Unlike the **ANSI** network, the **ITU** national network does not use response method **TFR** messages. The **ITU** national network only uses broadcast method **TFR** messages that are sent to all adjacent nodes under the conditions described above.

> **Note:**
>
> In **ANSI** networks, response method **TFRs** are sent to adjacent nodes in response to a **MSU**, when that node continues to send **MSUs** after a broadcast method **TFR** has already been sent.

The **EAGLE** maintains the status (allowed, restricted, or prohibited) for all destinations. XREF shows the type of message sent when a destination transitions from one status to another.

Table 3-7 Route Management Messages Sent on Status Transition

Status Transition	ITUTFR Procedures Enabled	ITUTFR Procedures Disabled
Prohibited to **Restricted**	**TFR**	**TFA**
Allowed to **Restricted**	**TFR**	None
Restricted to Prohibited	**TFP**	**TFP**
Restricted to Allowed	**TFA**	None

3.6 Per-Linkset Random SLS

To achieve load balancing of outgoing traffic on **ITU** linksets, linksets that have either an **ITU**-I, 14-bit **ITU**-N, or 24-bit **ITU**-N adjacent point code assigned, the **EAGLE** 5 **ISS** currently uses the Random **SLS** option to generate a new **SLS** (signaling link selector) value. The randomly generated **SLS** value is used to select an outgoing signaling link and linkset. Random **SLS** generation applies to either Class 0 **SCCP** messages or to both Class 0 and Class 1 **SCCP** messages. The Random **SLS** option is configured using the `randsls` parameter of the `chg-stpopts` command. Refer to Configuring the System for Random SLS Generation for more information on configuring the Random **SLS** option.

This method of selecting outgoing signaling links and linksets is applied system-wide to all **ITU** linksets. This may cause problems for some end nodes that may have specific requirements for handling incoming **SCCP** messages, such as sequencing of Class 1 **SCCP** messages.

The **Per-Linkset Random SLS** feature provides the ability to apply Random **SLS** generation to Class 0 and Class 1**SCCP** messages on specific outgoing **ITU** linksets and to Class 0 SCCP messages and ISUP messages on specific incoming ANSI linksets. The `randsls` parameter of either the `ent-ls` or `chg-ls` command applies this feature to the linkset. The `randsls` parameter has three values:

- `off` – Random **SLS** generation is not applied to the specified linkset.
- `class0` – Random **SLS** generation is applied to only Class 0 **SCCP** messages.
- `all` – Random **SLS** generation is applied to both Class 0 and Class 1 **SCCP** messages on a specific outgoing ITU linksets, and to both Class 0 SCCP and ISUP messages on specific ANSI linksets.

When per-linkset random SLS is applied to ANSI linksets, linksets that have ANSI adjacent point codes, the SLS of the message is replaced with a randomly generated SLS, only if the `slsreplace` parameter value is set to `yes`. The `slsreplace` parameter value is shown in the `rtrv-ss7opts` output. If the `slsreplace` parameter value is `no`, the EAGLE 5 ISS uses the randomly generated SLS to select the signaling link, but the message retains the original SLS. If the linkset’s `asl8` or `slsci` parameter value is `off`, or the `chg-stpopts slscnv` parameter is `off`, a 5-bit SLS is placed in the message. The three most significant bits of the SLS are zeroes. If the linkset’s `asl8` or `slsci` parameter value is `on`, or the `slscnv` parameter of the `chg-stpopts` command is `on`, an 8-bit SLS is placed in the message. The linkset’s `asl8` parameter value is not used for internal linkset and signaling link selection. The linkset's `asl8` parameter applies only to incoming linksets. The linkset's `slsci` parameter applies only to outgoing linksets. The randomly generated SLS value is used for internal linkset and signaling link selection. When an ANSI to ITU conversion takes place, the randomly generated SLS value for the incoming ANSI linkset is used for internal linkset and signaling link selection and Random SLS generation on outgoing linkset is not performed.

The `randsls` parameter is optional. If the `randsls` parameter is not specified when adding a linkset with the `ent-ls` command, the value of the `randsls` parameter is `off`. If the `randsls` parameter is not specified when changing a linkset with the `chg-ls` command, the value of the `randsls` parameter is not changed.

The value of the `randsls` parameter assigned to the linkset is displayed in the `RANDSLS` column of the `rtrv-ls` command output. The `RANDSLS` column is displayed only when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command. All linksets having a particular `randsls` value can be displayed by entering the `rtrv-ls` command with the `randsls` parameter with one of these values:

- `off` – Displays the linksets where random **SLS** generation is disabled.
- `class0` – Displays the linksets where random **SLS** generation for Class 0 **SCCP** traffic is enabled.
- `all` – Displays the linksets where random **SLS** generation for Class 0 and Class 1 **SCCP** traffic on a specific outgoing ITU linksetsis enabled, and Class0 SCCP and ISUP messages on specific incoming ANSI linksets is enabled..

For random SLS generation to be performed on a specific linkset, the `randsls` parameter value for that linkset must be set to either `class0` or `all`. The system-wide random SLS STP option `randsls` must be set to `perls` using the `chg-stpopts` command with the `randsls=perls` parameter. Refer to Configuring the System for Random SLS Generation for more information on configuring the system-wide Random **SLS** option, and, if Random SLS is applied to ANSI linksets, to configure the SS7 option for replacing the SLS in the message with the randomly generated SLS.

It is recommended that when configuring `randsls` values on two linksets that are in a combined linkset that the `randsls` values for these linksets are the same. If these values are not the same, undesired **SLS** distribution of the traffic on these linksets may result.

3.7 Verifying the Gateway Screening Configuration for a Linkset

This procedure is used to verify that the screen set that will be assigned to the linkset, and its associated screens, is in the database.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2           001-207-000    none 1   1   no  B   6    off off off no
off
ls04           001-002-003    scr2 1   1   no  a   4    off off off yes
off
ls1305         001-005-000    none 1   1   no  A   1    off off off no
off
ls1307         001-007-000    none 1   1   no  A   1    off off off no
off
e1m1s1         001-001-003    none 1   1   no  A   7    off off off no
off
e1m1s2         001-001-002    none 1   1   no  A   7    off off off no
off

                                  L3T SLT              GWS GWS GWS
LSN            APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i          1-207-0        none 1   1   no  B   4    off off off ---   on
ls1315         0-015-0        none 1   1   no  A   1    off off off ---
off
ls1317         0-017-0        none 1   1   no  A   1    off off off ---   on
e1m2s1         1-011-1        none 1   1   no  A   7    off off off ---
off
e1m2s2         1-011-2        none 1   1   no  A   7    off off off ---
off

Link set table is (10 of 1024) 1% full.
```

   A screenset that is assigned to another linkset can be assigned to the new linkset or the linkset that is being changed. If you wish to use a screenset shown in the `rtrv-ls` output, continue the procedure by performing one of these actions.

   - If you wish to examine the content of the screen set, continue the procedure with the 3.
   - If you do not wish to examine the content of the screen set, and the screen set is being assigned to a new linkset, this procedure is finished. If the screen set is being assigned to an existing linkset, continue the procedure with 5.

If you do not wish to use a screenset shown in the `rtrv-ls` output, continue the procedure with the 2.

2. Verify that the gateway screening screen set that is to be assigned to the linkset is in the database by entering the `rtrv-scrset` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-28 16:37:05 GMT EAGLE5 40.0.0
ENTIRE GWS DATABASE IS 1% FULL
CDPA + AFTPC TABLES ARE 1% FULL
SCREEN SET TABLE IS (12 OF 255) 5% FULL
THERE ARE 0 SEAS SCREEN SETS USED ( prefix 00nn )
THERE ARE 12 EAGLE SCREEN SETS USED

SCRN  NSFI    NSR/ACT  FULL  RULES  TABLES  DESTFLD
fld1  OPC     fld2       1%      5  4       NO
gws1  OPC     gws4       1%      9  7       NO
gws2  BLKOPC  gws5       1%      5  4       NO
ls01  SIO     ls02       1%      3  3       YES
scr1  OPC     opc1       1%     13  10      YES
scr2  OPC     opc2       2%     75  22      YES
scr3  OPC     opc3       2%     75  22      YES
scr4  OPC     opc1      51%   2075  22      NO
scr5  OPC     opc1      51%   2075  22      YES
scr6  OPC     opc1      51%   2075  22      NO
ss28  OPC     opc1      51%   2075  22      YES
wrd1  SIO     iec        1%      6  5       YES
```

   If you wish to examine the contents of a particular screen set, continue the procedure with 3.

   If you do not wish to examine the content of the screen set, and the screen set is being assigned to a new linkset, this procedure is finished. If the screen set is being assigned to an existing linkset, continue the procedure with 5.

   If the screen set is being assigned to a new linkset, this procedure is finished. If the screen set is being assigned to an existing linkset, continue the procedure with 5.

3. Enter the `rtrv-scrset` command specifying a screen set name shown in the `SCRN` field of either the `rtrv-scrset` command executed in 2 or the `rtrv-ls` command executed in 1.

   For this example, enter this command.

   `rtrv-scrset:scrn=scr1`

   This is an example of the possible output.

```
rlghncxa03w 08-12-14 16:39:04 GMT EAGLE5 40.0.0
SCRN  NSFI    NSR/ACT   RULES  DESTFLD
scr1  OPC     opc1          1    Y
      BLKDPC  bkd2          2
      CGPA    cgp1          3
      TT      tt1           1
```

```
TT      tt2         1
TT      tt3         1
CDPA    cdp1        1
CDPA    cdp2        1
CDPA    cdp3        1
AFTPC   end1        1
```

The output of this command shows the screens that make up the screen set. These screens can be examined by entering the gateway screening retrieve command corresponding to the value in the `NSFI` field and specifying the screening reference name shown in the `NSR/ACT` field.

If you wish to examine the content of these screens, continue the procedure with 4.

If you do not wish to examine the content of these screens, and the screen set is being assigned to a new linkset, this procedure is finished. If the screen set is being assigned to an existing linkset, continue the procedure with 5.

4. Enter the gateway screening retrieve command corresponding to the value in the `NSFI` field and specifying the screening reference name shown in the `NSR/ACT` field

   For this example, enter these commands.

   `rtrv-scr-opc:sr=opc1`

   The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED OPC
SR     NI        NC        NCM       NSFI     NSR/ACT
opc1   001       001       001       BLKOPC   bkd2
```

   `rtrv-scr-blkdpc:sr=bkd2`

   The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = BLOCKED OPC
SR     NI        NC        NCM       NSFI     NSR/ACT
bkd2   002       002       002       FAIL     ------
bkd2   C         C         C         CGPA     cgp1
```

   `rtrv-scr-cgpa:sr=cgp1`

   The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED CGPA
SR     NI        NC        NCM       SSN       RI    SCCPMT    NSFI     NSR/ACT
cgp1   007       007       007       250       SSN   017       TT       tt1
cgp1   007       007       008        50       SSN   017       TT       tt2
cgp1   007       007       009        75       SSN   017       TT       tt3
```

```
rtrv-scr-tt:sr=tt1
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED TT
SR     TYPE      NSFI   NSR/ACT
tt1    250       CDPA   cdp1
```

```
rtrv-scr-tt:sr=tt2
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED TT
SR     TYPE      NSFI   NSR/ACT
tt2      50      CDPA   cdp2
```

```
rtrv-scr-tt:sr=tt3
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED TT
SR     TYPE      NSFI   NSR/ACT
tt3    100       CDPA   cdp3
```

```
rtrv-scr-cdpa:sr=cdp1
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED CDPA
SR     NI        NC       NCM        SSN       SCMGFID  NSFI     NSR/ACT
cdp1   007       007      007        001       100      AFTPC    end1
```

```
rtrv-scr-cdpa:sr=cdp2
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED CDPA
SR     NI        NC       NCM        SSN       SCMGFID  NSFI     NSR/ACT
cdp2   007       007      008        001       120      AFTPC    end1
```

```
rtrv-scr-cdpa:sr=cdp3
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED CDPA
SR     NI        NC       NCM        SSN       SCMGFID  NSFI     NSR/ACT
cdp3   007       007      009        001       150      AFTPC    end1
```

```
rtrv-scr-aftpc:sr=end1
```

The following is an example of the possible output.

```
rlghncxa03w 08-12-25 15:30:30 GMT  EAGLE5 40.0.0
SCREEN = ALLOWED AFTPC
SR     NI        NC        NCM       SSN       NSFI     NSR/ACT
end1   008       008       008       250       STOP     ------
```

If you do not with to assign this screen set to the linkset, perform the "Adding a Screen Set" procedure in the *Database Administration Manual - Gateway Screening* to add the desired screen set to the database.

If the screen set is being assigned to a new linkset, this procedure is finished. If the screen set is being assigned to an existing linkset, continue the procedure with 5.

5. Remove the existing screen set assignment from the linkset by entering the `chg-ls` command with the name of the linkset and the `scrn=none` parameter.

   For this example, enter this command.

   `chg-ls:lsn=ls04:scrn=none`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-17 16:23:21 GMT  EAGLE5 40.0.0
Link set table is ( 19 of 1024)  2% full
CHG-LS: MASP A - COMPLTD
```

6. Verify the changes using the `rtrv-ls` command specifying the linkset name specified in 5 with the `lsn` parameter.

   For this example, enter this command.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 09-10-17 11:43:04 GMT EAGLE5 41.1.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls04          001-002-003    none 1   1   no  a   4    off off off yes
off

          CLLI         TFATCABMLQ MTPRSE ASL8
```

```
          ls04clli     2          no     no

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

                                L2T               PCR   PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1    N2
          1205  b    0   LIMDS0   1    56000  BASIC ---   -----
          1213  b    1   LIMDS0   1    56000  BASIC ---   -----
          1211  a    2   LIMDS0   1    56000  BASIC ---   -----
          1207  b    3   LIMDS0   1    56000  BASIC ---   -----

Link set table is ( 19 of 1024)  2% full
```

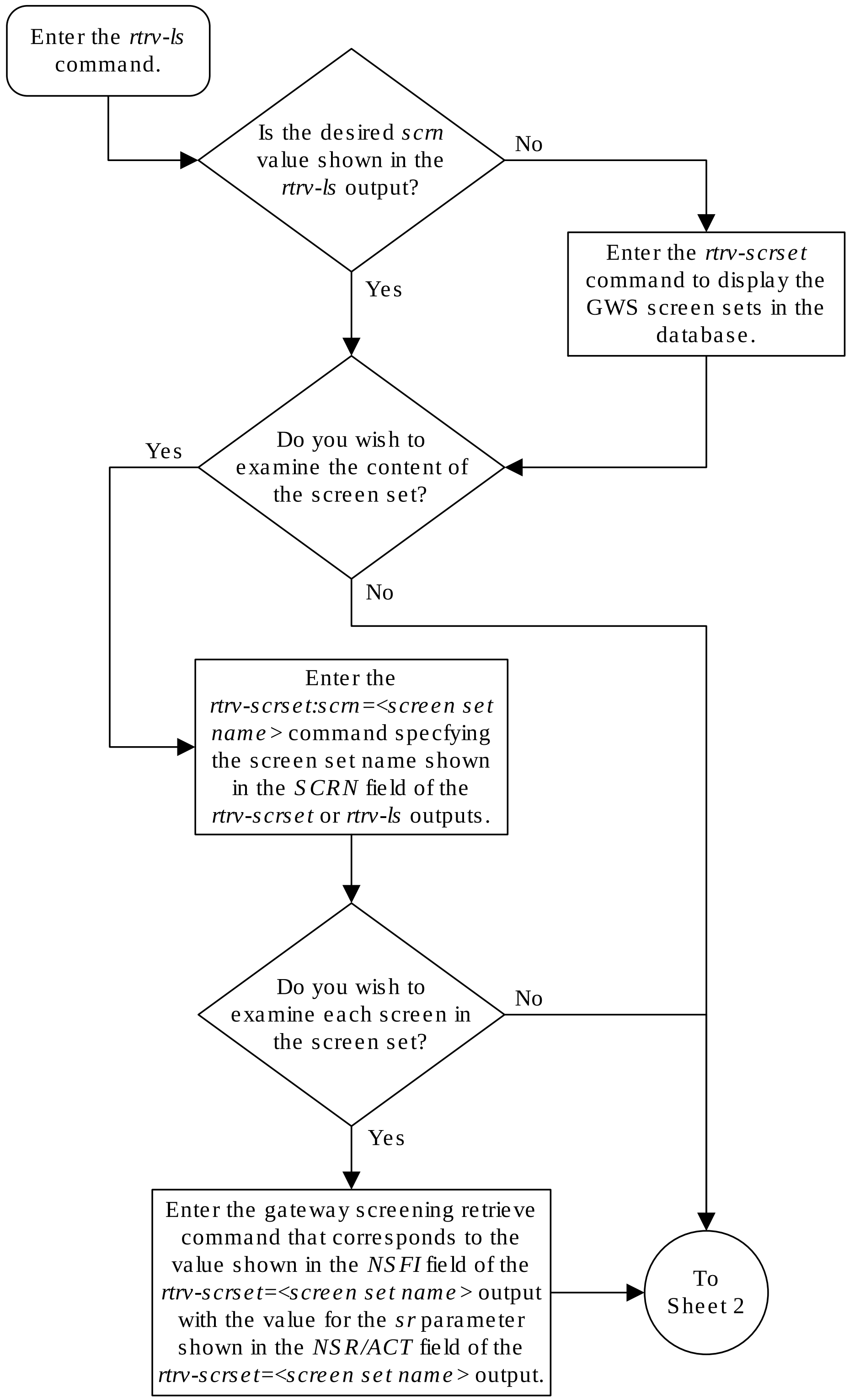
7. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

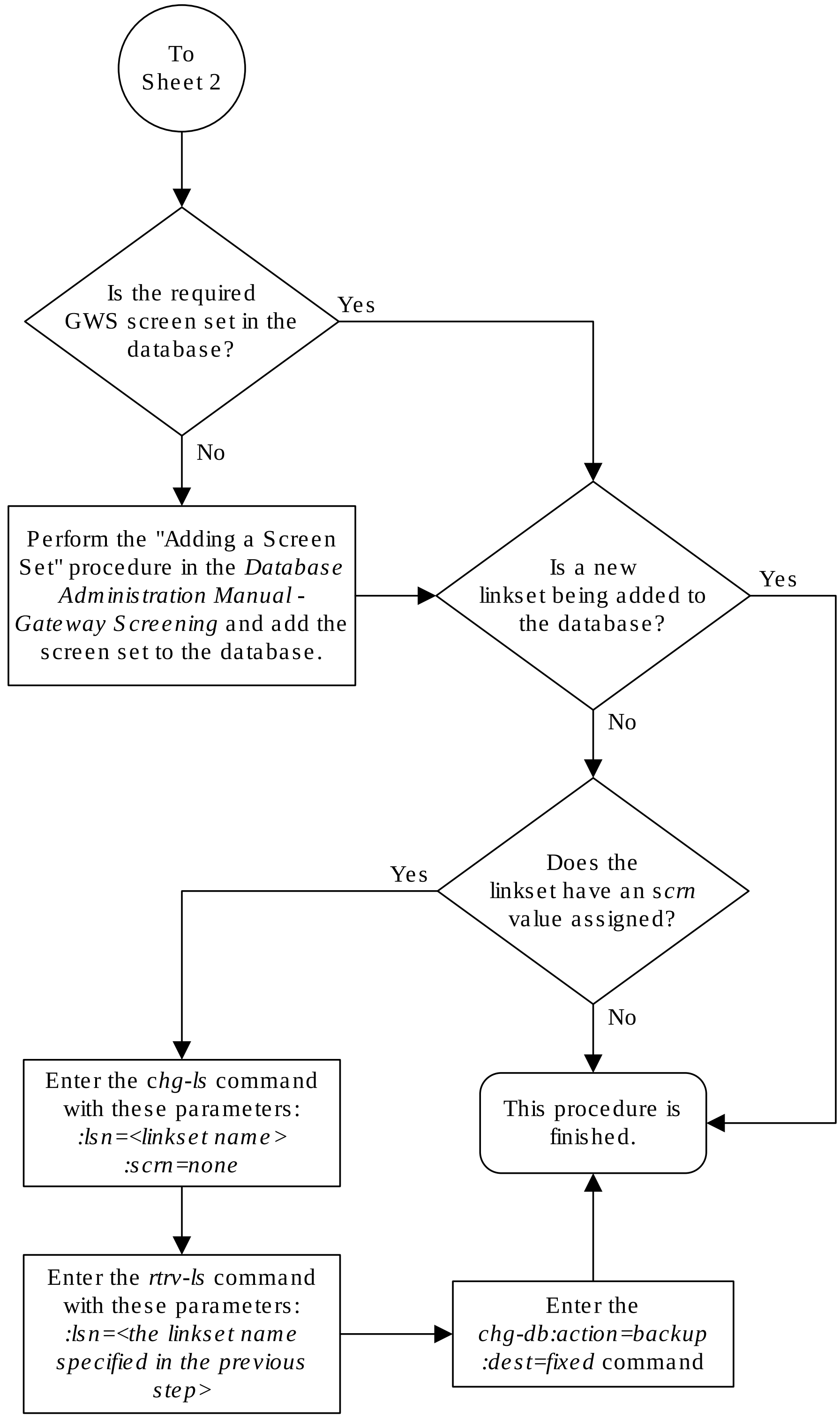
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

   This procedure is finished.

Figure 3-5 Verifying the Gateway Screening Configuration for a Linkset



Sheet 1 of 2


To Sheet 2
Is the required GWS screen set in the database?
Yes
No
Perform the "Adding a Screen Set" procedure in the Database Administration Manual - Gateway Screening and add the screen set to the database.
Is a new linkset being added to the database?
Yes
No
Does the linkset have an scrn value assigned?
Yes
No
Enter the chg-ls command with these parameters: :lsn=<linkset name> :scrn=none
This procedure is finished.
Enter the rtrv-ls command with these parameters: :lsn=<the linkset name specified in the previous step>
Enter the chg-db:action=backup :dest=fixed command

Sheet 2 of 2

3.8 Configuring the MTP Restart Feature

This procedure is used to configure the MTP Restart feature with the following commands and parameters.

- `chg-feat` - `mtprs=on` (to turn on MTP Restart for ANSI signaling links) and `itumtprs=on` (to turn on MTP Restart for ITU signaling links)
- `chg-stpopts`
  - `on=mtprsi` - to enable the MTP Restart process, or `off=mtprsi` , to disable the MTP Restart process. When the `on=mtprsi` parameter is specified for the `chg-stpopts` command, the value `yes` is shown in the `MTPRSI` field of the `rtrv-stpopts` output. When the `off=mtprsi` parameter is specified for the `chg-stpopts` command, the value `no` is shown in the `MTPRSI` field of the `rtrv-stpopts` output. The system default value for this option is `no`.
  - `mtprsit` - the MTP restart isolation timer - 2000 to 900000 milliseconds. The system default value is 5000 milliseconds.

The MTP restart feature is applied to the signaling links in a linkset by specifying the `mtprse=yes` parameter of the `ent-ls` or `chg-ls` commands. Perform Adding an SS7 Linkset or Changing an SS7 Linkset to specify the `mtprse` value for a linkset.

If the **MTP** restart feature is turned on, the alignment of all signaling links is delayed until all the **LIMs** containing signaling links are in service. This allows the **EAGLE** to be restored to network service in an orderly fashion and allows all the **LIMs** containing signaling links to participate in the **MTP** restart process. The amount of time that the alignment of the signaling links is delayed is dependent on the number of **LIMs** and **DCMs** in the **EAGLE** and is shown in Table 3-8. Table 3-8 shows and example of **MTP** signaling link alignment delay for **LIMs**.

> **Note:**
>
> The **MTP** restart feature can be used on linksets containing non-**IP** signaling links, **IP** signaling links with the `ipliml2=m2pa` parameter, or IPSG signaling links with the `ipsg=yes` and `adapter=m2pa` parameters.

Table 3-8 MTP Restart Signaling Link Alignment Delay

Number of LIMs Containing Signaling Links	Signaling Link Alignment Delay
1 to 64	62 seconds
64 to 127	97 seconds
128 to 191	132 seconds
192 or more	167 seconds

If the **ANSI MTP** restart feature is on (`MTPRS = on` in the `rtrv-feat` command output), the `mtprsi` parameter is set to `yes`, and at least one **ANSI** linkset has the `mtprse` parameter set to `yes`, the **EAGLE** starts these level 3 timers; T22, T23, T24, T25, T26, T28, T29, and T30 to control the behavior of the **MTP** restart feature. These timers control when the **TRA** and **TRW** network management messages are sent to the nodes adjacent to the **EAGLE** when the **EAGLE** is going through the **MTP** restart process. When these timers are first introduced to the **EAGLE**, the system default values for these timers are:

- T22 - 10 seconds
- T23 - 10 seconds
- T24 - 10 seconds
- T25 - 30 seconds
- T26 - 12 seconds
- T28 - 3 seconds
- T29 - 60 seconds
- T30 - 30 seconds.

To change the values of these timers, perform Changing Level 3 Timers.

If the **ITU** MTP restart feature is on (`ITUMTPRS = on` in the `rtrv-feat` command output), the `mtprsi` parameter is set to `yes`, and at least one **ITU** linkset has the `mtprse` parameter set to `yes`, the **EAGLE** starts these level 3 timers; **IT18**, **IT19**, **IT20**, and **IT21** to control the behavior of the ITU MTP restart feature. These timers control when the **TRA** and **TRW** network management messages are sent to the nodes adjacent to the **EAGLE** when the **EAGLE** is going through the **MTP** restart process. When these timers are first introduced to the **EAGLE**, the default values for these timers are:

- **IT18** - 50 seconds
- **IT19** - 67 seconds
- **IT20** - 59 seconds
- **IT21** - 63 seconds.

To change the values of these timers, perform Changing Level 3 Timers.

If both the ANSI and ITU MTP restart features are on, the `mtprsi` parameter is set to `yes`, and at least one **ANSI** and **ITU** linkset has the `mtprse` parameter set to `yes`, the **EAGLE** starts the level 3 timers for both the ANSI and ITU MTP restart features to control the behavior of both the ANSI and ITU MTP restart features.

1. If you wish to use either the ANSI MTP restart feature or the ITU MTP restart feature, enter the `rtrv-feat` command to verify that either of these features are on.

   The entry `MTPRS = on` in the `rtrv-feat` command output shows that the **ANSI** MTP restart feature is on. The entry `ITUMTPRS = on` in the `rtrv-feat` command output shows that the **ITU MTP** restart feature is on. In this example, both features are off.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If both the **ANSI** and **ITU MTP** restart feature are on, continue the procedure with 4.

If you are not going to turn the ANSI **MTP** restart feature on, or if the output of the `rtrv-feat` command in this step shows that the ANSI **MTP** restart feature is on (shown by the `MPTRS = on` entry), continue the procedure with 3.

2. Turn the ANSI **MTP** restart feature on by entering this command.

   `chg-feat:mtprs=on`

   > **Note:**
   >
   > Once the ANSI **MTP** restart feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The ANSI **MTP** restart feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the ANSI **MTP** restart feature, contact your Sales Representative or Account Representative.

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
   CHG-FEAT: MASP A - COMPLTD
   ```

   > **Note:**
   >
   > If you are not going to turn the ITU**MTP** restart feature on, or if the output of the `rtrv-feat` command in 1 shows that the ITU **MTP** restart feature is on (shown by the `ITUMPTRS = on` entry), continue the procedure with 4.

3. Turn the ITU **MTP** restart feature on by entering this command.

   `chg-feat:itumtprs=on`

   > **Note:**
   >
   > Once the ITU **MTP** restart feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The ITU **MTP** restart feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the ITU **MTP** restart feature, contact your Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
CHG-FEAT: MASP A - COMPLTD
```

4. Enter the `rtrv-stpopts` command to display the value of the MTPRSI and MTPRSIT fields. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPRSI              no
MTPRSIT           5000
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

To change the value of the `MTPRSI` or the `MTPRSIT` fields, continue the procedure with 5.

If you do not wish to change the value of the `MTPRSI` or the `MTPRSIT` fields, continue the procedure with 7.

5. Change the MTPRSI or MTPRSIT values by entering the `chg-stpopts` command with one or more of these parameters.
   - `:on=mtprsi` - to enable the MTP restart process.
   - `:off=mtprsi` - to disable the MTP restart process.
   - `:mtprsit` - to specify a new value for the MTP restart isolation timer.

   For this example, enter this command.

   `chg-stpopts:on=mtprsi:mtprsit=7500`

   For this example, the MTP restart process is enabled and the value of the MTP restart isolation timer is changed.

   When the `chg-stpopts` command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

6. Verify the changes using the `rtrv-stpopts` command.

This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPRSI              yes
MTPRSIT            7500
```

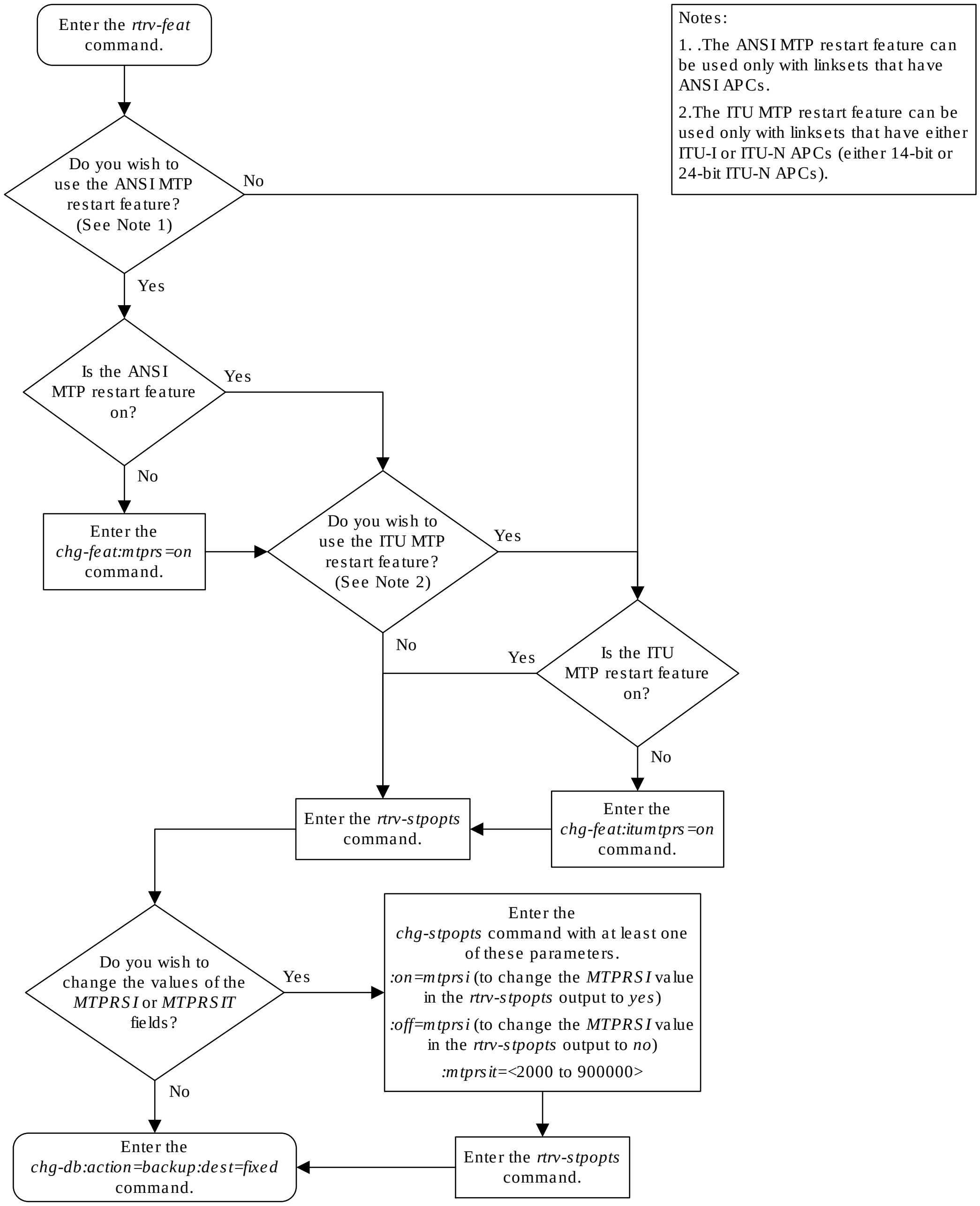
> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

7. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-6   Configuring the MTP Restart Feature



3.9 Configuring the 5-Bit to 8-Bit SLS Conversion Feature

This procedure is used to configure the 5-Bit to 8-Bit SLS Conversion feature using the `chg-stpopts` command with the `slscnv` parameter.

The slscnv parameter of the chg-stpopts command has three values: on, off, and perls.

- slscnv=on – 5-bit to 8-bit conversion is performed on all linksets in the **EAGLE**, regardless of what the value of the slsci parameter of the ent-ls or chg-ls command is for the specific linkset. If the asl8=yes parameter of either the ent-ls or chg-ls commands is assigned to the linkset, no **SLS** conversion is performed.
- slscnv=off – 5-bit to 8-bit conversion is not performed on the linksets in the **EAGLE**, regardless of what the value of the slsci parameter of the ent-ls or chg-ls command is for the specific linkset.
- slscnv=perls – 5-bit to 8-bit **SLS** conversion is only performed on the **MSUs** arriving at the **EAGLE** on linksets that have the asl8=no parameter assigned to them, and leaving the **EAGLE** on linksets that have the slsci=yes parameter assigned to them. The asl8 and slsci parameters are configured with either the ent-ls or chg-ls commands.

5-Bit to 8-Bit **SLS** conversion is performed based on the values assigned to the slsci and asl8 parameters for the linkset and the slscnv parameter of the chg-stpopts command.

> **Note:**
>
> The slsci and asl8 parameters can be specified only for linksets containing **ANSI** adjacent point codes.

The slsci parameter indicates whether the 5-bit to 8-bit SLS conversion feature is used to select signaling links for outgoing messages on the specified link set. If the slsci=yes parameter is specified, the EAGLE replaces any 5-bit **SLS** values contained in received messages with a random 8-bit value before they are used by the EAGLE to select the outgoing signaling link in that linkset. The 5-bit to 8-bit SLS conversion is also controlled by the slscnv parameter of the chg-stpopts command.

The asl8 parameter shows if the node adjacent to the EAGLE is sending MSUs with 8-bit SLSs. If the asl8=yes parameter is specified with the lst=a parameter (a linkset containing access signaling links), this indicates that the originator of the MSUs is generating 8-bit SLSs. For other linkset types, the asl8=yes parameter indicates that the adjacent node is converting 5-bit SLSs to 8-bit SLSs. The SLS in MSUs received by the EAGLE on a linkset that has the asl8=yes parameter assigned to it will not be converted. These MSUs are assumed to contain 8-bit SLSs. If the asl8=no parameter is specified for the linkset, the SLS will be converted to an 8-bit SLS. The value of the asl8 parameter is only displayed in the rtrv-ls command output when a specific linkset is being displayed with the rtrv-ls:lsn=<linkset name> command.

The interaction between the slsci and asl8 parameters of the ent-ls command and the slscnv parameter of the chg-stpopts command is shown in Table 3-9.

Table 3-9 Signaling Link Selector (SLS) Conversion (ANSI Linksets Only)

CHG-STPOPTSSLSCNV Parameter Value	Outgoing Linkset SLSCI Parameter Value	Incoming Linkset ASL8 Parameter Value	Result
ON	Not Applicable	**YES**	The adjacent node is sending 8-bit **SLSs**. No **SLS** conversion is performed on **MSUs** received on this linkset.
ON	Not Applicable	**NO**	The adjacent node is not sending 8-bit **SLSs**. 5-bit to 8-bit **SLS** conversion on **MSUs** received on this linkset.
OFF	Not Applicable	**YES**	The adjacent node is sending 8-bit **SLSs**. No **SLS** conversion is performed on any linksets.
OFF	Not Applicable	**NO**	The adjacent node is not sending 8-bit **SLSs**. 5-bit to 8-bit **SLS** conversion is not performed on all linksets.
PERLS*	**YES**	**YES**	The adjacent node is sending 8-bit **SLSs**. No **SLS** conversion is performed.
PERLS*	**YES**	**NO**	The adjacent node is not sending 8-bit **SLSs**. 5-bit to 8-bit **SLS** conversion is performed.
PERLS*	**NO**	**YES**	The adjacent node is sending 8-bit **SLSs**. No **SLS** conversion is performed.
PERLS*	**NO**	**NO**	The adjacent node is not sending 8-bit **SLSs**. 5-bit to 8-bit **SLS** conversion is not performed.

*When the `slscnv=perls` parameter is specified with the `chg-stpopts` command, 5-bit to 8-bit **SLS** conversion is only performed on the **MSUs** arriving at the **EAGLE** on linksets that have the `asl8=no` parameter of the `ent-ls` command assigned to them, and leaving the **EAGLE** on linksets that have the `slsci=yes` parameter of the `ent-ls` command assigned to them.

When a 5-bit ANSI SLS is converted to an 8-bit ANSI SLS, the three most significant bits of the **SLS** are set using a function of originating point code and incoming signaling link. This ensures that MSUs with the same originating point code, SLS, and incoming signaling link will always have the same SLS after the conversion, guaranteeing that the MSUs arrive at the destination in the same sequence that they were sent.

5-bit to 8-bit **SLS** conversion is performed under these conditions.

- The incoming linkset is an **ANSI** linkset, a linkset containing an **ANSI** adjacent point code.
- The `asl8=no` parameter of the `ent-ls` or `chg-ls` command is assigned to the incoming linkset.
- The outgoing linkset is an **ANSI** linkset.
- The `slscnv=on` parameter of the `chg-stpopts` command is specified
- The `slscnv=perls` parameter of the `chg-stpopts` command is specified and `slsci=yes` parameter of the `ent-ls` or `chg-ls` command assigned to the outgoing linkset.
- The three most significant bits of the **SLS** in the **MSU** are zero.

All **ANSI MSUs** originating from the EAGLE have an 8-bit SLS.

The EAGLE also converts ANSI SLSs to ITU SLSs, and ITU SLSs to ANSI SLSs.

When an ITU SLS is converted to an ANSI SLS, the ITU SLS is always converted to an ANSI 5-bit SLS. If the MSU containing the converted SLS is rerouted because of a link outage, the SLS may be converted from a 5-bit SLS to an 8-bit SLS.

When an ANSI SLS is converted to an ITU SLS, the ANSI SLS is always converted to an ITU 4-bit SLS.

The EAGLE does not convert a 4-bit ITU SLS to an 8-bit ANSI SLS.

The 5-bit to 8-bit SLS conversion takes place during the routing process, after the linkset is selected, but before the signaling link is selected. The ITU to ANSI SLS conversion takes place during the ANSI to ITU MSU conversion and after the outgoing signaling link is chosen.

1. Display the existing value for the `slscnv` parameter by entering the `rtrv-stpopts` command.

   The value for the `slscnv` parameter is shown in the `SLSCNV` field. This is an example of the possible output.

   ```
   rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0
   STP OPTIONS
   -----------------------
   SLSCNV              on
   ```

   > **Note:**
   >
   > The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

   If the `slscnv` parameter is not being changed, no further action is necessary. The procedure is finished.

If you wish to change the `slscnv` parameter value, continue the procedure with 2.

2. Change the `slscnv` parameter value using the `chg-stpopts` command.

   For this example, the value of the `slscnv` parameter is being changed from `on` to `perls`. Enter this command.`chg-stpopts:slscnv=perls`. When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-07 00:22:57 GMT  EAGLE5 40.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-stpopts` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0
STP OPTIONS
-----------------------
SLSCNV          perls
```

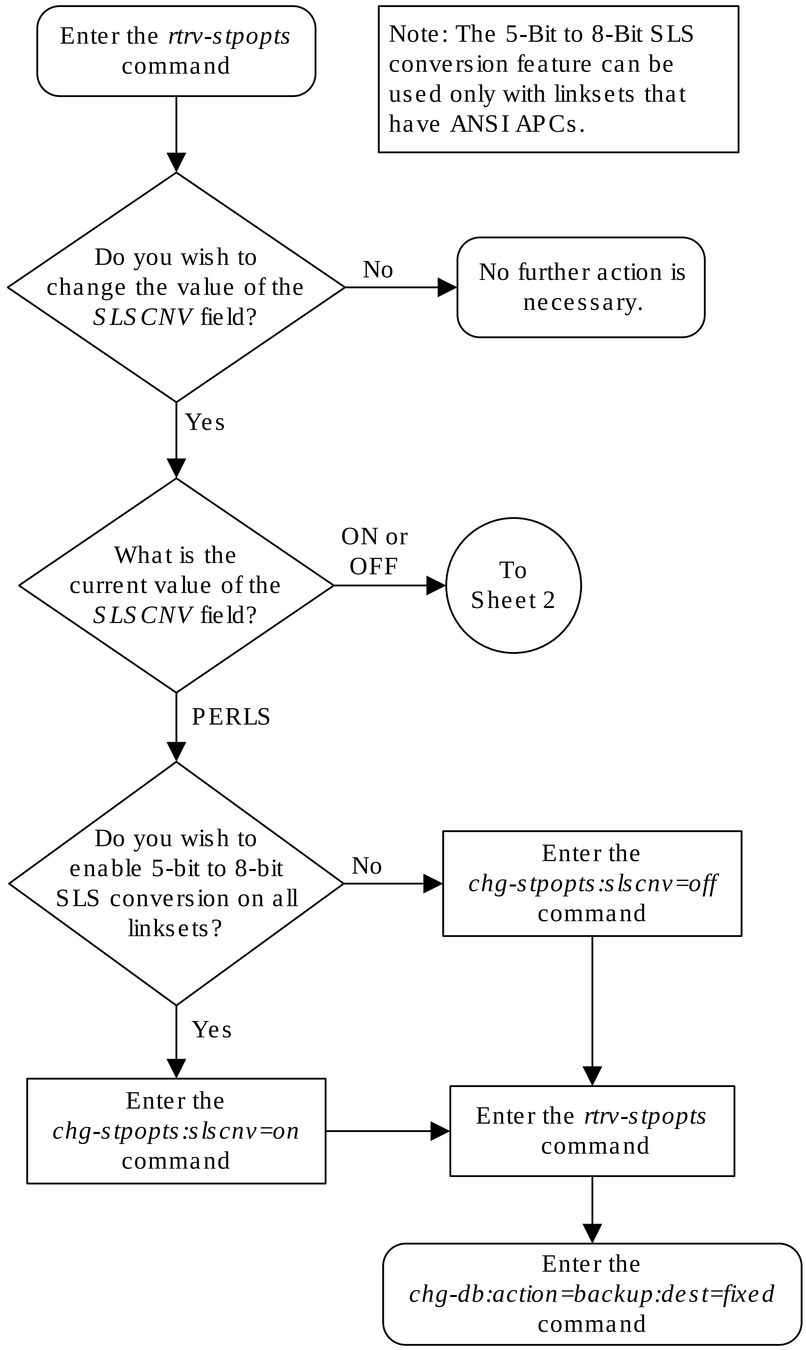
> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

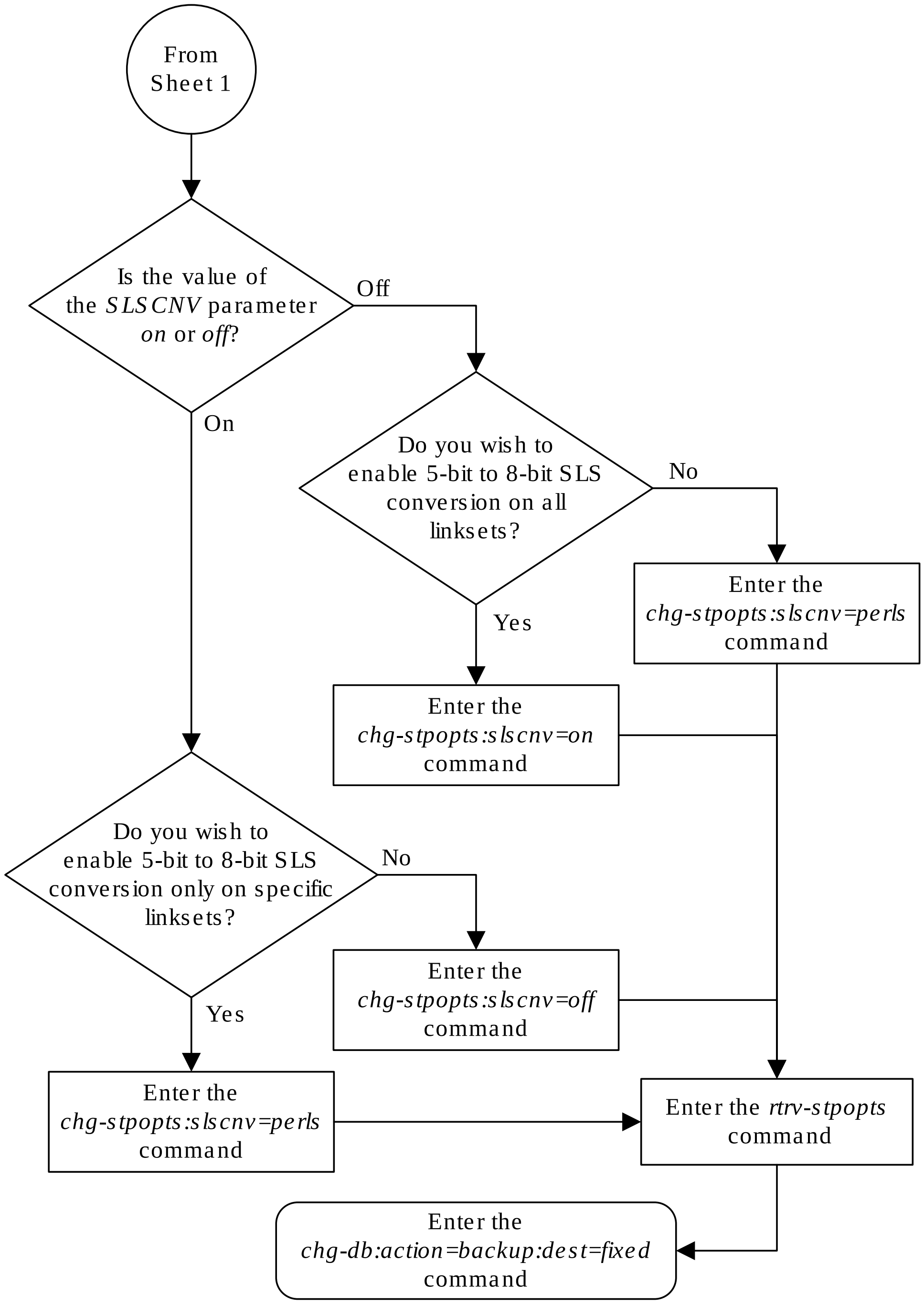
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-7 Configuring the 5-Bit to 8-Bit SLS Conversion Feature



Sheet 1 of 2


From Sheet 1
Is the value of the SLSCNV parameter on or off?
Off
On
Do you wish to enable 5-bit to 8-bit SLS conversion on all linksets?
No
Yes
Enter the chg-stpopts:slscnv=perls command
Enter the chg-stpopts:slscnv=on command
Do you wish to enable 5-bit to 8-bit SLS conversion only on specific linksets?
No
Yes
Enter the chg-stpopts:slscnv=off command
Enter the chg-stpopts:slscnv=perls command
Enter the rtrv-stpopts command
Enter the chg-db:action=backup:dest=fixed command

Sheet 2 of 2

3.10 Using Proxy Point Codes and Secondary Point Codes when Adding a Linkset

This procedure is used to verify that the following items are configured in the database.

- Proxy point codes for adding proxy linksets
- Secondary point codes for adding multiple linksets with the same adjacent point code.

To add a proxy linkset, a proxy point code must be assigned to the APC of the linkset, a proxy point code must be assigned to the linkset with the `ppc/ppca/ppci/ppcn/ppcn24` parameter, and the linkset type must be `prx`. A quantity of proxy point codes must be enabled with the `enable-ctrl-feat` command before a proxy point code and a proxy linkset can be added. The first time a proxy linkset is added, the proxy point code that is assigned to the linkset must be the same proxy point code that is assigned to the APC of the proxy linkset. A maximum of 10 linksets can be added using the same proxy point code. For more information on proxy point codes, refer to Proxy Point Codes.

To add more than one linkset with the same APC, the Multiple Linksets to Single Adjacent PC feature must be enabled and turned on. The database can contain a maximum of six linksets that have the same APC. If the linkset is not a proxy linkset (linkset types A, B, C, D, or E), a secondary point code (shown in the `rtrv-spc` output) must be specified with the linkset. The network type and format of the secondary point code must be the same as the APC of the linkset. Secondary point codes can also be assigned to the APC of the linkset when the point code is added in the database with the `ent-dstn` or `chg-dstn` commands. The secondary point code that is assigned to the linkset with the `spc/spca/spci/spcn/spcn24` parameter cannot be the same secondary point code that is assigned to the APC of the linkset.

If the linkset is a proxy linkset (linkset type PRX), a proxy point code (shown in the `rtrv-dstn` output) must be specified with the linkset. The proxy point code is assigned to the linkset with the `ppc/ppca/ppci/ppcn/ppcn24` parameter. The network type and format of the proxy point code must be the same as the APC of the linkset. If proxy linksets are added, the database must contain one proxy linkset with a proxy point code assigned to the APC of the linkset and the same proxy point code must be assigned to the linkset. The proxy point code that is assigned to the other proxy linksets using this APC cannot be the same as the proxy point code that is assigned to the APC of the linkset.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                   L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2           001-207-000    none 1   1   no  B   6    off off off no
off
ls1305         001-005-000    none 1   1   no  A   1    off off off no
off
```

```
ls1307        001-007-000   none 1   1   no  A   1    off off off
no    off
e1m1s1        001-001-003   none 1   1   no  A   7    off off off
no    off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off
no    off

                                 L3T SLT              GWS GWS GWS
LSN           APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i         1-207-0       none 1   1   no  B   4    off off off
---   on
ls1315        0-015-0       none 1   1   no  A   1    off off off
---   off
ls1317        0-017-0       none 1   1   no  A   1    off off off
---   on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off
---   off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off
---   off

Link set table is (10 of 1024) 1% full.
```

If the APC of the linkset is not being assigned to more than one linkset and a proxy linkset is being added, continue the procedure with 8.

If the APC of the linkset is not being assigned to more than one linkset, and a proxy linkset is not being added, this procedure is finished.

If the APC of the linkset is being assigned to more than one linkset, and multiple linksets with the same APC are shown in the `rtrv-ls` output in 1, continue the procedure with 3.

If the APC of the linkset is being assigned to more than one linkset, and multiple linksets with the same APC are not shown in the `rtrv-ls` output in 1, continue the procedure with 2.

2. Verify whether or not the Multiple Linksets to Single Adjacent PC feature is enabled and turned on by entering this command.

   `rtrv-ctrl-feat:partnum=893017901`

   This is an example of the possible output.

```
rlghncxa03w 08-12-21 15:48:20 EST  40.0.0
The following features have been permanently enabled:

Feature Name             Partnum   Status Quantity
Multiple Linkset to APC  893019701 on     ----


The following features have been temporarily enabled:

Feature Name             Partnum   Status Quantity   Trial Period
Left
Zero entries found.
```

```
The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the Multiple Linksets to Single Adjacent PC feature is not enabled or turned on, perform Activating the Multiple Linksets to Single Adjacent PC (MLS) Feature to enable and turn on this feature. After this feature has been enabled and turned on, continue the procedure with 3.

If the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, continue the procedure with 3.

3. Display the linksets that contain the APC for the new linkset by entering the `rtrv-ls` command with the APC of the linkset. For this example, enter this command.

   `rtrv-ls:apca=001-001-002`

   This is an example of the possible output.

```
rlghncxa03w 08-12-22 08:09:26 EST  40.0.0

APCA   =    001-001-002

                                L3T SLT              GWS GWS GWS
LSN           SPCA          SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1m1s2        020-020-021   none 1   1   no  A   7    off off off no
off

Link set table is (10 of 1024) 1% full.
```

   The maximum number of linksets that can use the same APC is six. If six linksets are shown in this step, the specified APC cannot be used with the new linkset. Select another APC from the `rtrv-ls` output in 1 and repeat this step.

   If one to five linksets are shown in this step and the linksets are proxy linksets (`lst=prx`), continue the procedure with 6.

   If one to five linksets are shown in this step and the linksets are not proxy linksets, continue the procedure with 4.

4. To use an APC for more than one linkset, a secondary point code must be assigned to the linkset. The secondary point code that will be assigned to the new linkset cannot be assigned to any of the linksets shown in 3.

   The secondary point code that will be assigned to the linkset cannot be assigned to the APC of this linkset. Verify this by entering the `rtrv-dstn` command with the APC of the linkset shown in 3. For this example, enter this command.

   `rtrv-dstn:dpca=001-001-002`

   This is an example of the possible output.

```
rlghncxa03w 10-12-22 08:09:26 EST  43.0.0
```

```
   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   001-001-002   ----------- no  --- ----------
--------------   SS7

   SPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   020-020-020  ---- no      none   off   none     no     no    none

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

If a secondary point code is shown in this step, this secondary point code cannot be assigned to the new linkset.

Continue the procedure with 5.

5. Display the secondary point codes by entering the `rtrv-spc` command. This is an example of the possible output.

```
rlghncxa03w 08-12-22 09:39:30 EST  40.0.0
SPC (Secondary Point Codes)

SPCA
     020-020-020
     020-020-021
     021-021-021
     022-022-022
     026-026-026
     026-026-027
     026-026-028
     026-026-029
     200-010-000

SPC-I

none

SPC-N
        00002

SPC-N24

none

Secondary Point Code table is (10 of 40) 25% full.
```

If the desired secondary point code is shown in this step, this procedure is finished.

If the desired secondary point code is not shown in this step, perform Adding a Secondary Point Code to add the desired secondary point code. The network type of the new secondary point code must be the same as the APC of the linkset. After the secondary point code has been added, this procedure is finished.

6. To use an APC for more than one proxy linkset, a proxy point code must be assigned to the linkset. The proxy point code that will be assigned to the new linkset cannot be assigned to any of the linksets shown in 3.

   The proxy point code that will be assigned to the linkset must be in the database. Verify the proxy point codes in the database by entering the `rtrv-dstn:prx=yes` command.

   This is an example of the possible output.

```
rlghncxa03w 09-05-22 08:09:26 EST  41.0.0

PRX = yes

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   002-002-002   ----------- no  --- ----------      --------------   SS7
   006-006-006   ----------- no  --- ----------      --------------   SS7
   050-050-050   ----------- no  --- ----------      --------------   SS7
   100-100-100   ----------- no  --- ----------      --------------   SS7
   100-100-101   ----------- no  --- ----------      --------------   SS7
   100-100-102   ----------- no  --- ----------      --------------   SS7
   100-100-103   ----------- no  --- ----------      --------------   SS7
   100-100-104   ----------- no  --- ----------      --------------   SS7
   200-001-001   ----------- no  --- ----------      --------------   SS7
   200-001-002   ----------- no  --- ----------      --------------   SS7

   DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24    DMN
   2-003-4       ----------- no  --- --------------  --------------   SS7

   DPCN          CLLI        BEI ELEI   ALIASA          ALIASI        DMN
   00003         ----------- no  --- --------------  ----------       SS7
   00004         ----------- no  --- --------------  ----------       SS7

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

   If the desired proxy point code is not shown in this step, perform Adding a Destination Point Code to add the desired proxy point code. The network type of the new proxy point code must be the same as the APC of the linkset. After the proxy point code has been added, this procedure is finished.

   If the desired proxy point code is shown in this step, continue the procedure with 7.

7. A proxy point code can be assigned to a maximum of 10 linksets. Verify how many linksets are using the proxy point code by entering the `rtrv-dstn` command with the proxy point code shown in 6. For this example, enter this command.

   `rtrv-dstn:dpca=002-002-002`

   This is an example of the possible output.

```
rlghncxa03w 10-12-22 10:08:11 EST  43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN
   002-002-002   ----------- no  --- ----------      --------------   SS7
```

```
   SPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   026-026-029  ---- yes, 1  none   off   none     no     no    none

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

The number of linksets using the proxy point code is the number shown in the `PRX` column. If 10 linksets are using the proxy point code, this proxy point code cannot be assigned to any other linkset. Repeat 6 and 7.

If the number of linksets using the proxy point code is from 0 to 9, this procedure is finished.

8. To add a proxy linkset, a linkset whose linkset type is `PRX`, a quantity of proxy point codes must be enabled. Verify whether or not a quantity of proxy point codes is enabled by entering the `rtrv-ctrl-feat` command.

> **Note:**
>
> If proxy linksets are shown in the `rtrv-ls` output in 1, then a quantity of proxy point codes has been enabled. If proxy linksets are shown in the `rtrv-ls` output in 1, this step does not have to be performed. Continue the procedure with 9.

This is an example of the possible output.

```
rlghncxa03w 08-12-22 10:58:06 EST  40.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
HC-MIM SLK Capacity       893012707 on     64
Origin-Based MTP Routing  893014201 on     ----
Multiple Linkset to APC   893019701 on     ----
Proxy Point Code          893018702 on     20


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If a quantity of proxy point codes is enabled, continue the procedure with 9.

If a quantity of proxy point codes is not enabled, perform Changing the Proxy Point Code Quantity to enable a quantity of proxy point codes. After the quantity of proxy point codes is enabled, perform Adding a Destination Point Code to add the desired proxy point code to the database, then assign the proxy point code to the destination point code that will be the APC of the proxy linkset. After Adding a Destination Point Code has been performed, this procedure is finished.

9. The APC of a proxy linkset must be a destination point code that contains a proxy point code. Verify the proxy point codes in the database by entering the `rtrv-dstn:prx=yes` command.

   This is an example of the possible output.

```
rlghncxa03w 09-05-22 08:09:26 EST  41.0.0

PRX = yes

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   002-002-002   ----------- no  --- ----------      --------------   SS7
   006-006-006   ----------- no  --- ----------      --------------   SS7
   050-050-050   ----------- no  --- ----------      --------------   SS7
   100-100-100   ----------- no  --- ----------      --------------   SS7
   100-100-101   ----------- no  --- ----------      --------------   SS7
   100-100-102   ----------- no  --- ----------      --------------   SS7
   100-100-103   ----------- no  --- ----------      --------------   SS7
   100-100-104   ----------- no  --- ----------      --------------   SS7
   200-001-001   ----------- no  --- ----------      --------------   SS7
   200-001-002   ----------- no  --- ----------      --------------   SS7

   DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24     DMN
   2-003-4       ----------- no  --- --------------  --------------   SS7

   DPCN          CLLI        BEI ELEI   ALIASA          ALIASI         DMN
   00003         ----------- no  --- --------------  ----------       SS7
   00004         ----------- no  --- --------------  ----------       SS7

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

10. Display the attributes of the proxy point that will be added to the proxy linkset by entering the `rtrv-dstn` command with a proxy point code shown in 9. For this example, enter this command.

    `rtrv-dstn:ppca=002-002-002`

    This is an example of the possible output.

```
rlghncxa03w 09-05-22 13:57:23 EST  41.0.0

PPCA    =    002-002-002

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   004-004-004   ----------- no  --- ----------      --------------   SS7
```

```
Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

If destination point codes are displayed in this step, continue the procedure with 11.

If destination are not shown in this step, then the proxy point code is not assigned to any destination point codes. Perform Adding a Destination Point Code to assign the proxy point code to a destination point code. The network type of the proxy point code must be the same as the APC of the linkset. After the proxy point code has been assigned to a destination point code, this procedure is finished.

11. A proxy point code can be assigned to a maximum of 10 linksets. Verify how many linksets are using the proxy point code by entering the `rtrv-dstn` command with the proxy point code shown in 10. For this example, enter this command.

    `rtrv-dstn:dpca=002-002-002`

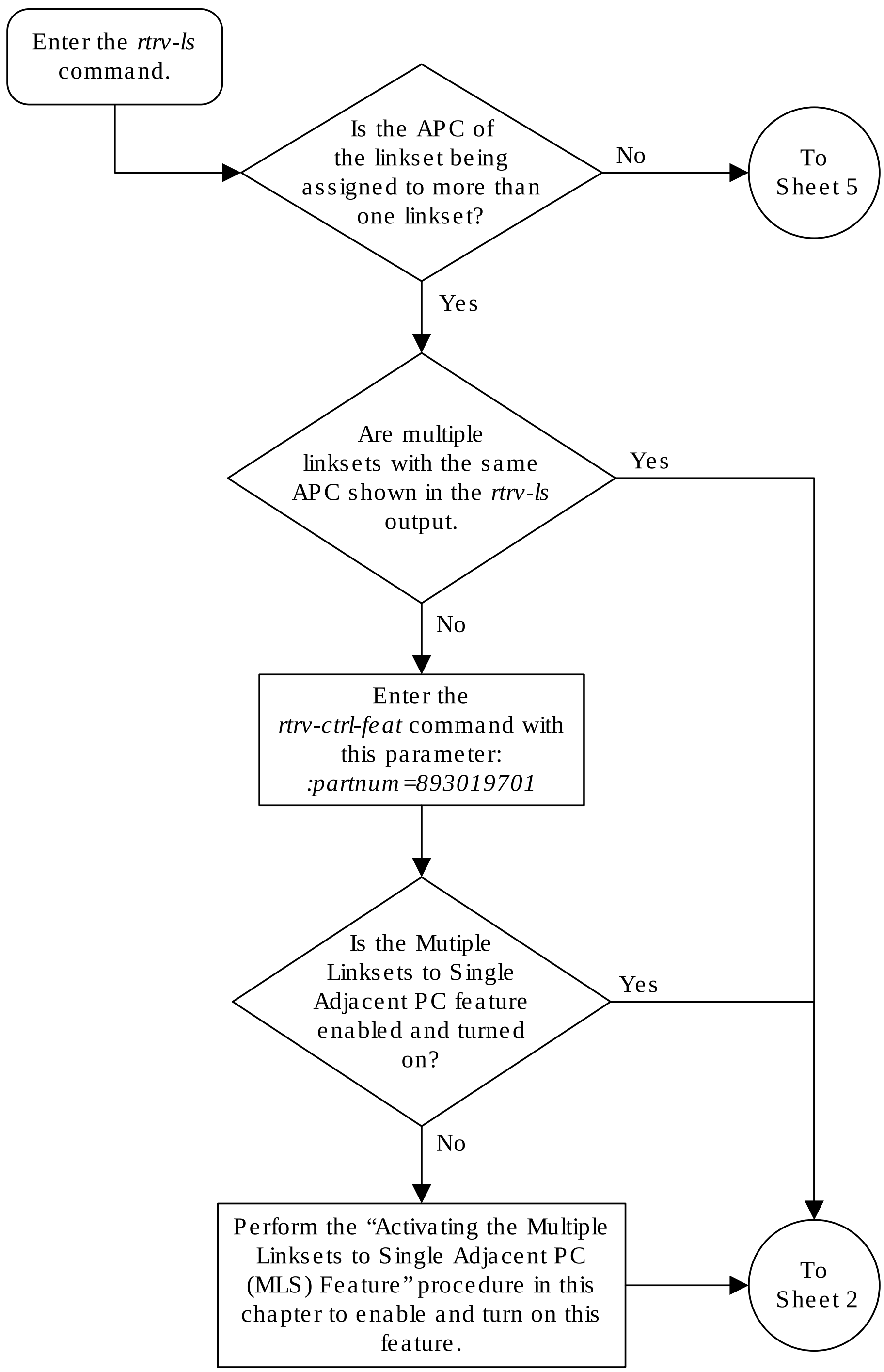
    This is an example of the possible output.

```
rlghncxa03w 10-12-22 10:08:11 EST  43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   002-002-002    ----------- no  --- ----------
--------------    SS7

   SPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   026-026-029   ---- yes, 1  none   off   none     no     no     none

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

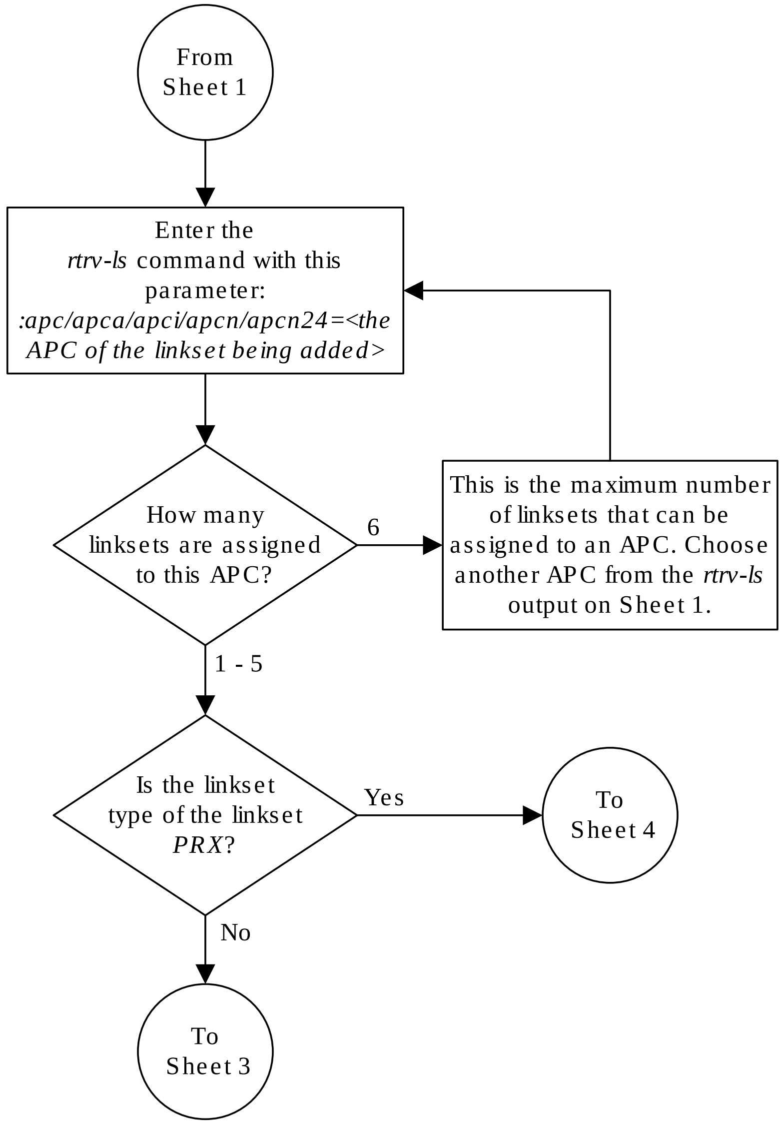
The number of linksets using the proxy point code is the number shown in the `PRX` column. If 10 linksets are using the proxy point code, this proxy point code cannot be assigned to any other linkset. Repeat 10 and 11.

If the number of linksets using the proxy point code is from 0 to 9, this procedure is finished.

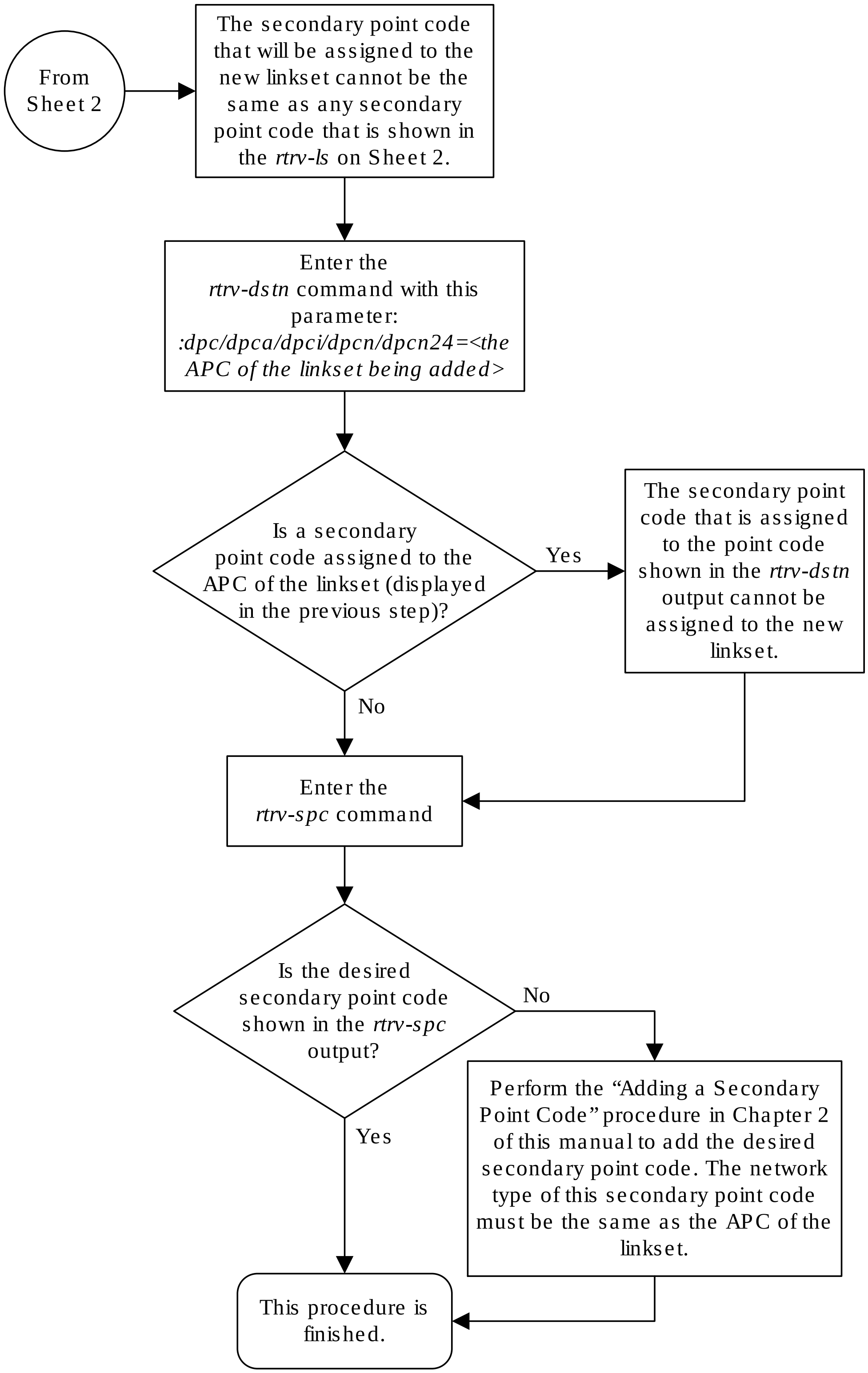
Figure 3-8 Using Proxy Point Codes and Secondary Point Codes when Adding a Linkset



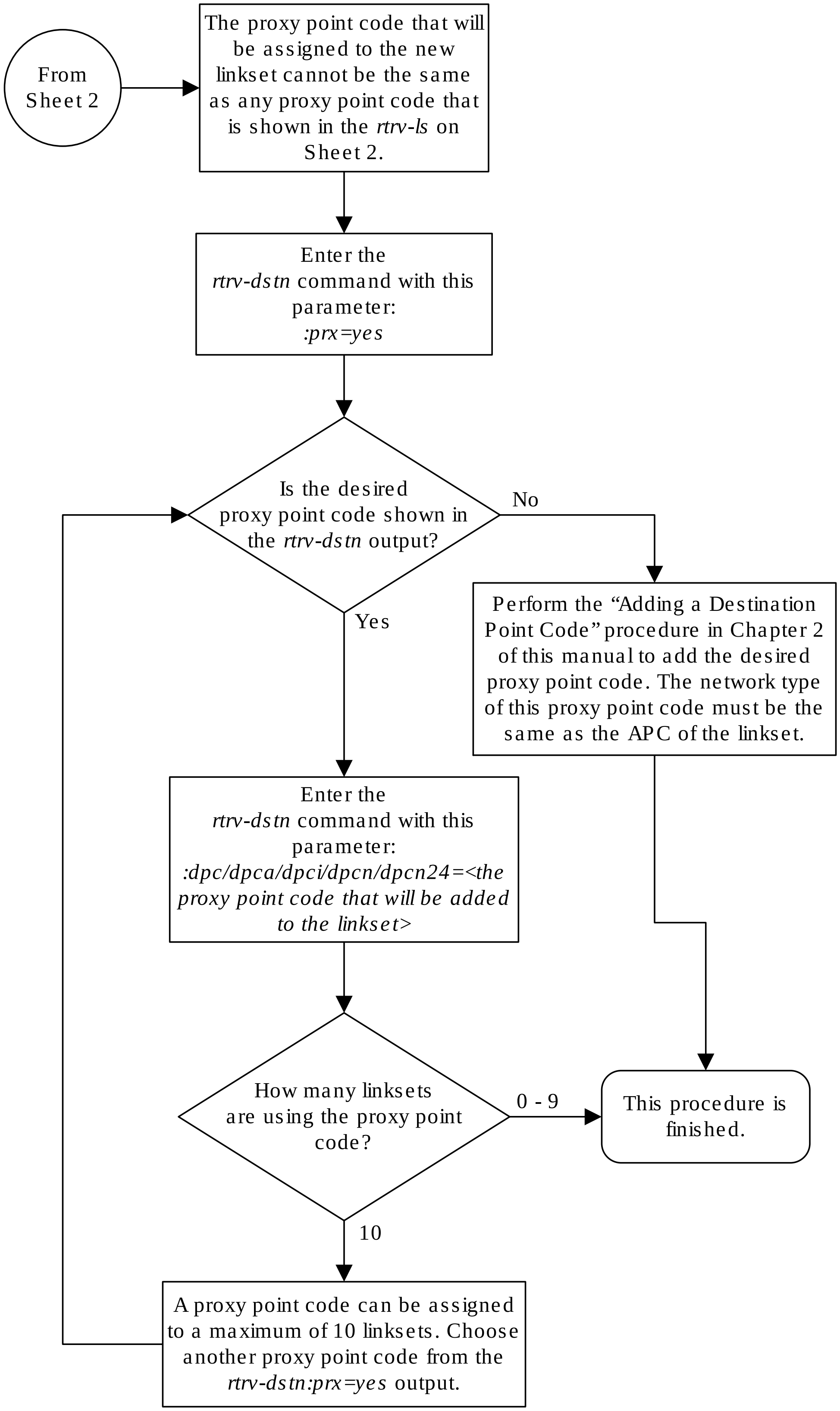
Sheet 1 of 7


From Sheet 1
Enter the rtrv-ls command with this parameter: :apc/apca/apci/apcn/apcn24=<the APC of the linkset being added>
How many linksets are assigned to this APC?
6
This is the maximum number of linksets that can be assigned to an APC. Choose another APC from the rtrv-ls output on Sheet 1.
1 - 5
Is the linkset type of the linkset PRX?
Yes
To Sheet 4
No
To Sheet 3

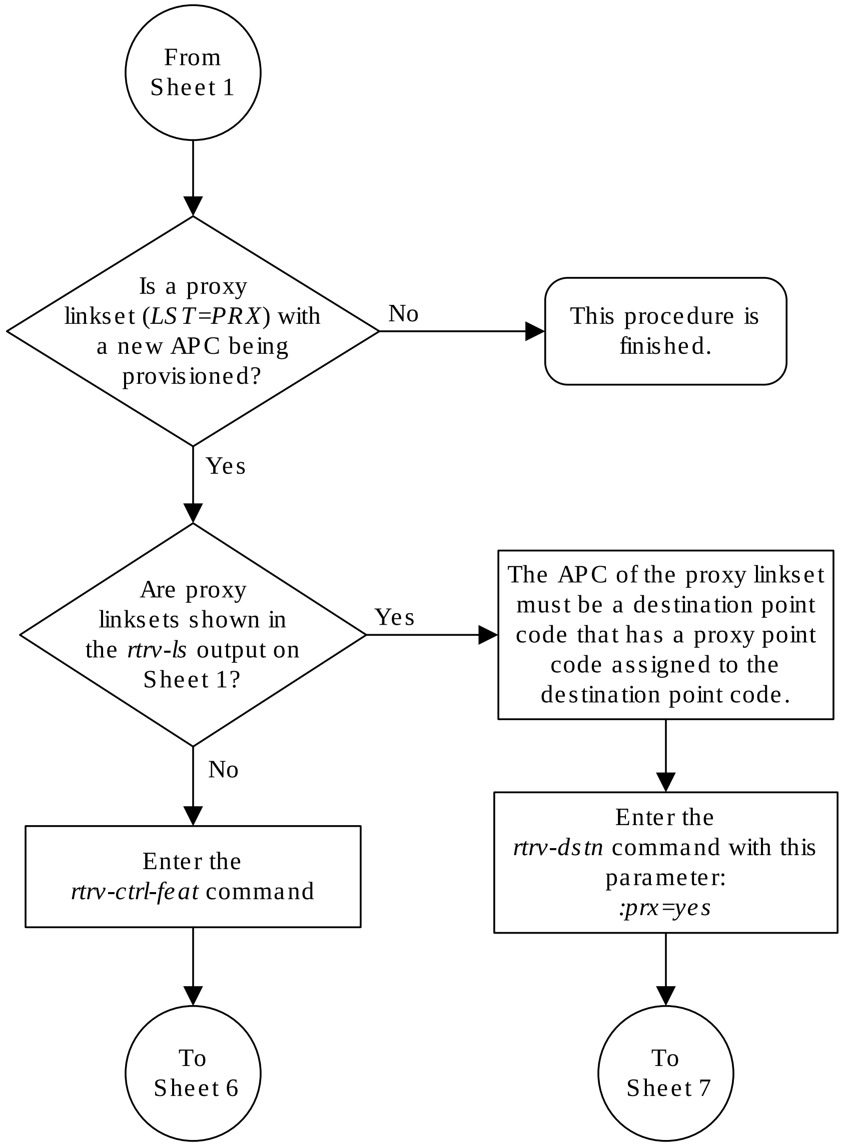
Sheet 2 of 7


From Sheet 2
The secondary point code that will be assigned to the new linkset cannot be the same as any secondary point code that is shown in the *rtrv-ls* on Sheet 2.
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca/dpci/dpcn/dpcn24=<the APC of the linkset being added>*
Is a secondary point code assigned to the APC of the linkset (displayed in the previous step)?
Yes
The secondary point code that is assigned to the point code shown in the *rtrv-dstn* output cannot be assigned to the new linkset.
No
Enter the *rtrv-spc* command
Is the desired secondary point code shown in the *rtrv-spc* output?
No
Perform the “Adding a Secondary Point Code” procedure in Chapter 2 of this manual to add the desired secondary point code. The network type of this secondary point code must be the same as the APC of the linkset.
Yes
This procedure is finished.

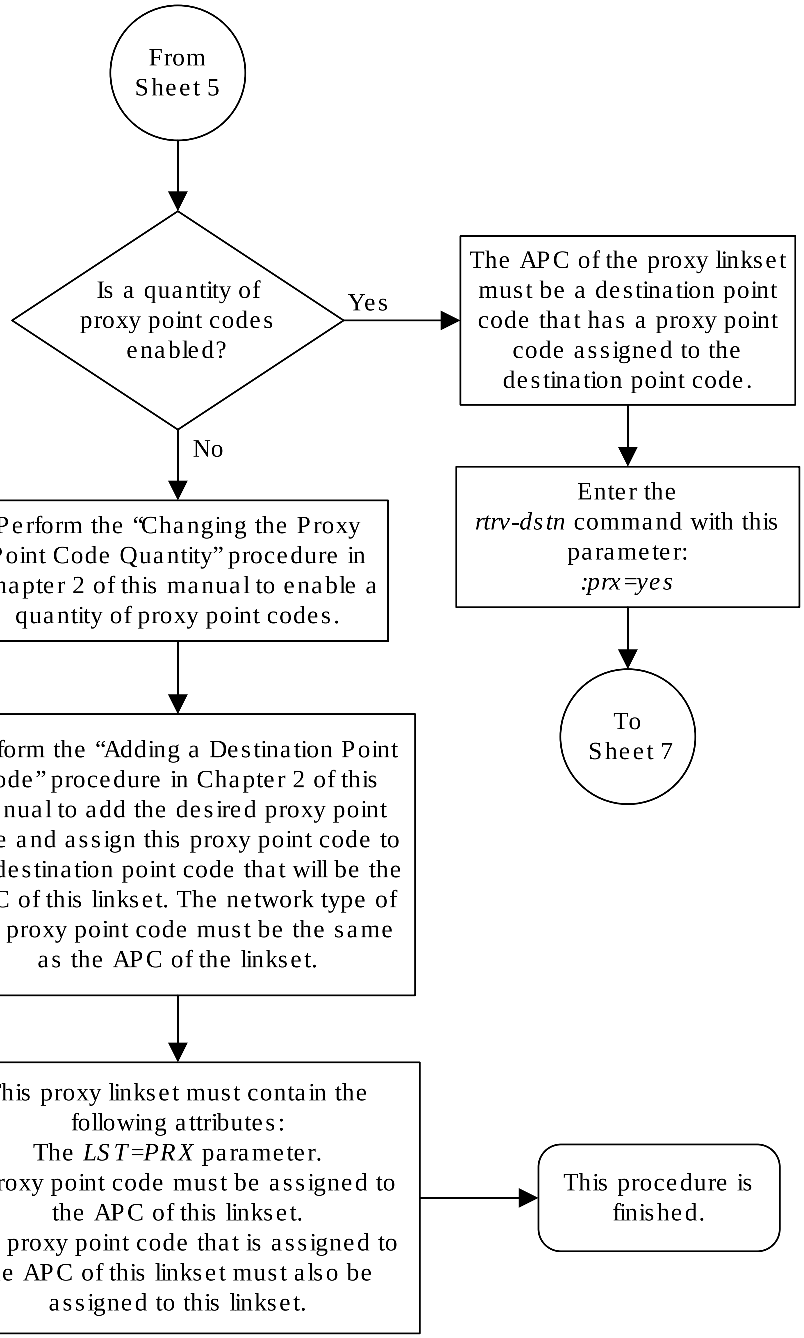
Sheet 3 of 7


From Sheet 2
The proxy point code that will be assigned to the new linkset cannot be the same as any proxy point code that is shown in the *rtrv-ls* on Sheet 2.
Enter the *rtrv-dstn* command with this parameter: *:prx=yes*
Is the desired proxy point code shown in the *rtrv-dstn* output?
No
Yes
Perform the “Adding a Destination Point Code” procedure in Chapter 2 of this manual to add the desired proxy point code. The network type of this proxy point code must be the same as the APC of the linkset.
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca/dpci/dpcn/dpcn24=<the proxy point code that will be added to the linkset>*
How many linksets are using the proxy point code?
0 - 9
This procedure is finished.
10
A proxy point code can be assigned to a maximum of 10 linksets. Choose another proxy point code from the *rtrv-dstn:prx=yes* output.

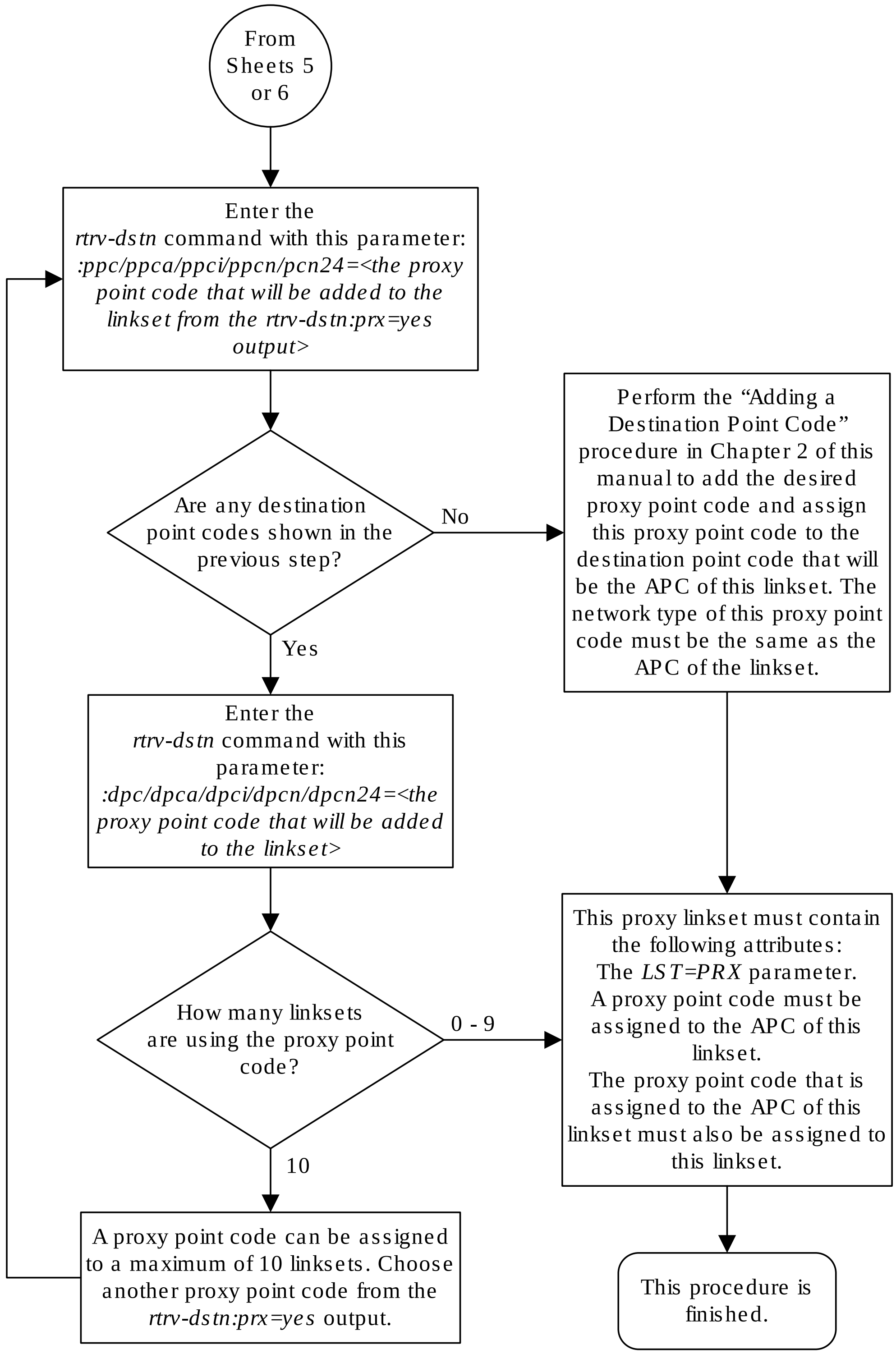
Sheet 4 of 7


From Sheet 1
Is a proxy linkset (LST=PRX) with a new APC being provisioned?
No
This procedure is finished.
Yes
Are proxy linksets shown in the rtrv-ls output on Sheet 1?
Yes
The APC of the proxy linkset must be a destination point code that has a proxy point code assigned to the destination point code.
No
Enter the rtrv-ctrl-feat command
Enter the rtrv-dstn command with this parameter: :prx=yes
To Sheet 6
To Sheet 7

Sheet 5 of 7


From Sheet 5
Is a quantity of proxy point codes enabled?
Yes
No
The APC of the proxy linkset must be a destination point code that has a proxy point code assigned to the destination point code.
Enter the *rtrv-dstn* command with this parameter: *:prx=yes*
To Sheet 7
Perform the "Changing the Proxy Point Code Quantity" procedure in Chapter 2 of this manual to enable a quantity of proxy point codes.
Perform the "Adding a Destination Point Code" procedure in Chapter 2 of this manual to add the desired proxy point code and assign this proxy point code to the destination point code that will be the APC of this linkset. The network type of this proxy point code must be the same as the APC of the linkset.
This proxy linkset must contain the following attributes:
The *LST=PRX* parameter.
A proxy point code must be assigned to the APC of this linkset.
The proxy point code that is assigned to the APC of this linkset must also be assigned to this linkset.
This procedure is finished.

Sheet 6 of 7


From Sheets 5 or 6
Enter the *rtrv-dstn* command with this parameter: *:ppc/ppca/ppci/ppcn/pcn24=<the proxy point code that will be added to the linkset from the rtrv-dstn:prx=yes output>*
Are any destination point codes shown in the previous step?
No
Yes
Perform the "Adding a Destination Point Code" procedure in Chapter 2 of this manual to add the desired proxy point code and assign this proxy point code to the destination point code that will be the APC of this linkset. The network type of this proxy point code must be the same as the APC of the linkset.
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca/dpci/dpcn/dpcn24=<the proxy point code that will be added to the linkset>*
How many linksets are using the proxy point code?
0 - 9
10
This proxy linkset must contain the following attributes: The *LST=PRX* parameter. A proxy point code must be assigned to the APC of this linkset. The proxy point code that is assigned to the APC of this linkset must also be assigned to this linkset.
A proxy point code can be assigned to a maximum of 10 linksets. Choose another proxy point code from the *rtrv-dstn:prx=yes* output.
This procedure is finished.

Sheet 7 of 7

3.11 Activating the SLS Bit Rotation by Incoming Linkset Feature

This procedure is used to enable and turn on the SLS Bit Rotation by Incoming Linkset feature using the feature's part number and a feature access key.

The feature access key for the SLS Bit Rotation by Incoming Linkset feature is based on the features part number and the serial number of the EAGLE, making the feature access key site-specific.

The `enable-ctrl-feat` command enables the feature by inputting the feature access key and the feature part number with these parameters:

`:fak` – The feature access key provided by Oracle.

`:partnum` – The Oracle-issued part number of the SLS Bit Rotation by Incoming Linkset feature, 893026501.

Once this feature is enabled, it is permanently enabled. This feature cannot be enabled with a temporary feature access key.

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the SLS Bit Rotation by Incoming Linkset feature, 893026501.

`:status=on` – used to turn the SLS Bit Rotation by Incoming Linkset feature on.

Once the SLS Bit Rotation by Incoming Linkset feature has been turned on, it cannot be turned off.

The status of the SLS Bit Rotation by Incoming Linkset feature is shown with the `rtrv-ctrl-feat` command.

1. Display the controlled features in the database by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
SCCP Conversion           893012001  on      ----
EIR                       893012301  on      ----
GSM Map Screening (GMS)   893013201  on      ----
HC-MIM SLK Capacity       893012707  on      64


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the SLS Bit Rotation by Incoming Linkset feature is enabled, the entry `ISLSBR` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the SLS Bit Rotation by Incoming Linkset feature is on, no further action can be performed.

   If the SLS Bit Rotation by Incoming Linkset feature is enabled but not turned on, continue the procedure with 7.

   If the SLS Bit Rotation by Incoming Linkset feature is not enabled, continue the procedure by performing one of these steps.

   - If the `rtrv-ctrl-feat` output in 1 shows any controlled features in addition to the HC-MIM SLK Capacity feature with a quantity of 64, continue the procedure with 6.
   - If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, continue the procedure with 2.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
System serial number = nt00001231
```

```
System serial number is not locked.

rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
Command Completed
```

Continue the procedure by performing one of these actions.

- If the serial number is correct and locked, continue the procedure with 6.
- If the serial number is correct but not locked, continue the procedure with 5.
- If the serial number is not correct, but is locked, the SLS Bit Rotation by Incoming Linkset feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
   System serial number = nt00001231

   System serial number is not locked.

   rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
   Command Completed
   ```

   If the serial number was not entered correctly, repeat 3 and 4 to re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Enable the SLS Bit Rotation by Incoming Linkset feature by entering the `enable-ctrl-feat` command. For this example, enter this command.

   `enable-ctrl-feat:partnum=893026501:fak= <SLS Bit Rotation by Incoming Linkset feature access key>`

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the SLS Bit Rotation by Incoming Linkset feature, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

7. Turn the SLS Bit Rotation by Incoming Linkset feature on by entering the `chg-ctrl-feat` command with the part number used in 6 and the `status=on` parameter.

   For this example, enter this command.

   `chg-ctrl-feat:partnum=893026501:status=on`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

8. Verify the changes by entering this command.

   `rtrv-ctrl-feat:partnum=893026501`

   The following is an example of the possible output.

```
rlghncxa03w 08-12-28 11:43:04 GMT EAGLE5 40.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
ISLSBR                    893026501  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
```

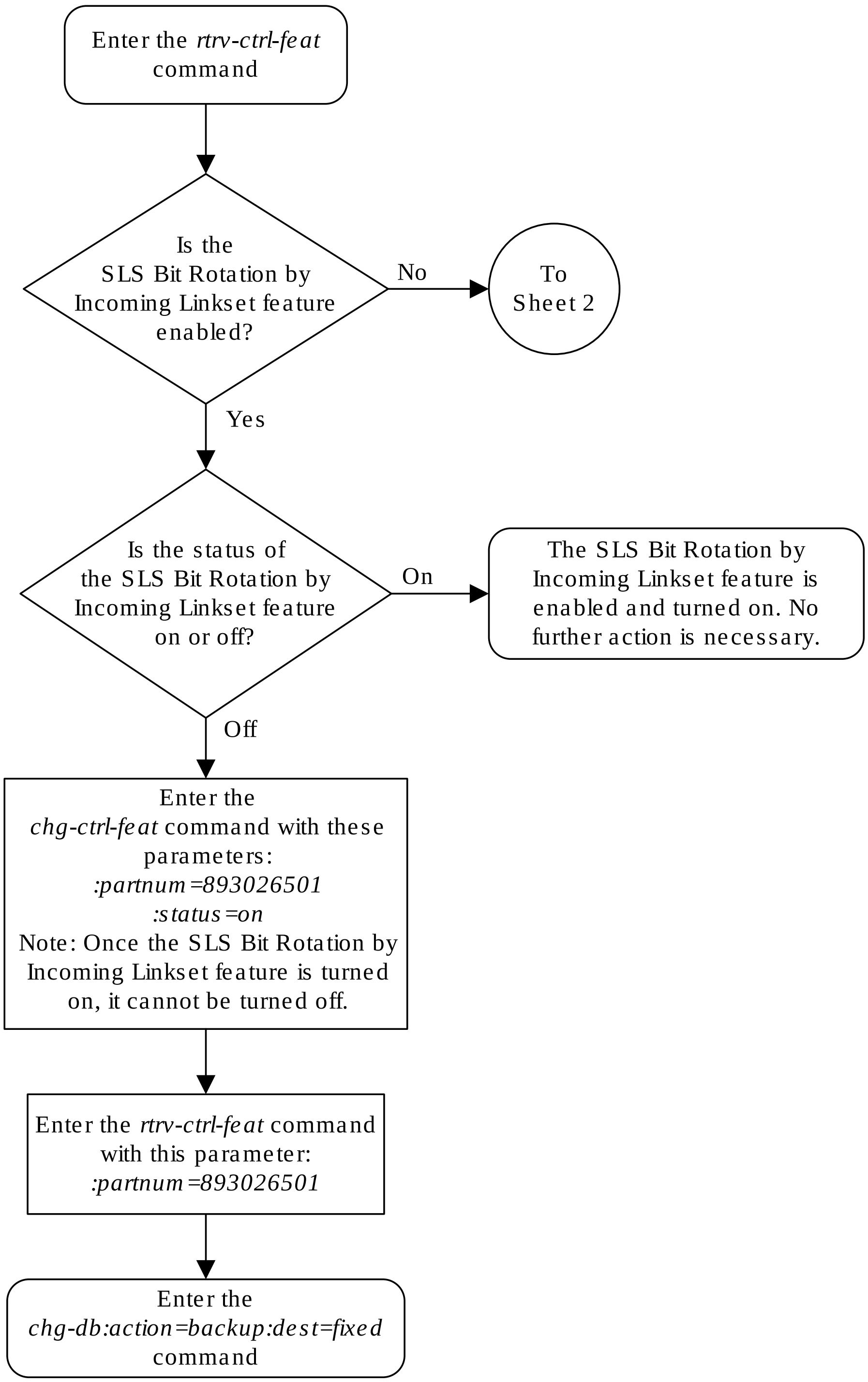
```
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

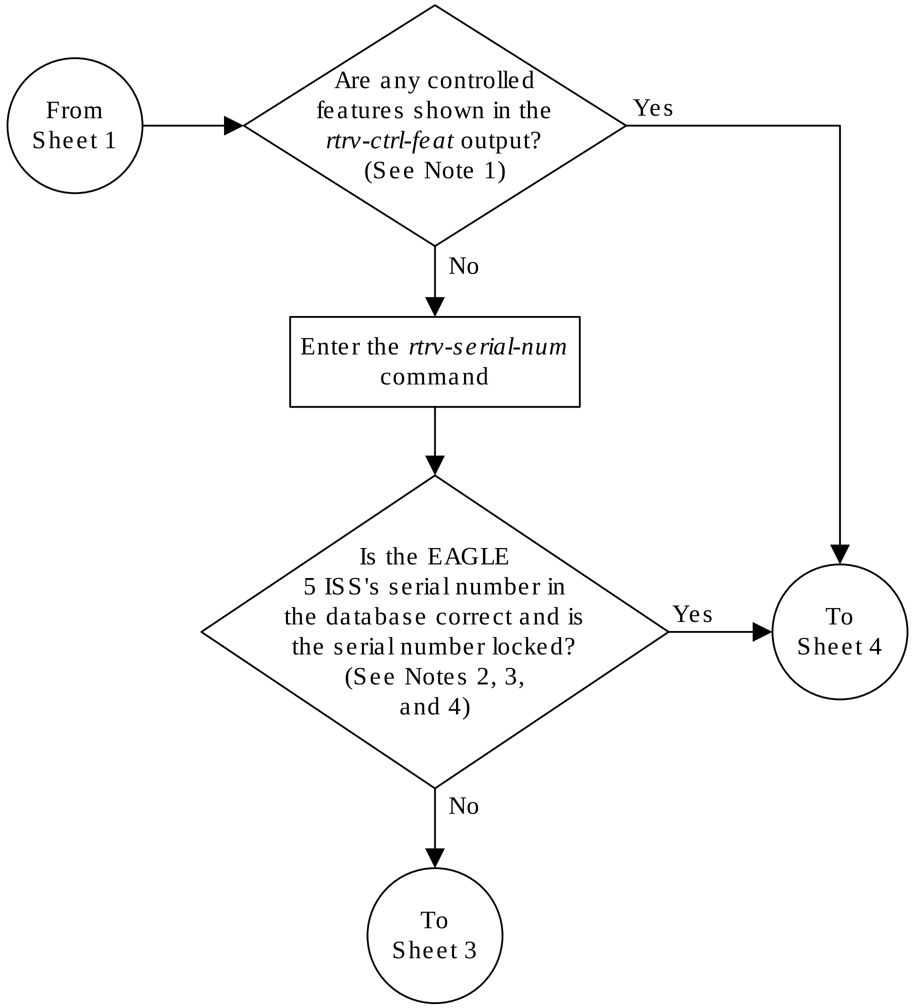
   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-9 Activating the SLS Bit Rotation by Incoming Linkset Feature



Sheet 1 of 4



Notes:

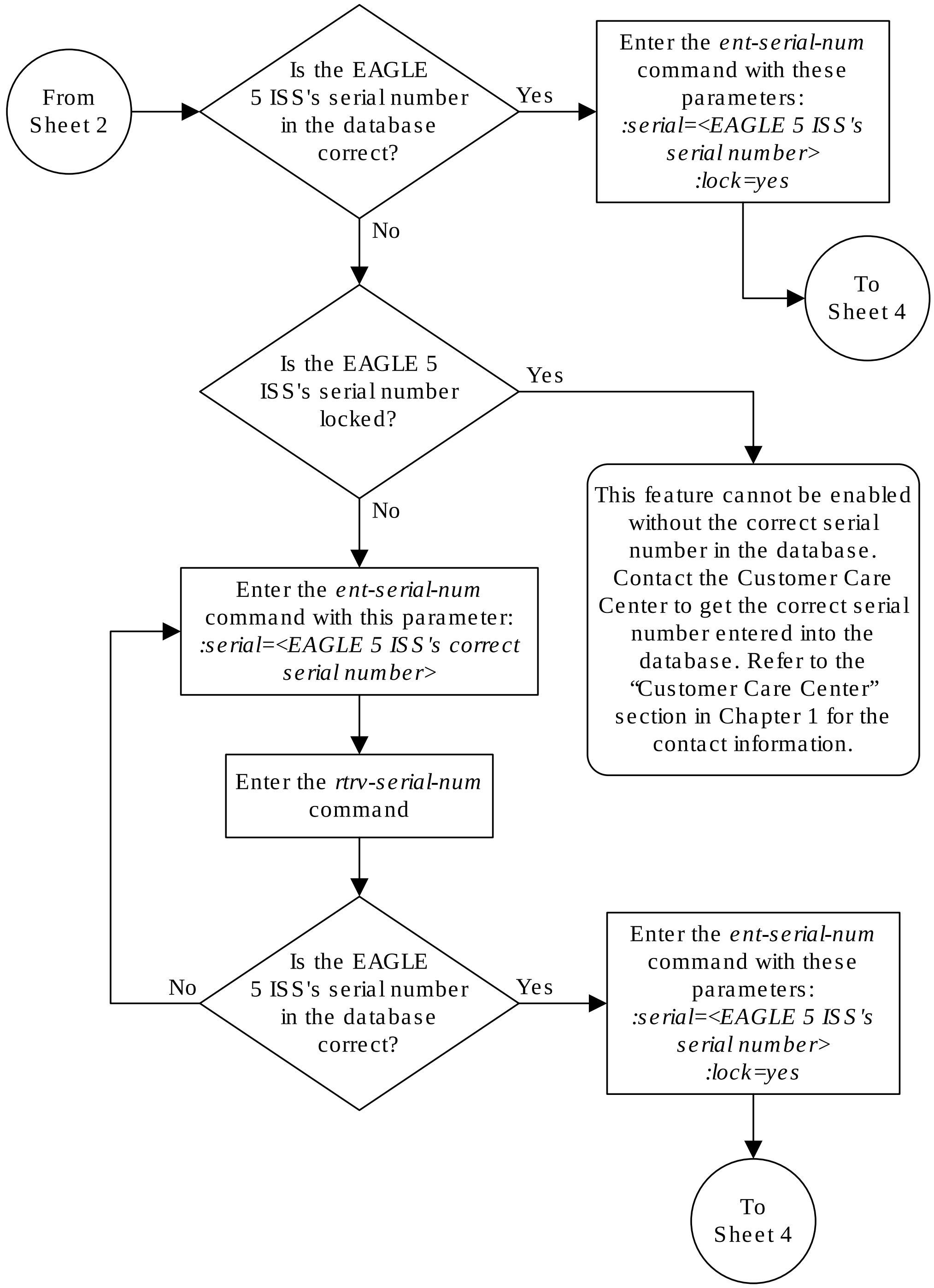
1. If the *rtrv-ctrl-feat* output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the answer to this question is no and the Eagle 5 ISS's serial number must be verified. This is the default entry for the *rtrv-ctrl-feat* output. This entry is shown whether or not the Eagle 5 ISS's serial number is in the database.

2. If the serial number is locked, it cannot be changed.

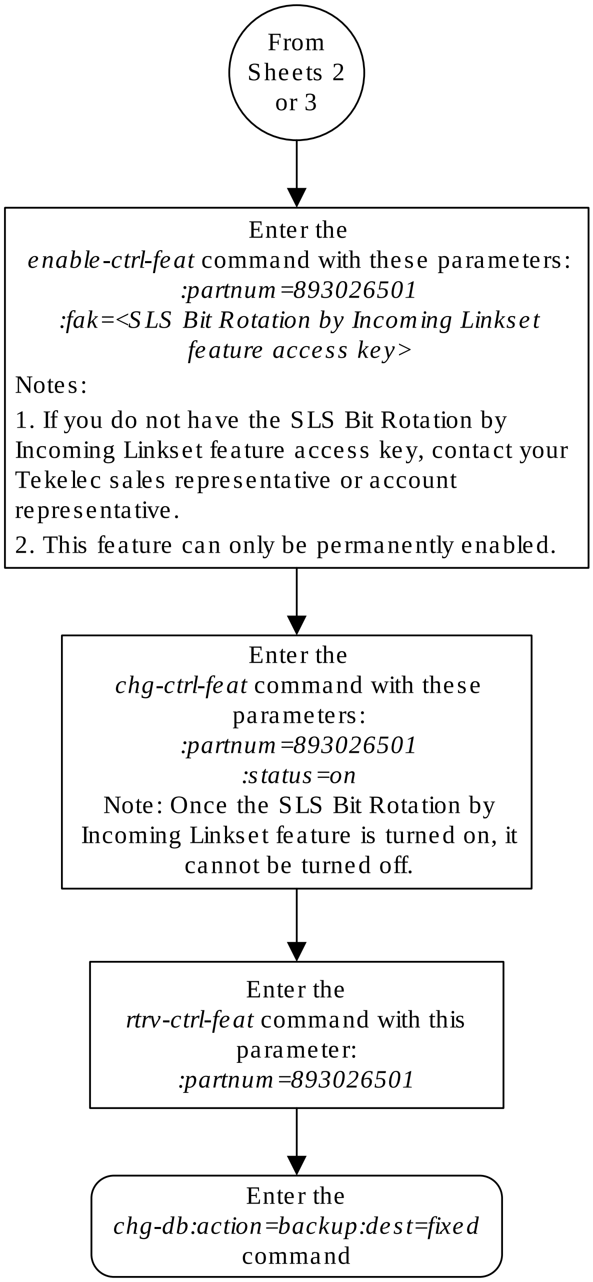
3. If the serial number is not locked, the controlled feature cannot be enabled.

4. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Sheet 2 of 4


From Sheet 2
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
Enter the *ent-serial-num* command with these parameters:
:serial=<EAGLE 5 ISS's serial number>
:lock=yes
To Sheet 4
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the *ent-serial-num* command with this parameter:
:serial=<EAGLE 5 ISS's correct serial number>
Enter the *rtrv-serial-num* command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the *ent-serial-num* command with these parameters:
:serial=<EAGLE 5 ISS's serial number>
:lock=yes
To Sheet 4

Sheet 3 of 4


From Sheets 2 or 3
Enter the *enable-ctrl-feat* command with these parameters:
:partnum=893026501
:fak=<SLS Bit Rotation by Incoming Linkset feature access key>
Notes:
1. If you do not have the SLS Bit Rotation by Incoming Linkset feature access key, contact your Tekelec sales representative or account representative.
2. This feature can only be permanently enabled.
Enter the *chg-ctrl-feat* command with these parameters:
:partnum=893026501
:status=on
Note: Once the SLS Bit Rotation by Incoming Linkset feature is turned on, it cannot be turned off.
Enter the *rtrv-ctrl-feat* command with this parameter:
:partnum=893026501
Enter the *chg-db:action=backup:dest=fixed* command

Sheet 4 of 4

3.12 Configuring the RSLS8 Value for ANSI Linksets

This procedure is used to configure the RSLS8 value for ANSI linksets feature using the `chg-lsopts` command with the `lsn` and `rsls8` parameters.

The `rsls8` parameter specifies how many bits of the SLS for messages on ANSI linksets are considered for bit rotation. The `rsls8` parameter of the `chg-lsopts` command has two values.

- `yes` - 8 bits of the SLS are considered for bit rotation.
- `no` - 5 bits of the SLS are considered for bit rotation.

The `lsn` parameter specifies the name of the linkset that is being changed, specified in either Adding an SS7 Linkset or Changing an SS7 Linkset.

The `rsls8` parameter can be specified only if the SLS Bit Rotation by Incoming Linkset feature is enabled. Perform Activating the SLS Bit Rotation by Incoming Linkset Feature to enable the SLS Bit Rotation by Incoming Linkset feature.

The value of the `rsls8` parameter is shown in the `RSLS8` column of the `rtrv-ls` output. The `RSLS8` column is shown when the `lsn` parameter is specified with the `rtrv-ls` command, and is displayed only for ANSI linksets.

Refer to ITU SLS Enhancement for information on how the `rsls8` parameter value is used with SLS bit rotation.

1. Display the `RSLS8` value of the linkset that is being changed by entering the `rtrv-ls` with the name of the ANSI linkset that is being changed. For this example, enter this command

   `rtrv-ls:lsn=atmansi1`

   This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                              L3T SLT              GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
atmansi1     200-050-176    scr1 1   9   no  a   0    on  off off
no    off

             SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
         ---------------- rlghncccc001  1          no     no

         RANDSLS
         off

         ISLSRSB RSLS8
         1       no

         IPSG  IPGWAPC  GTTMODE          CGGTMOD
```

```
          no     no        CdPA                 no

Link set table is ( 20 of 1024)  2% full
```

If the RSLS8 column is not shown in the rtrv-ls output, the SLS Bit Rotation by Incoming Linkset feature is not enabled. Perform Activating the SLS Bit Rotation by Incoming Linkset Feature to enabled the SLS Bit Rotation by Incoming Linkset feature. After the SLS Bit Rotation by Incoming Linkset feature is enabled, the RSLS8 value for the linkset is set to no.

If you do not wish to change the RSLS8 value for the linkset, this procedure does not need to be performed.

If you wish to change the RSLS8 value, continue the procedure with 2.

2. Change the rsls8 parameter value using the chg-lsopts command.

   If the current RSLS8 value is no, for this example, enter this command

   `chg-lsopts:lsn=atmansi1:rsls8=yes`

   If the current RSLS8 value is yes, for this example, enter this command

   `chg-lsopts:lsn=atmansi1:rsls8=no`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 09-05-07 00:22:57 GMT  EAGLE5 41.0.0
CHG-LSOPTS: MASP A - COMPLTD
```

3. Verify the changes by entering the rtrv-ls command with the name of the linkset that was specified in 3.

   `rtrv-ls:lsn=atmansi1`

   This is an example of the possible output.

```
rlghncxa03w 09-05-17 11:43:04 GMT EAGLE5 41.0.0

                               L3T SLT              GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI NIS
atmansi1     200-050-176    scr1 1   9   no  a   0    on  off off no    off

             SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
          ---------------- rlghnccc001  1          no     no

          RANDSLS
          off

          ISLSRSB RSLS8
          1        yes

          IPSG  IPGWAPC  GTTMODE           CGGTMOD
          no    no       CdPA                no
```

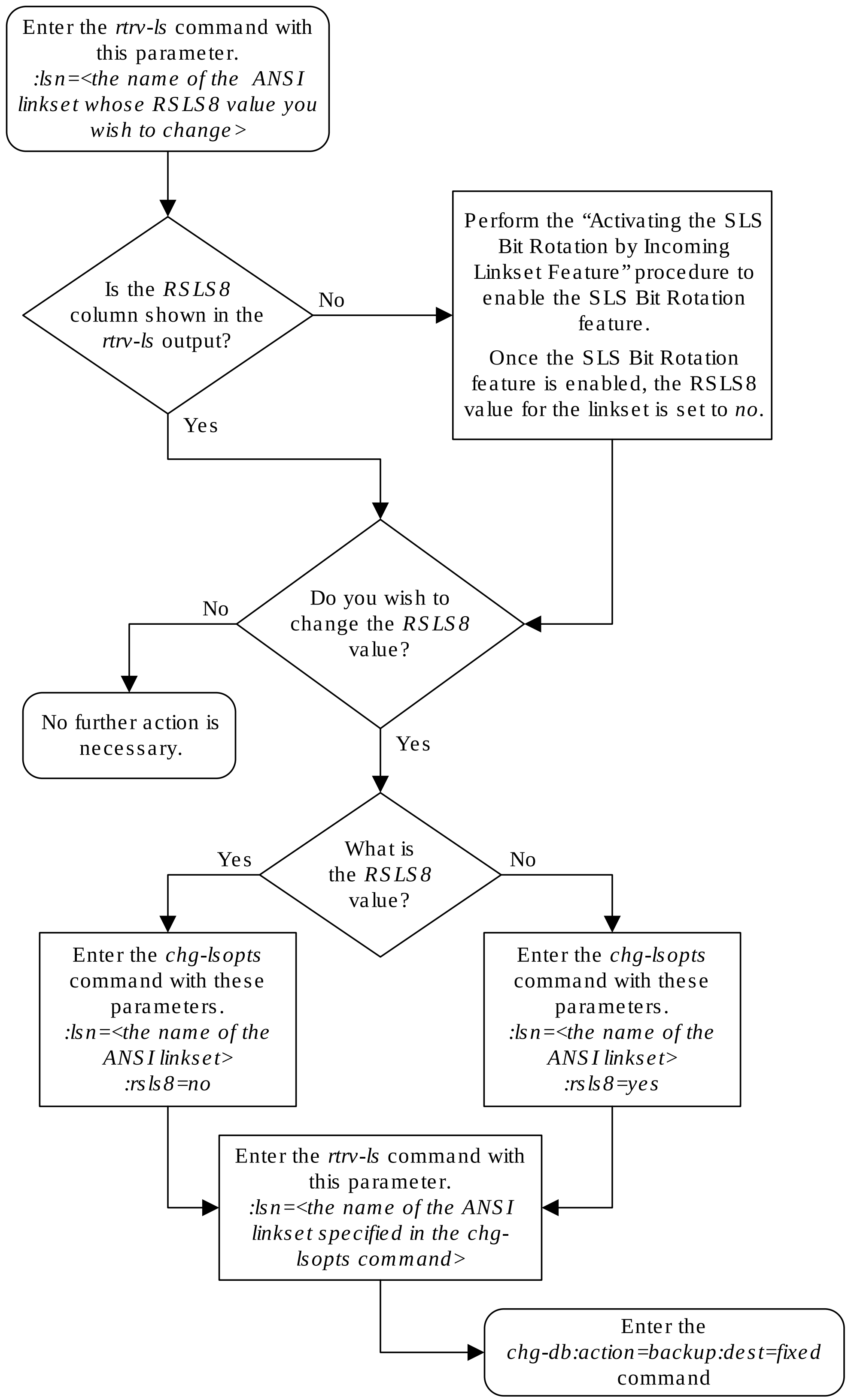
```
Link set table is ( 20 of 1024)  2% full
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-10 Configuring the RSLS8 Value for ANSI Linksets



3.13 Removing a Linkset Containing SS7 Signaling Links

This procedure is used to remove a linkset containing **SS7** signaling links from the database using the `dlt-ls` command.

The `dlt-ls` command has only one parameter, `lsn`, which is the name of the linkset to be removed from the database.

The linkset to be removed must exist in the database.

To remove a linkset, all links associated with the linkset must be removed.

The linkset to be removed cannot be referenced by a routeset.

If the Flexible Linkset Optional Based Routing feature is enabled and turned on, and the linkset is referenced by a GTT selector, the linkset cannot be removed.

To remove an **IPGWx** linkset, a linkset containing signaling links assigned to cards running either the **SS7IPGW** or **IPGWI** applications, the **IPGWx** linkset cannot be the mate of another IPGWx linkset.

A proxy linkset whose APC is assigned to more than one proxy linkset cannot be removed if the linkset contains the proxy point code (shown in the `PPCA/PPCI/PPCN/PPCN24` field in the `rtrv-ls:apc/apca/apci/apcn/apcn24=<APC of the linkset>` output) that is also assigned to the APC of the linkset. The proxy point code assigned to the APC of the linkset is shown in the `rtrv-dstn:dpc/dpca/dpci/dpcn/dpcn24=<APC of the linkset>` output. The linksets that do not contain the proxy point code that is assigned to the APC of the linkset must be removed before the linkset containing proxy point code that is assigned to the APC of the linkset can be removed.

Canceling the `RTRV-LS` Command

Because the `rtrv-ls` command used in this procedure can output information for a long period of time, the `rtrv-ls` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` command was entered, from another terminal other that the terminal where the `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current linkset configuration using the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2          001-207-000   none 1   1   no  B   6    off off off no
off
ls1           240-012-004   scr1 1   1   yes a   4    off off off yes
off
ls1305        000-005-000   none 1   1   no  A   1    off off off no
off
ls1307        000-007-000   none 1   1   no  A   1    off off off no
off
e1m1s1        001-001-001   none 1   1   no  A   7    off off off no
off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off no
off
lsgw1103      003-002-004   none 1   1   no  A   1    off off off no
off
lsn150        150-001-002   none 1   1   no  PRX 1    off off off no
off
lsn151        150-001-002   none 1   1   no  PRX 1    off off off no
off

                                 L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none 1   1   no  B   4    off off off ---    on
ls1315        0-015-0       none 1   1   no  A   1    off off off ---
off
ls1317        0-017-0       none 1   1   no  A   1    off off off ---    on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off ---
off

Link set table is (14 of 1024) 1% full.
```

If the linkset being removed is a proxy linkset (`LST=PRX`), and more than one linkset is shown in the `rtrv-ls` output that contains the APC of the linkset being removed, continue the procedure with 2.

If the linkset being removed is not a proxy linkset, or is a proxy linkset whose APC is not used by more than one linkset, continue the procedure with 4.

2. Display the linksets that contain the APC of the linkset being removed by entering the `rtrv-ls` command with the APC of the linkset. For this example, enter this command.

```
rtrv-ls:apca=150-001-002
```

This is an example of the possible output.

```
rlghncxa03w 07-08-23 11:09:57 EST  37.0.0

APCA    =    150-001-002

                                     L3T SLT                GWS GWS GWS
LSN            PPCA           SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn150         150-001-001    none 1    1    no   PRX 1     off off off
no     off
lsn151         150-001-004    none 1    1    no   PRX 1     off off off
no     off


Link set table is (14 of 1024) 1% full.
```

3. Display the attributes of the APC of the linkset being removed by entering the `rtrv-dstn` command with the APC of the linkset. For this example, enter this command.

   `rtrv-dstn:dpca=150-001-002`

   This is an example of the possible output.

```
Oraclestp 10-12-15 09:22:39 EST  43.0.0

   DPCA           CLLI         BEI ELEI   ALIASI
ALIASN/N24     DMN
   150-001-002    ----------- no  --- ----------
--------------    SS7

   PPCA          NCAI PRX      RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   150-001-001   ---- no       none   off   none     no     no     none

Destination table is (14 of 2000) 1% full
Alias table is (0 of 12000) 0% full
PPC table is (2 of 10) 20% full
```

   A proxy linkset whose APC is assigned to more than one proxy linkset cannot be removed if the linkset contains the proxy point code (shown in the `PPCA/PPCI/PPCN/PPCN24` field in 2) that is also assigned to the APC of the linkset (shown in 3). The linksets that do not contain the proxy point code that is assigned to the APC of the linkset must be removed before the linkset containing proxy point code that is assigned to the APC of the linkset can be removed.

4. Display the signaling links in that linkset being removed using the `rtrv-ls` command, specifying the linkset name of the linkset you wish to remove from the database. For this example, enter these commands.

   `rtrv-ls:lsn=ls1`

This is an example of the possible output.

```
tekelecstp 18-01-22 05:31:51 EST  EAGLE 46.6.0.0.0-71.21.0

                                    L3T SLT              GWS GWS GWS
    LSN          APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
    ls1          003-003-003   gws1  1   1   no  A   15   on  on  on
yes   off

                  SPCA          CLLI          TFATCABMLQ MTPRSE ASL8
               ---------------- -----------   7          no     no

               RANDSLS
               off

               IPSG  GTTMODE            CGGTMOD
               no    CdPA                no

                                     LP          ATM
               LOC  LINK SLC TYPE     SET BPS    TSEL      VCI   VPI  LL
               1102 A    2   LIMATM   1   1.544M EXTERNAL 5     0    0

               LOC  LINK SLC TYPE     IPLIML2
               1201 A    5   IPLIM    M2PA

                                     L2T                PCR  PCR   E1   E1
               LOC  LINK SLC TYPE     SET  BPS    ECM   N1   N2    LOC
PORT TS
               1205 A    6   LIME1    1    56000  BASIC ---  ----- 1205
1    1

                                     L2T                PCR  PCR   T1   T1
               LOC  LINK SLC TYPE     SET  BPS    ECM   N1   N2    LOC
PORT TS
               1206 A    10  LIMT1    1    56000  BASIC ---  ----- 1206
1    1

    Link set table is (7 of 1024) 1% full.
```

```
rtrv-ls:lsn=lsgw1103
```

This is an example of the possible output.

```
rlghncxa03w 07-05-17 11:43:04 GMT EAGLE5 37.0.0

                                L3T SLT              GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsgw1103       003-002-004   none 1   1   no  A   1    off off off no
off
```

```
           SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          no     no


           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           yes     ---------  10000 70     % 70      % CdPA

           LOC  LINK SLC TYPE
           1103 A    0   SS7IPGW

Link set table is ( 14 of 1024)  1% full
```

```
rtrv-ls:lsn=lsn151
```

This is an example of the possible output.

```
rlghncxa03w 09-07-23 13:10:34 EST  41.1.0

                                L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn151        150-001-002   none 1   1   no  PRX 1    off off off
no    off

              PPCA          CLLI         TFATCABMLQ MTPRSE ASL8
              150-001-004   -----------  1          no     no

           IPGWAPC MATELSN    IPTPS  LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ----   ---      ---       CdPA

                                L2T               PCR   PCR
           LOC  LINK SLC TYPE     SET  BPS    ECM   N1    N2
           2105 A     0  LIMDS0   1    56000  BASIC ---   ---

Link set table is (14 of 1024) 1% full.
```

5. Display the routes in the database by using the `rtrv-rte` command, specifying the name of the linkset you wish to remove. For this example, enter these commands.

```
rtrv-rte:lsn=ls1
```

This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
LSN           DPC
RC
ls1           240-012-004   10
```

```
rtrv-rte:lsn=lsgw1103
```

This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
LSN            DPC
RC
lsgw1103       003-002-004   10
```

`rtrv-rte:lsn=lsn151`

This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0
LSN            DPC
RC
lsn151         150-001-002   10
```

If any routes reference the linkset to be removed, remove these routes by performing the Removing a Route procedure.

6. Deactivate the signaling links in the linkset using the `dact-slk` command. For this example, enter these commands.

   `dact-slk:loc=1205:link=b`

   `dact-slk:loc=1207:link=b`

   `dact-slk:loc=1211:link=a`

   `dact-slk:loc=1213:link=b`

   `dact-slk:loc=1103:link=a`

   `dact-slk:loc=2105:link=a`

   When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 08:41:12 GMT  EAGLE5 37.0.0
Deactivate Link message sent to card
```

7. Verify that the linkset is out-of-service maintenance disabled (**OOS-MT-DSBLD**) using the `rept-stat-ls` command, specifying the linkset name. For this example, enter these commands.

   `rept-stat-ls:lsn=ls1`

   This is an example of the possible output.

```
rlghncxa03w 07-05-23 13:35:08 GMT EAGLE5 37.0.0
LSN           APCA           PST           SST       AST
ls1           240-012-004    OOS-MT-DSBLD  Prohibit  -----
  SPCA    = ----------------
  ALARM STATUS       = No Alarms
  SCRSET  = scr1
  GWSA    = ----
```

```
  GWSM    = ----
  GWSD    = ----
  SLC SLK     SST          SLC SLK     SST
  0   1205,B  Unavail       8   ----,-  UEQ
  1   1213,B  Unavail       9   ----,-  UEQ
  2   1211,A  Unavail      10   ----,-  UEQ
  3   1207,B  Unavail      11   ----,-  UEQ
  4   ----,-  UEQ          12   ----,-  UEQ
  5   ----,-  UEQ          13   ----,-  UEQ
  6   ----,-  UEQ          14   ----,-  UEQ
  7   ----,-  UEQ          15   ----,-  UEQ
Command Completed.
```

`rept-stat-ls:lsn=lsgw1103`

This is an example of the possible output.

```
rlghncxa03w 07-05-23 13:35:08 GMT EAGLE5 37.0.0
LSN           APCA           PST           SST       AST
lsgw1103      003-002-004    OOS-MT-DSBLD  Prohibit  -----
  SPCA    = ----------------
  ALARM STATUS       = No Alarms
  SCRSET  = scr1
  GWSA    = ----
  GWSM    = ----
  GWSD    = ----
  SLC SLK     SST          SLC SLK     SST
  0   1103,A  Unavail       8   ----,-  UEQ
  1   ----,-  UEQ           9   ----,-  UEQ
  2   ----,-  UEQ          10   ----,-  UEQ
  3   ----,-  UEQ          11   ----,-  UEQ
  4   ----,-  UEQ          12   ----,-  UEQ
  5   ----,-  UEQ          13   ----,-  UEQ
  6   ----,-  UEQ          14   ----,-  UEQ
  7   ----,-  UEQ          15   ----,-  UEQ
Command Completed.
```

`rept-stat-ls:lsn=lsn151`

This is an example of the possible output.

```
rlghncxa03w 07-05-23 13:35:08 GMT EAGLE5 37.0.0
LSN           APCA           PST           SST       AST
lsn151        150-001-002    OOS-MT-DSBLD  Prohibit  -----
  PPCA   =    150-001-004
  ALARM STATUS       = No Alarms
  SCRSET  = ----
  GWSA    = ----
  GWSM    = ----
  GWSD    = ----
  SLC SLK     SST          SLC SLK     SST
  0   2105,A  Unavail       8   ----,-  UEQ
  1   ----,-  UEQ           9   ----,-  UEQ
```

```
  2   ----,-  UEQ         10   ----,-  UEQ
  3   ----,-  UEQ         11   ----,-  UEQ
  4   ----,-  UEQ         12   ----,-  UEQ
  5   ----,-  UEQ         13   ----,-  UEQ
  6   ----,-  UEQ         14   ----,-  UEQ
  7   ----,-  UEQ         15   ----,-  UEQ
Command Completed.
```

8. If any signaling links in the linkset are the last signaling link on a card, the card must be placed out of service before that signaling link can be removed. Verify this by entering the `rtrv-slk` command and specifying each of the card locations shown in the output of 4. Do not specify the `link` parameter. For this example, enter these commands.

   `rtrv-slk:loc=1205`

   This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:17:04 GMT EAGLE5 41.1.0
                                   L2T                 PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1205  B    ls1           0  LIMDS0    1    56000  BASIC ---   -----
```

   `rtrv-slk:loc=1207`

   This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:17:04 GMT EAGLE5 41.1.0
                                   L2T                 PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1207  A    ls3           1  LIMDS0    1    56000  BASIC ---   -----
1207  B    ls1           3  LIMDS0    1    56000  BASIC ---   -----
```

   `rtrv-slk:loc=1211`

   This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0
                                   L2T                 PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1211  A    ls1           2  LIMDS0    1    56000  BASIC ---   -----
1211  B    ls2           0  LIMDS0    1    56000  BASIC ---   -----
```

   `rtrv-slk:loc=1213`

   This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:17:04 GMT EAGLE5 41.1.0
                                   L2T                 PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1213  A    ls2           1  LIMDS0    1    56000  BASIC ---   -----
1213  B    ls1           1  LIMDS0    1    56000  BASIC ---   -----
```

```
rtrv-slk:loc=1103
```

This is an example of the possible output.

```
rlghncxa03w 07-05-19 21:17:04 GMT EAGLE5 37.0.0
LOC   LINK LSN          SLC TYPE
1103 A    lsn1           0  SS7IPGW
```

```
rtrv-slk:loc=2105
```

This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:17:04 GMT EAGLE5 41.1.0
                                   L2T                PCR  PCR
LOC   LINK LSN          SLC TYPE     SET  BPS    ECM   N1   N2
2105 A    lsn151       0  LIMDS0   1    56000  BASIC ---  ---
```

9. If the output of 8 shows that any of the signaling links in the specified linkset are the last signaling links on the card, place that card out of service by using the `rmv-card` command, specifying the card location to be taken out of service. For this example, enter these commands.

   ```
   rmv-card:loc=1205
   ```

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 07-05-07  11:11:28 GMT  EAGLE5 37.0.0
   Card has been inhibited.
   ```

   ```
   rmv-card:loc=1103
   ```

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 07-05-07  11:11:28 GMT  EAGLE5 37.0.0
   Card has been inhibited.
   ```

   ```
   rmv-card:loc=2105
   ```

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 07-05-07  11:11:28 GMT  EAGLE5 37.0.0
   Card has been inhibited.
   ```

10. Remove all links in the linkset using the `dlt-slk` command. For this example, enter these commands.

    ```
    dlt-slk:loc=1205:link=b
    ```

    ```
    dlt-slk:loc=1207:link=b
    ```

    ```
    dlt-slk:loc=1211:link=a
    ```

    ```
    dlt-slk:loc=1213:link=b
    ```

```
dlt-slk:loc=1103:link=a
```

```
dlt-slk:loc=2105:link=a
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 07-05-07 08:41:17 GMT  EAGLE5 37.0.0
DLT-SLK: MASP A - COMPLTD
```

> **Note:**
>
> If the signaling links removed in this step were not assigned to either the SS7IPGW or IPGWI applications, continue the procedure with 14.

11. Display the IPGWx linksets by entering the `rept-stat-iptps` command.

    This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0
IP TPS USAGE REPORT

           THRESH  CONFIG/  CONFIG/         TPS    PEAK      PEAKTIMESTAMP
                      RSVD      MAX
--------------------------------------------------------------------------
LSN
lsgw1101      80%    ----     10000  TX:    7200     7600   04-06-10 11:40:04
                                    RCV:    7200     7600   04-06-10 11:40:04
lsgw1103      80%    ----     10000  TX:    6700     7600   04-06-10 11:40:04
                                    RCV:    6500     7600   04-06-10 11:40:04
lsgw1105      80%    ----     10000  TX:    7300     7450   04-06-10 11:40:04
                                    RCV:    7300     7450   04-06-10 11:40:04
--------------------------------------------------------------------------

Command Completed.
```

12. Enter the `rtrv-ls` command with one of the linkset names shown in 11. This is to verify if the linkset being removed in this procedure is a mate to another IPGWx linkset.

    Repeat this step until all the linksets in 11 have been displayed, or a linkset is found that has the linkset being removed as a mate. For this example, enter this command.

    `rtrv-ls:lsn=lsgw1105`

    This is an example of the possible output.

```
rlghncxa03w 07-05-17 11:43:04 GMT EAGLE5 37.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsgw1105       009-002-003    none 1   1   no  A   1    off off off no
off
```

```
          CLLI          TFATCABMLQ MTPRSE ASL8
          -----------   1          no     no

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          yes     lsgw1103   10000 70     % 70       % CdPA

          LOC  LINK SLC TYPE
          1105 A    0   SS7IPGW


Link set table is ( 14 of 1024)  1% full
```

> **Note:**
>
> If the `rtrv-ls` output in this step shows that the linkset being removed is not the mate of another IPGWx linkset, continue the procedure with 14.

13. Remove the mate linkset assignment shown in 12 by performing the “Configuring a Mate **IPGWx** Linkset” procedure in *Database Administration - IP7 User's Guide* using these parameters.

    `:lsn` = the name of the linkset shown in the `LSN` field in 12.

    `:matelsn` = the name of the linkset shown in the `MATELSN` field in 12.

    `:action=delete`

14. Display any entires in the route exception table whose linkset name is the name of the linkset being removed in this procedure. Enter the `rtrv-rtx` command with the `lsn` parameter. For this example, enter this command.

    Remove all the entries displayed in this step by performing the Removing a Route Exception Entry procedure.

    `rtrv-rtx:lsn=ls1`

    This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

    DPCA          RTX-CRITERIA              LSN         RC     APC

    240-012-006   OPCA
                  008-008-008               ls1         40
240-012-004

    DESTINATION ENTRIES ALLOCATED:   2000
        FULL DPC(s):                   15
        EXCEPTION DPC(s):               5
        NETWORK DPC(s):                 0
        CLUSTER DPC(s):                 1
        TOTAL DPC(s):                  21
        CAPACITY (% FULL):              1%
```

```
    ALIASES ALLOCATED:              12000
        ALIASES USED:                   0
        CAPACITY (% FULL):              0%
    X-LIST ENTRIES ALLOCATED:         500
```

```
rtrv-rtx:lsn=lsgw1103
```

This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

    DESTINATION ENTRIES ALLOCATED:   2000
        FULL DPC(s):                   15
        EXCEPTION DPC(s):               5
        NETWORK DPC(s):                 0
        CLUSTER DPC(s):                 1
        TOTAL DPC(s):                  21
        CAPACITY (% FULL):              1%
    ALIASES ALLOCATED:              12000
        ALIASES USED:                   0
        CAPACITY (% FULL):              0%
    X-LIST ENTRIES ALLOCATED:         500
```

```
rtrv-rtx:lsn=lsn151
```

This is an example of the possible output.

```
rlghncxa03w 07-05-10 11:43:04 GMT EAGLE5 37.0.0

    DESTINATION ENTRIES ALLOCATED:   2000
        FULL DPC(s):                   15
        EXCEPTION DPC(s):               5
        NETWORK DPC(s):                 0
        CLUSTER DPC(s):                 1
        TOTAL DPC(s):                  21
        CAPACITY (% FULL):              1%
    ALIASES ALLOCATED:              12000
        ALIASES USED:                   0
        CAPACITY (% FULL):              0%
    X-LIST ENTRIES ALLOCATED:         500
```

If the linkset being removed in this procedure is not assigned to a route exception table entry, no entries are displayed in the `rtrv-rtx` output, but a summary of the point code quanties is displayed.

If the name of the linkset being removed in this procedure shown in the `LSN` column in this step, perform one of these procedures:

a. Change the name of the linkset in the entries displayed in this step by performing the Changing a Route Exception Entry procedure.
b. Remove all the entries displayed in this step by performing the Removing a Route Exception Entry procedure.

15. If the Flexible Linkset Optional Based Routing feature is enabled and turned on, and the linkset if referenced by any GTT selectors, the linkset cannot be removed.

    If the linkset contains the entries `fcd`, `fcg`, `fcdfcg`, or `fcgfcd` in the `GTTMODE` column of the `rtrv-ls` output in 4, the Flexible Linkset Optional Based Routing feature is enabled and turned on. Continue the procedure with 17.

    If the linkset does not contain the entries `fcd`, `fcg`, `fcdfcg`, or `fcgfcd` in the `GTTMODE` column of the `rtrv-ls` output in 4, continue the procedure with 16.

16. Verify whether or not the Flexible Linkset Optional Based Routing feature is enabled and turned on by entering this command.

    `rtrv-ctrl-feat:partnum=893027701`

    This is an example of the possible output.

```
rlghncxa03w 09-05-10 11:43:04 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
Flex Lset Optnl Based Rtg 893027701 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

    If the Flexible Linkset Optional Based Routing feature is enabled and turned on, continue the procedure with 17.

    If the Flexible Linkset Optional Based Routing feature is not enabled or not turned on, continue the procedure with 18.

17. Display the GTT selectors that contain the linkset that is being removed by entering the `rtrv-gttsel` command with the name of the linkset. For this example, enter these commands.

    `rtrv-gttsel:lsn=ls1`

    This is an example of the possible output.

```
rlghncxa03w 09-05-10 11:43:04 GMT EAGLE5 41.0.0


GTI                     CG                    CDPA              CGPA
ANSI TT  NP       NAI   SSN SELID LSN         GTTSET            GTTSET
2    180 --       ---   any none  ls1         -----     (---  )
```

```
cdgta4   (cdgta)

GTI                 CG                   CDPA             CGPA
INTL TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET



GTI                 CG                   CDPA             CGPA
NATL TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET


GTI                 CG                   CDPA             CGPA
N24  TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET
```

```
rtrv-gttsel:lsn=lsgw1103
```

This is an example of the possible output.

```
rlghncxa03w 09-05-10 11:43:04 GMT EAGLE5 41.0.0


GTI                 CG                   CDPA             CGPA
ANSI TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET
2    170 --      ---  any none  lsgw1103   -----     (---  ) cdgta4
(cdgta)

GTI                 CG                   CDPA             CGPA
INTL TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET



GTI                 CG                   CDPA             CGPA
NATL TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET


GTI                 CG                   CDPA             CGPA
N24  TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET
```

```
rtrv-gttsel:lsn=lsn151
```

This is an example of the possible output.

```
rlghncxa03w 09-05-10 11:43:04 GMT EAGLE5 41.0.0


GTI                 CG                   CDPA             CGPA
ANSI TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET
2    160 --      ---  any none  lsn151     -----     (---  ) cdgta4
(cdgta)

GTI                 CG                   CDPA             CGPA
INTL TT  NP      NAI  SSN SELID LSN        GTTSET           GTTSET
```

```
GTI                 CG                  CDPA            CGPA
NATL TT   NP      NAI   SSN SELID LSN           GTTSET          GTTSET


GTI                 CG                  CDPA            CGPA
N24  TT   NP      NAI   SSN SELID LSN           GTTSET          GTTSET
```

If GTT selectors are shown in the `rtrv-gttsel` output, perform the "Removing a GTT Selector" procedure in *Database Administration - GTT User's Guide* to remove all entries shown in this step. After the GTT selectors have been removed, continue the procedure with 18.

If GTT selectors are not shown in the `rtrv-gttsel` output, continue the procedure with 18.

18. Remove the linkset using the `dlt-ls` command. For this example, enter these commands.

    `dlt-ls:lsn=ls1`

    `dlt-ls:lsn=lsgw1103`

    `dlt-ls:lsn=lsn151`

    When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 07-05-17 16:03:12 GMT  EAGLE5 37.0.0
Link set table is ( 23 of 1024)  2% full
DLT-LS: MASP A - COMPLTD
```

19. Verify the changes using the `rtrv-ls` command with the linkset name used in 18.

    For this example, enter these commands.

    `rtrv-ls:lsn=lsn1`

    `rtrv-ls:lsn=lsgw1103`

    `rtrv-ls:lsn=lsn151`

    If the removal of the linkset was successful, the following message is displayed.

```
rlghncxa03w 09-07-10 11:43:04 GMT EAGLE5 41.1.0

No matching entry found.

Link set table is (11 of 1024) 1% full.
```

Continue the procedure with 20 if the linkset that was removed in has any of these attributes.

- The linkset was not a proxy linkset.
- The linkset was a proxy linkset whose APC was assigned to only the proxy linkset that was removed in 18.

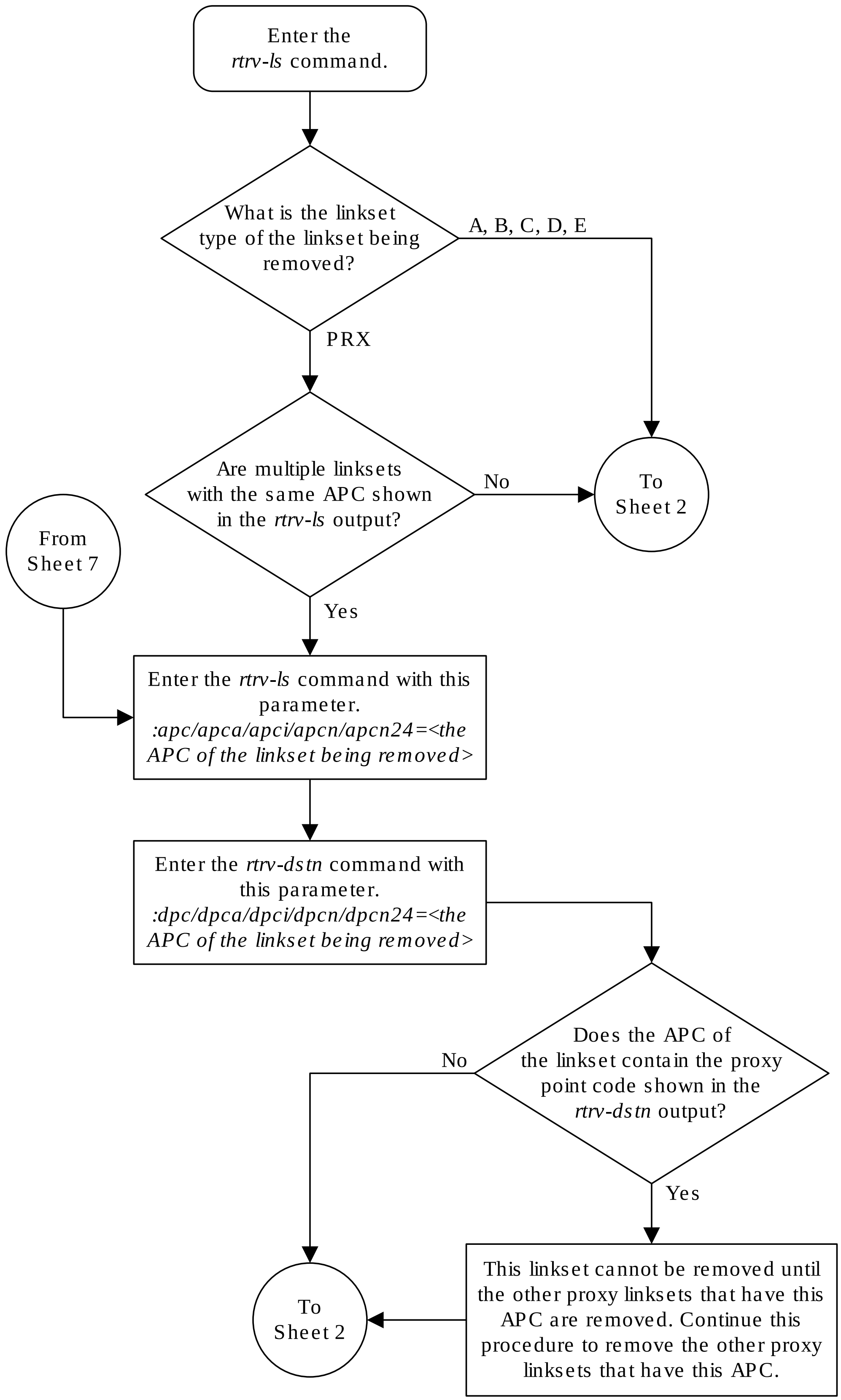
- The linkset was a proxy linkset and:
  - The APC of this linkset is assigned to more than one linkset.
  - The linkset did not contain the proxy point code that was assigned to the APC of the linkset.
  - The linkset that contains the proxy point code that is assigned to the APC of the linkset will not be removed from the database.

If you wish to remove the proxy linkset that contains the proxy point code that is also assigned to the APC of the linkset, and the database contains other linksets that are assigned to this APC, these other linksets must be removed before the proxy linkset that contains the proxy point code that is also assigned to the APC of the linkset can be removed. Repeat this procedure from 2 to remove these linksets. After these linksets have been removed, perform this procedure again from 2 to remove the proxy linkset that contains the proxy point code that is also assigned to the APC of the linkset.

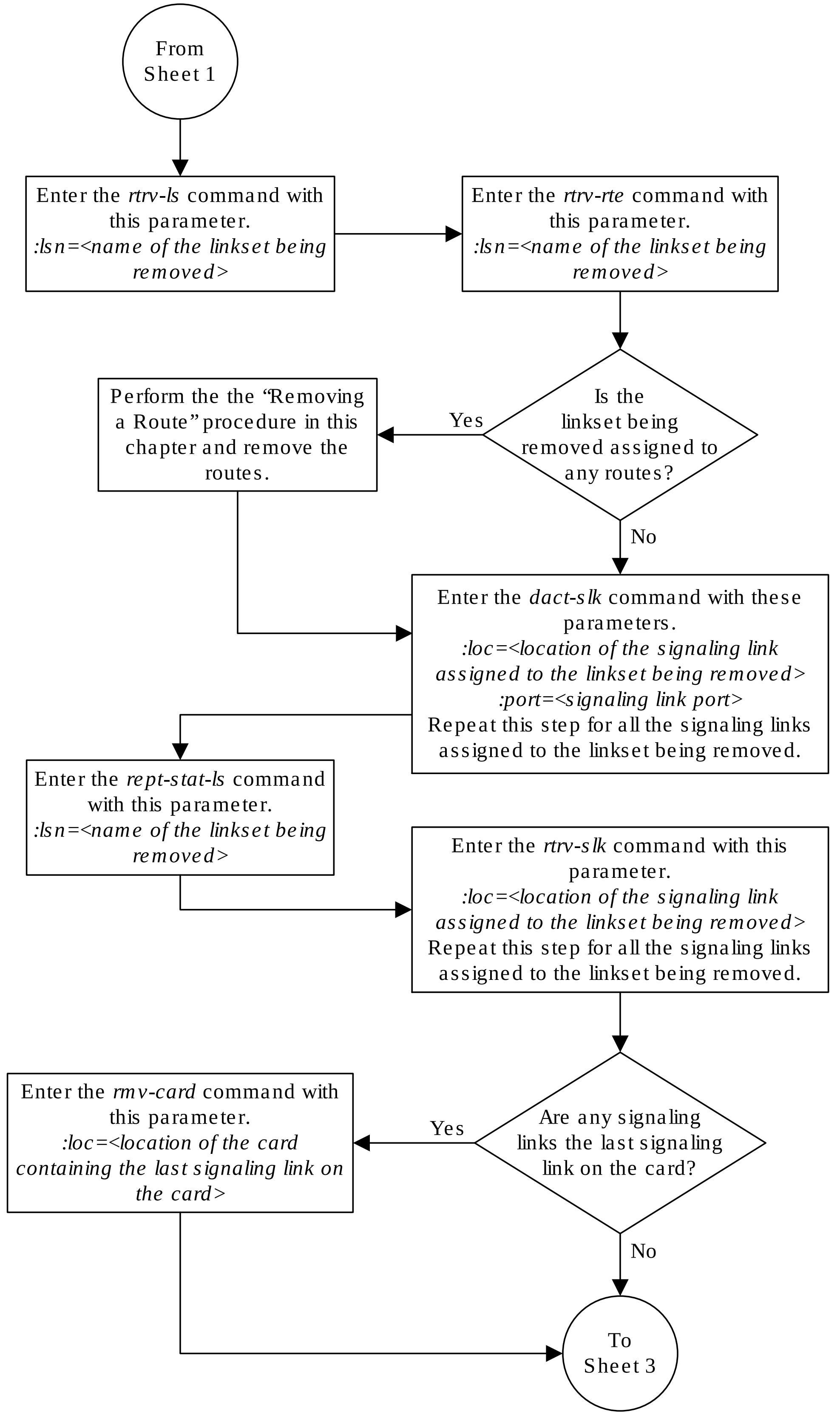
20. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

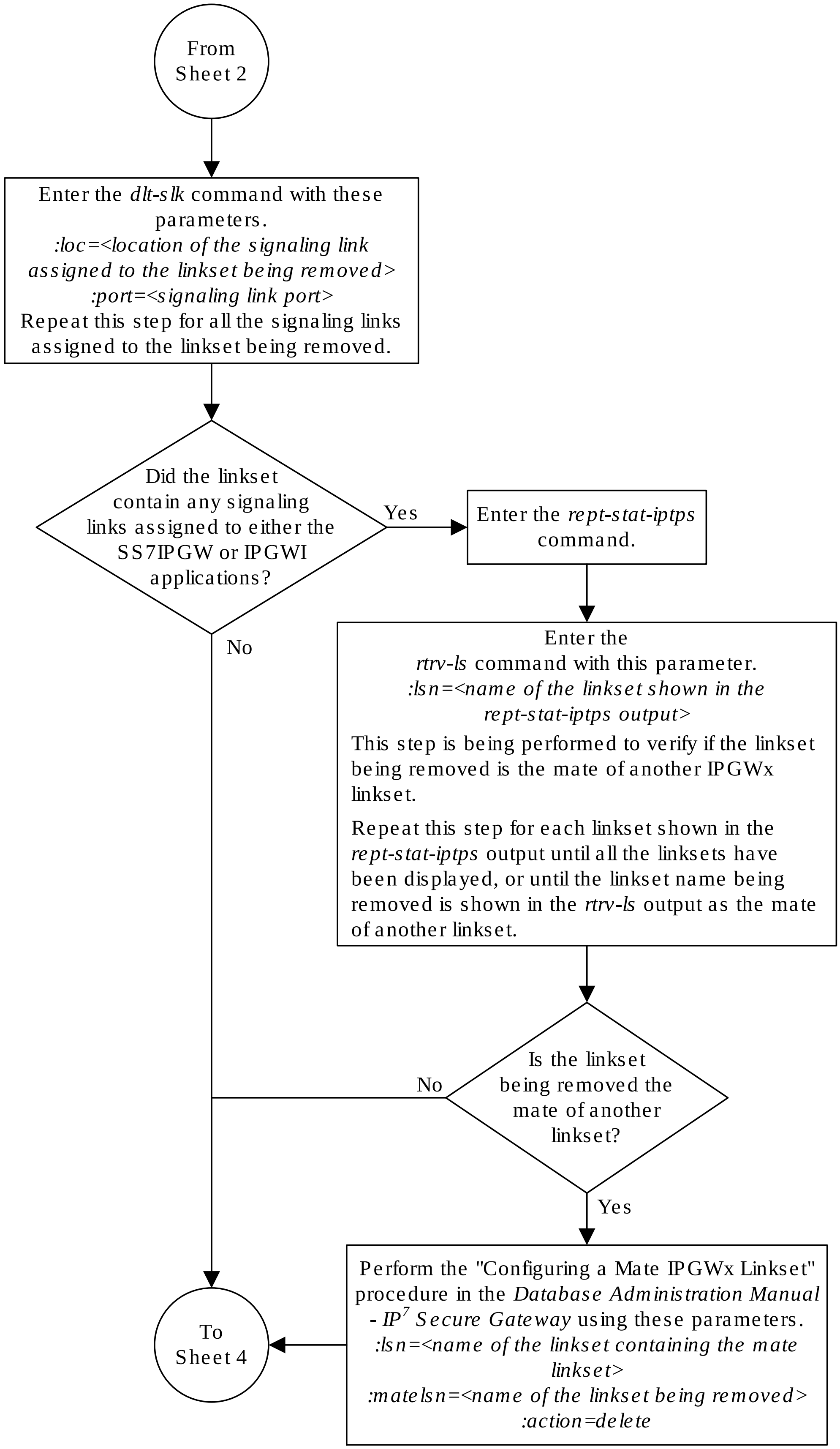
Figure 3-11 Removing a Linkset Containing SS7 Signaling Links



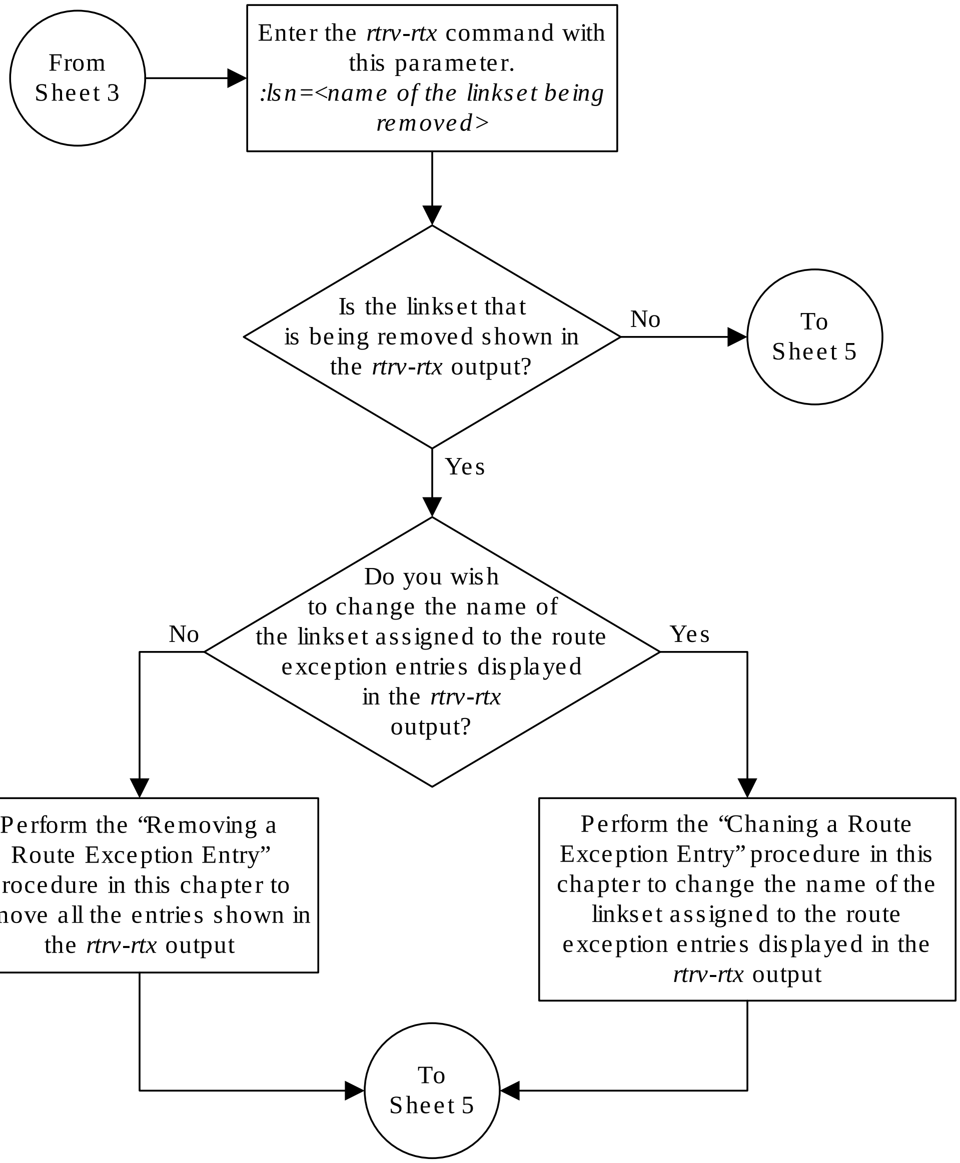
Sheet 1 of 7


From Sheet 1
Enter the rtrv-ls command with this parameter. :lsn=<name of the linkset being removed>
Enter the rtrv-rte command with this parameter. :lsn=<name of the linkset being removed>
Is the linkset being removed assigned to any routes?
Yes
No
Perform the the "Removing a Route" procedure in this chapter and remove the routes.
Enter the dact-slk command with these parameters. :loc=<location of the signaling link assigned to the linkset being removed> :port=<signaling link port> Repeat this step for all the signaling links assigned to the linkset being removed.
Enter the rept-stat-ls command with this parameter. :lsn=<name of the linkset being removed>
Enter the rtrv-slk command with this parameter. :loc=<location of the signaling link assigned to the linkset being removed> Repeat this step for all the signaling links assigned to the linkset being removed.
Are any signaling links the last signaling link on the card?
Yes
No
Enter the rmv-card command with this parameter. :loc=<location of the card containing the last signaling link on the card>
To Sheet 3

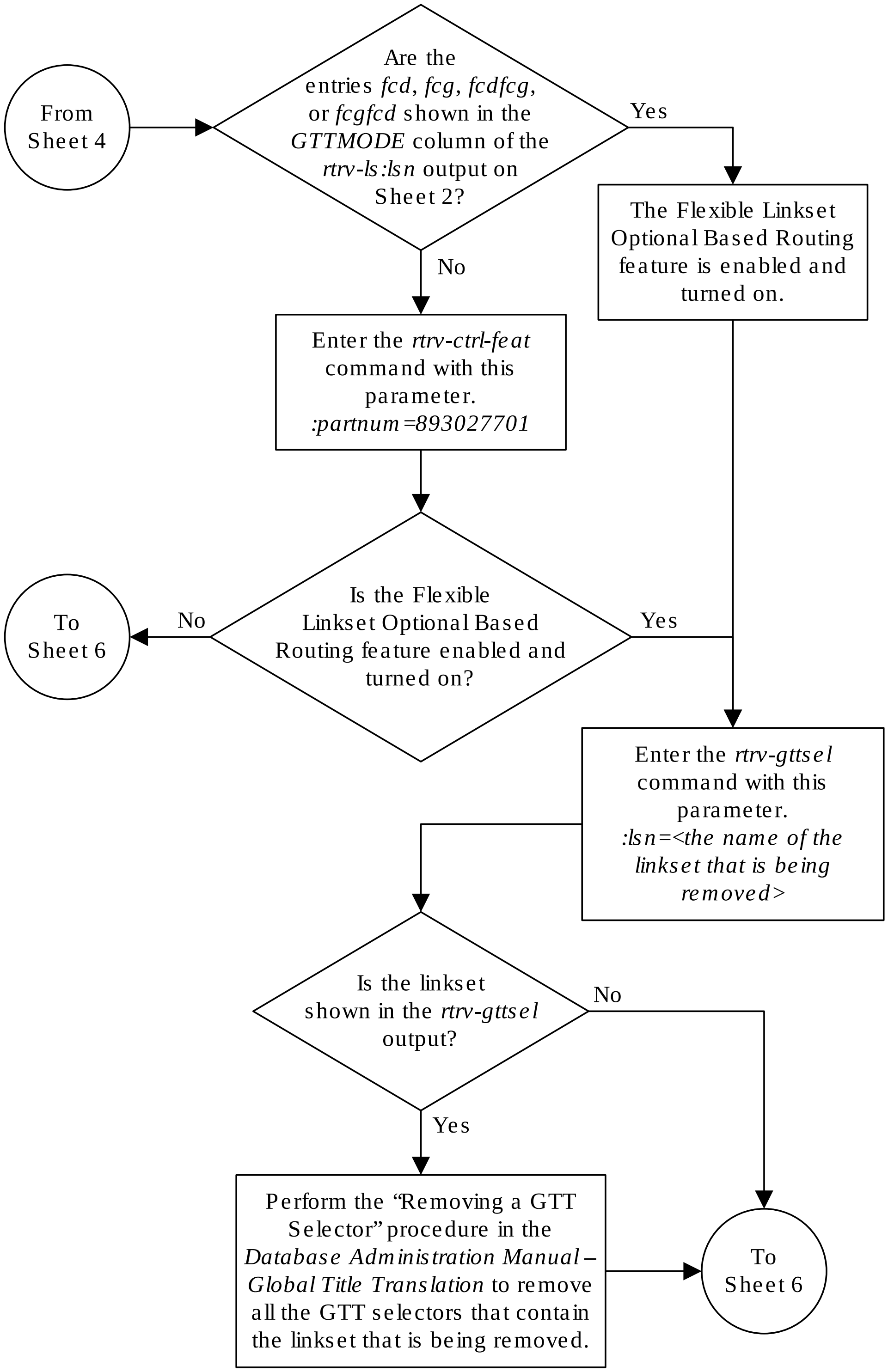
Sheet 2 of 7


From Sheet 2
Enter the *dlt-slk* command with these parameters.
:loc=<location of the signaling link assigned to the linkset being removed>
:port=<signaling link port>
Repeat this step for all the signaling links assigned to the linkset being removed.
Did the linkset contain any signaling links assigned to either the SS7IPGW or IPGWI applications?
Yes
No
Enter the *rept-stat-iptps* command.
Enter the *rtrv-ls* command with this parameter.
:lsn=<name of the linkset shown in the rept-stat-iptps output>
This step is being performed to verify if the linkset being removed is the mate of another IPGWx linkset.
Repeat this step for each linkset shown in the *rept-stat-iptps* output until all the linksets have been displayed, or until the linkset name being removed is shown in the *rtrv-ls* output as the mate of another linkset.
Is the linkset being removed the mate of another linkset?
No
Yes
Perform the "Configuring a Mate IPGWx Linkset" procedure in the *Database Administration Manual - IP7 Secure Gateway* using these parameters.
:lsn=<name of the linkset containing the mate linkset>
:matelsn=<name of the linkset being removed>
:action=delete
To Sheet 4

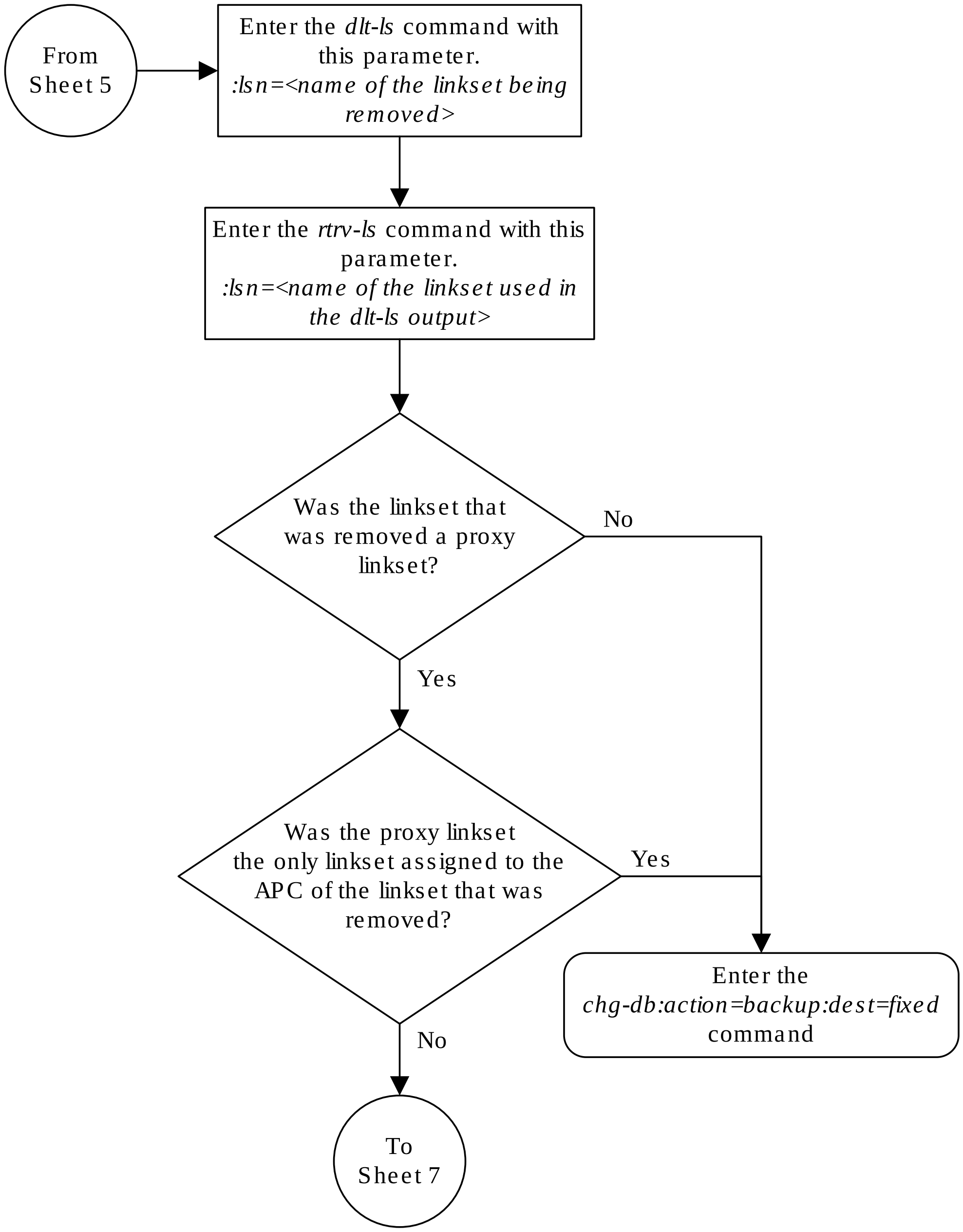
Sheet 3 of 7


From Sheet 3
Enter the rtrv-rtx command with this parameter.
:lsn=<name of the linkset being removed>
Is the linkset that is being removed shown in the rtrv-rtx output?
No
To Sheet 5
Yes
Do you wish to change the name of the linkset assigned to the route exception entries displayed in the rtrv-rtx output?
No
Yes
Perform the "Removing a Route Exception Entry" procedure in this chapter to remove all the entries shown in the rtrv-rtx output
Perform the "Chaning a Route Exception Entry" procedure in this chapter to change the name of the linkset assigned to the route exception entries displayed in the rtrv-rtx output
To Sheet 5

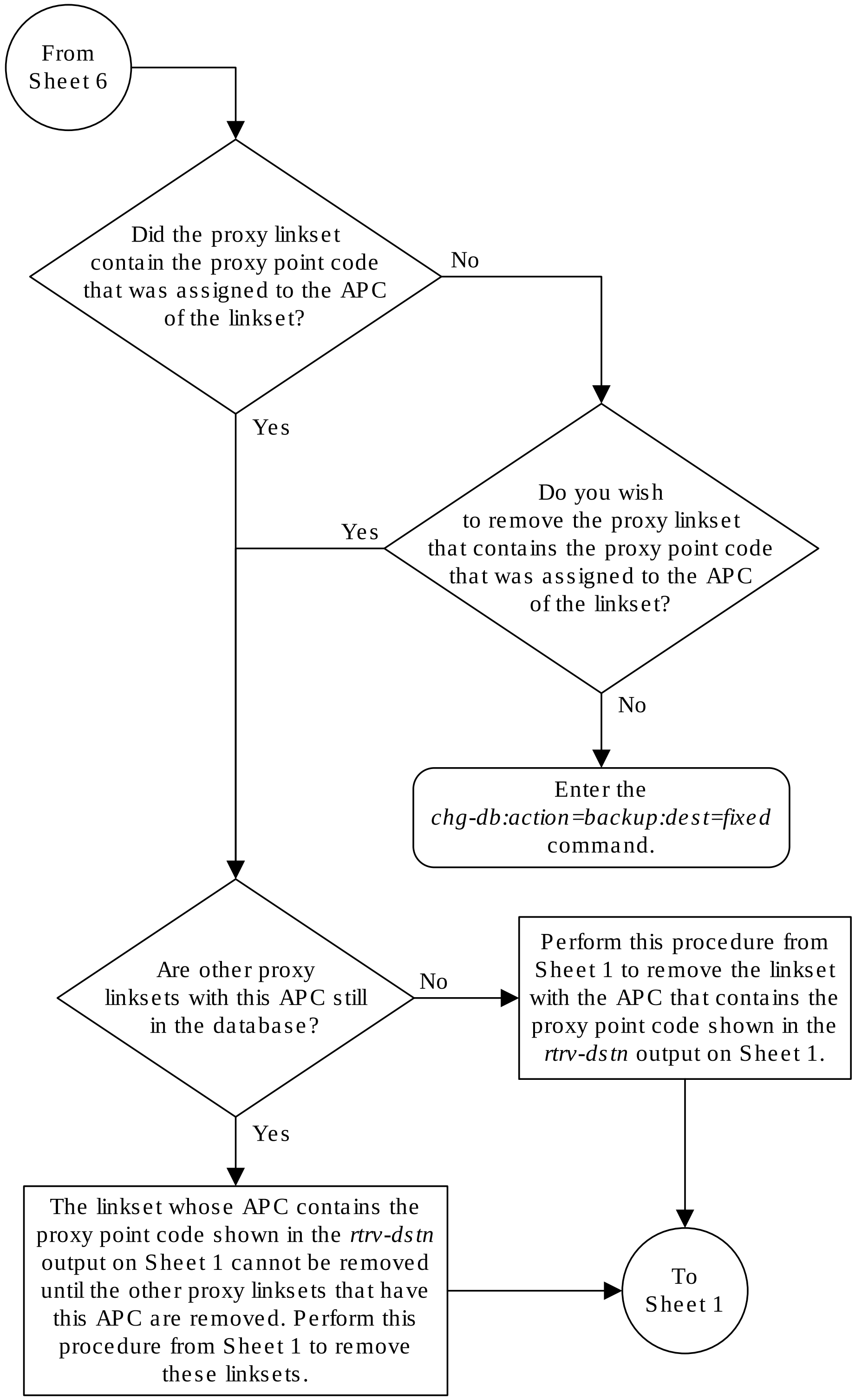
Sheet 4 of 7


From Sheet 4
Are the entries fcd, fcg, fcdfcg, or fcgfcd shown in the GTTMODE column of the rtrv-ls:lsn output on Sheet 2?
Yes
The Flexible Linkset Optional Based Routing feature is enabled and turned on.
No
Enter the rtrv-ctrl-feat command with this parameter.
:partnum=893027701
Is the Flexible Linkset Optional Based Routing feature enabled and turned on?
No
To Sheet 6
Yes
Enter the rtrv-gttsel command with this parameter.
:lsn=<the name of the linkset that is being removed>
Is the linkset shown in the rtrv-gttsel output?
No
Yes
Perform the "Removing a GTT Selector" procedure in the Database Administration Manual – Global Title Translation to remove all the GTT selectors that contain the linkset that is being removed.
To Sheet 6

Sheet 5 of 7


From
Sheet 5
Enter the *dlt-ls* command with this parameter.
:lsn=<name of the linkset being removed>
Enter the *rtrv-ls* command with this parameter.
:lsn=<name of the linkset used in the dlt-ls output>
Was the linkset that was removed a proxy linkset?
No
Yes
Was the proxy linkset the only linkset assigned to the APC of the linkset that was removed?
Yes
No
Enter the
chg-db:action=backup:dest=fixed
command
To
Sheet 7

Sheet 6 of 7


From Sheet 6
Did the proxy linkset contain the proxy point code that was assigned to the APC of the linkset?
No
Yes
Do you wish to remove the proxy linkset that contains the proxy point code that was assigned to the APC of the linkset?
Yes
No
Enter the *chg-db:action=backup:dest=fixed* command.
Are other proxy linksets with this APC still in the database?
No
Perform this procedure from Sheet 1 to remove the linkset with the APC that contains the proxy point code shown in the *rtrv-dstn* output on Sheet 1.
Yes
The linkset whose APC contains the proxy point code shown in the *rtrv-dstn* output on Sheet 1 cannot be removed until the other proxy linksets that have this APC are removed. Perform this procedure from Sheet 1 to remove these linksets.
To Sheet 1

Sheet 7 of 7

3.14 Changing an SS7 Linkset

This procedure is used to change the attributes of a **SS7** linksets to the EAGLE using the `chg-ls` command and the following parameters shown in Table 3-10.

Table 3-10 Linkset Parameters

lsn	nlsn	apc/apca/apci/ apcn/apcn24	spc/spca/spci/ spcn/spcn24	apcntype	lst
clli	sltset	l3tset	scrn	gwsa	gwsm
gwsd	bei	tfatcabmlq	nis	itutfr	mtprse
slsci	asl8	slsrsb	slsocbit	multgc	gttmode
randsls	cggtmod	islsrsb			

`:lsn` – The name of the linkset

`:nlsn` – The new name of the linkset

The linkset name can contain up to 10 characters, with the first character being a letter. However, the **SEAS** interface supports only eight characters. If this linkset is displayed on the **SEAS** interface and the linkset name contains more than eight characters, only the first eight characters in the linkset name are shown. If this linkset name contains more than eight characters, and is specified with the linkset commands on the **SEAS** interface, only the first eight characters can be specified.

`:apc/apca/apci/apcn/apcn24` – Adjacent point code – the point code identifying the node that is next to the EAGLE. The adjacent point code can be one of the following types of point codes:

- :`apc`/`apca` – **ANSI** point code
- :`apci` – **ITU**-I point code, ITU-I spare point code
- :`apcn` – 14-bit **ITU**-N point code, 14-bit **ITU**-N spare point code
- :`apcn24` – 24-bit **ITU**-N point code

`:spc/spca/spci/spcn/spcn24` – Secondary point code used for multiple linksets that have the same APC, or the value `none`. If the value `none` is specified, the existing secondary point code that is assigned to the linkset is removed. Secondary point codes can be used only if the Multiple Linksets to Single Adjacent PC feature is enabled and turned on (shown in the `rtrv-ctrl-feat` output. The secondary point code can be one of the following types of point codes:

- :`spc`/`spca` – **ANSI** point code
- :`spci` – **ITU**-I point code, **ITU**-I spare point code
- :`spcn` – 14-bit **ITU**-N point code, 14-bit **ITU**-N spare point code
- :`spcn24` – 24-bit **ITU**-N point code

> **Note:**
>
> Refer to Point Code Formats for a definition of the point code types that are used on the **EAGLE** and for a definition of the different formats that can be used for **ITU** national point codes. Private point codes can be assigned only to **IPGWx** linksets. The procedures for configuring **IPGWx** linksets are in *Database Administration - IP7 User's Guide*.

`:apcntype` – Specifies whether or not the linkset containing either a 14-bit **ITU**-N adjacent point code or a 24-bit **ITU**-N adjacent point code is being used in China (`apcntype=itunchina`) or in countries other than China (`apcntype=itun`). Signaling links in linksets with the `apcntype=itunchina` parameter are handled according to the specifications in *YD/N 068-1997, Technical Specification of National No.7 Signaling System* - **Message Transfer Part** *(***MTP***)*. Signaling links in linksets with the `apcntype=itun` parameter are handled according to the specifications in *ITU-T Q.2210 (07/96), Switching and Signaling, Broadband ISDN- Signaling Network Protocols*. The default value for the `apcntype` parameter is `itun`.

Linksets shown in section of the `rtrv-ls` output with the `LSN (CHINA)` column (and with either the `APCN` or `APCN24` column) have the `acpntype=itunchina` parameter assigned to them.
Linksets shown in section of the `rtrv-ls` output with the `LSN` column (and with either the `APCN` or `APCN24` column) have the `acpntype=itun` parameter assigned to them.

`:lst` – The linkset type of the specified linkset

`:clli` – The **Common Language Location Identifier** assigned to this point code. The value of the `clli` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command.

`:sltset` – The signaling link test message record to be associated with the linkset.

`:l3tset` – The level 3 timer set table. This parameter identifies which level three timer set is to be assigned to this linkset. Currently, only one is supported.

`:scrn` – The name of the screenset to be assigned to this linkset if gateway screening is to be used.

`:gwsa` – Gateway screening action determines whether gateway screening (**GWS**) is on or off for the specified link set.

`:gwsm` – Gateway screening messaging is used to turn on or off the display of messages generated for each screened message. When an **MSU** is rejected by gateway screening, a message is output to alert personnel of the event.

`:gwsd` – Gateway screening **MSU** discard is used to turn on or off the discarding of **MSUs** that bypass the gateway screening function due to load shedding. Also use this parameter with the redirect function; **MSUs** that cannot be screened are discarded if you specify `gwsd=on`.

`:bei` – The broadcast exception indicator. This parameter indicates whether **TFP** (transfer prohibited) messages are allowed to be broadcast on the linkset. The `yes` parameter means **TFPs** are not broadcast. The no parameter means **TFPs** are broadcast.

:tfatcabmlq – the **TFA**/**TCA** broadcast minimum link quantity shows the minimum number of signaling links in the given link set (or in the combined link set in which it resides) that must be available for traffic. When the number of signaling links in the specified linkset is equal to or greater than the value of the tfatcabmlq parameter, the status of the routes that use the specified linkset is set to allowed and can carry traffic. Otherwise, these routes are restricted. The value of the tfatcabmlq parameter cannot exceed the total number of signaling links contained in the linkset. The system default value for the tfatcabmlq parameter is 0.

The value of the tfatcabmlq parameter is only displayed in the rtrv-ls command output when a specific linkset is being displayed with the rtrv-ls:lsn=<linkset name> command.

The tfatcabmlq parameter exists only in the chg-ls command and not the ent-ls command, because no links are assigned to the linkset when the linkset is first created with the ent-ls command. The default value for the tfatcabmlq parameter (tfatcabmlq=0) is entered for the linkset, and shown in the rtrv-ls output as 1, when a new linkset is added to the database.

When the tfatcabmlq parameter value is 0, the **EAGLE** 5 **ISS** broadcasts **TFAs**/**TCAs** only when 1/2 of the links in the linkset (or in the combined link set in which it resides) become available. The tfatcabmlq parameter value displayed in the rtrv-ls output is 1/2 of the number of signaling links contained in the linkset. If the number of signaling links in the linkset is an odd number, the tfatcabmlq parameter value is rounded up to the next whole number. As signaling links are added or removed from the linkset, the tfatcabmlq parameter value will be changed automatically.

When the lst=c parameter is specified, or when the current (unchanged) LST value is C, the tfatcabmlq parameter cannot be specified unless the LSRESTRICT SS7 option is on. The state of the LSRESTRICT SS7 option is shown in the rtrv-ss7opts output.

:nis – specifies whether the National Spare for Network Indicator feature is on or off for the specific linkset. This feature allows the linkset to use the national spare value (3) for the network indicator code field in the service information octet (**SIO**) of the **MSU** for **ANSI** linksets and **ITU** national linksets (linksets containing either 14-bit **ITU**-N point codes or 24-bit **ITU**-N point codes). This parameter cannot be specified for **ITU** international linksets. The default value for the nis parameter is off.

For **MSUs** on incoming linksets, only those **MSUs** having the network indicator code values shown in Table 3-11 are allowed into the **EAGLE** 5 **ISS**.

For **MSUs** on outgoing linksets, the network indicator code value in the **MSU** is changed to either the national network indicator code value (2) or the national spare network indicator code value (3). If the nis parameter is set to off, the network indicator code value is set to 2.

These actions are summarized in Table 3-11.

The actions described for this parameter apply only if the **ITU** National and International **Spare Point Code** Support feature is not enabled.

If the **ITU** National and International **Spare Point Code** Support feature is enabled, the nis parameter value is ignored for **ITU**-I and 14-bit **ITU**-N linksets. All the network indicator values are permitted on **ITU**-I and **ITU**-N linksets, and the network indicator value for transmission is based on the International/National and Spare/Non-Spare status of the **DPC** of the message.

Having the **ITU** National and International **Spare Point Code** Support feature enabled has no effect on **ANSI** and 24-bit **ITU**-N linksets. The nis parameter value determines which incoming network indicator spare bit values to permit, and what network indicator spare bit value should be transmitted.

Table 3-11 Actions of the National Spare for Network Indicator Feature

Linkset Type	Feature Disabled	Feature Enabled
Incoming **ANSI** Linkset	**MSUs** containing the national network indicator code (2) are allowed into the **EAGLE**.	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • National Network Indicator Code (2) • National Spare Network Indicator Code (3)
Outgoing **ANSI** Linkset	The network indicator code value in the **MSU** is set to the national network indicator code (2).	The network indicator code value in the **MSU** is set to the national spare network indicator code (3).
Incoming **ITU** National Linkset	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • International Network Indicator Code (0) • National Network Indicator Code (2)	**MSUs** containing these network indicator code values are allowed into the **EAGLE**. • International Network Indicator Code (0) • National Network Indicator Code (2) • National Spare Network Indicator Code (3)
Outgoing **ITU** National Linkset	The network indicator code value in the **MSU** is set to the national network indicator code (2).	The network indicator code value in the **MSU** is set to the national spare network indicator code (3).

`:itutfr` – specifies whether or not **ITU TFR** (transfer restricted) procedures are being used on the linkset. This parameter applies only to linksets with **ITU** national adjacent point codes (linksets containing either 14-bit **ITU**-N point codes or 24-bit **ITU**-N point codes) and can be specified only for linksets with **ITU** national adjacent point codes. **TFR** procedures are used to redirect traffic away from a node that is having problems routing traffic to a destination. When a node determines that a destination is restricted, the node sends a **TFR** message informing the adjacent nodes about the destination's status. When a destination is restricted, the node should not be used to route messages to the destination even though it still has limited capability to do so. The values for this parameter are either on (**ITU TFR** procedures are enabled) or off (**ITU TFR** procedures are disabled). For more information on the `itutfr` parameter and **ITUTFR** procedures, refer to ITU TFR Procedures.

`:mtprse` – shows if the node adjacent to the **EAGLE** is equipped with the **MTP** restart capability. The `mtprse=yes` parameter can only be specified if the **MTP** restart feature is turned on for **ANSI** linksets (`MTPRS = on` in the `rtrv-feat` command output), or if the **ITU MTP** restart is on for **ITU** linksets (`ITUMTPRS=on` in the `rtrv-feat` command output). If the **MTP** restart feature is not turned on, the value of the `mtprse` parameter defaults to `no`. The value of the `mtprse` parameter value is not dependent on the value of the `mtprsi` parameter (the **MTP** restart indicator) in the `chg-stpopts` command. The value of the `mtprse` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command. For more information on the `mtprse` parameter and **MTP** restart, refer to Configuring the MTP Restart Feature.

`:slsci` – indicates whether the 5-bit to 8-bit **SLS** conversion feature is used to select signaling links for outgoing messages on the specified link set. If the `slsci=yes` parameter is specified, the **EAGLE** replaces any 5-bit **SLS** values contained in received messages with a random 8-bit value before they are used by the **EAGLE** to select the outgoing signaling link in that linkset. The 5-bit to 8-bit **SLS** conversion is also controlled by the `slscnv` parameter of the `chg-stpopts` command. The `slscnv` parameter of the `chg-stpopts` command has three values: `on`, `off`, and `perls`. The `slsci` parameter can only be specified for linksets with **ANSI** SS7 adjacent point codes.

`:asl8` – shows if the node adjacent to the **EAGLE** 5 **ISS** is sending **MSUs** with 8-bit **SLSs**. If the `asl8=yes` parameter is specified with the `lst=a` parameter (a linkset containing access signaling links), this indicates that the originator of the **MSUs** is generating 8-bit **SLSs**. For other linkset types, the `asl8=yes` parameter indicates that the adjacent node is converting 5-bit **SLSs** to 8-bit **SLSs**. The **SLS** in **MSUs** received by the **EAGLE** on a linkset that has the `asl8=yes` parameter assigned to it will not be converted. These **MSUs** are assumed to contain 8-bit **SLSs**. If the `asl8=no` parameter is specified for the linkset, the **SLS** will be converted to an 8-bit **SLS**. The `asl8` parameter can only be specified for linksets with **ANSI SS7** adjacent point codes. The value of the `asl8` parameter is only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command.

For more information on the `slsci` and `asl8` parameters and 5-bit to 8-bit conversion, refer to Configuring the 5-Bit to 8-Bit SLS Conversion Feature.

`:slsrsb` – selects which bit (1 - 4) of the **SLS** field to use as the least significant bit for signaling link selection in the link set for all **ITU** messages on outgoing ITU linksets.

`:islsrsb` – selects which bit of the **SLS** field, 1 - 8 for an ANSI linkset or 1 - 4 for an ITU linkset, to use as the least significant bit for signaling link selection in the link set for all messages on ANSI and ITU linksets on incoming linksets. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter of a ANSI linkset, the `rsls8` value for the linkset must be `yes`. Perform Configuring the RSLS8 Value for ANSI Linksets to change the `rsls8` value for the linkset to `yes`.

`:slsocbit` – selects which bit (5 - 16) of the **SLS** field to use as the most significant bit for signaling link selection in the link set for all **ITU** messages.

For more information on the `slsrsb`, `islsrsb`, and `slsocbit` parameters and **ITU SLS** enhancement, refer to ITU SLS Enhancement.

`:multgc` – specifies whether multiple group codes are supported for the linkset. When this parameter value is `yes`, secondary adjacent point codes whose group codes are different from the adjacent point code of the linkset can be assigned to the linkset. If the parameter value is `no`, the group code of the secondary adjacent point code must be the same as the group code of the linkset's adjacent point code. For more information on secondary adjacent point codes, go to the Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC) procedure.

This parameter only applies to linksets whose adjacent point codes are either **ITU** international point codes or 14-bit **ITU** national point codes. All the signaling links in this linkset must be assigned to cards running the **IPLIMI** application. For more information on assigning signaling links to cards running the **IPLIMI** application, perform the Adding an IPLIMx Signaling Link procedure in *Database Administration - IP7 User's Guide*.

The **ITU** duplicate point code feature must be on before this parameter can be specified. Verify this with the `rtrv-feat` command. If the **ITU** duplicate point code feature is turned on, the `ITUDUPPC` field should be set to `on`. If the **ITU** duplicate point code feature is not turned on, enter the `chg-feat:ituduppc=on` command.

> **Note:**
>
> Once the **ITU** duplicate point code feature is turned on with the `chg-feat` command, it cannot be turned off.
> The **ITU** duplicate point code feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the **ITU** duplicate point code feature, contact your Oracle Sales Representative or Account Representative.

`:gttmode` – The **GTT** mode assigned to the linkset when performing global title translation on the specified linkset. The values for this parameter are:

- `sysdflt` – the value of the `dfltgttmode` parameter shown in the `rtrv-sccpopts` command output.
- `cd` - **CdPAGTT** only
- `cg` - **CgPA** GTT only
- `acdcd` - Advanced CdPA GTT, CdPA GTT
- `acdcgcd` - Advanced CdPA GTT, CgPA GTT, CdPA GTT
- `acdcdcg` - Advanced CdPA GTT, CdPA GTT, CgPA GTT
- `cgacdcd` - CgPA GTT, Advanced CdPA GTT, CdPA GTT
- `cgcd` - CgPA GTT, CdPA GTT
- `cdcg` - CdPA GTT, CgPA GTT
- `fcd` - Flexible Linkset Optional Based Routing (**FLOBR**) CdPA only
- `fcg` - FLOBR CgPA only
- `fcdfcg` - FLOBR CdPA, FLOBR CgPA
- `fcgfcd` - FLOBR CgPA, FLOBR CdPA

For more information on using the `gttmode` parameter, refer to the Origin-Based SCCP Routing Feature section or the Flexible Linkset Optional Based Routing section in *Database Administration - GTT User's Guide*.
To use the values `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, or `cgcd` for the `gttmode` parameter, the Origin-Based SCCP Routing feature must be enabled and turned on.
To use the values `fcd`, `fcg`, `fcdfcg`, or `fcgfcd` for the `gttmode` parameter, the Flexible Linkset Optional Based Routing feature must be enabled and turned on.

`:randsls` – The random **SLS** value assigned to the linkset. This parameter is used to apply random **SLS** generation for the specified linkset.

The `randsls` parameter has three values:

- `off` – Random **SLS** generation is not applied to the specified linkset.

- `class0` – Random **SLS** generation is applied to only Class 0 **SCCP** messages on either incoming ANSI or outgoing ITU linksets.
- `all` – Random **SLS** generation is applied to both Class 0 and Class 1 **SCCP** messages on outgoing ITU linksets, or to Class 0 SCCP messages and ISUP messages on ANSI linksets.

For more information about random **SLS** generation on a specific linkset, refer to Per-Linkset Random SLS.

`:cggtmod` - The calling party GT modification indicator. This parameter specifies whether or not calling party global title modification is required. The values for this parameter are `yes` (calling party global title modification is required) or `no` (calling party global title modification is not required). This parameter can be specified only if the AMGTT or AMGTT CgPA Upgrade feature is enabled. Enter the `rtrv-ctrl-feat` command to verify that either the AMGTT or AMGTT CgPA Upgrade feature is enabled. If the AMGTT or AMGTT CgPA Upgrade feature is not enabled, perform the "Activating the Advanced GT Modification Feature" procedure in *Database Administration - GTT User's Guide* procedure to enable the required feature. For more information about the Advanced GT Modification feature, refer to the "Advanced GT Modification Feature" section in *Database Administration - GTT User's Guide*.

The **EAGLE** can contain 1024 linksets, with a maximum of 255 of these linksets being gateway linksets. A gateway linkset is a linkset that contains routes to a different network.

The linkset to be changed must exist in the database.

If the adjacent point code (**APC**) is changed, the new **APC** must be in the destination point code table and must be defined as a true point code in the destination point code table and cannot be an alias point code. The domain and point code type of the new **APC** must be the same as the **APC** being changed. For example, if the current adjacent point code is an **ITU**-I point code, the new adjacent point code must be an **ITU**-I point code. The new **APC** of the linkset cannot match the self **ID** of the **EAGLE**. The new **APC** must be a full point code and cannot be a cluster point code or a network routing point code.

Linksets containing **E1 ATM** signaling links cannot contain 24-bit **ITU**-N **APCs** or **SAPCs**. **E1 ATM** signaling links are identified by the value `LIME1ATM` in the `TYPE` column of the `rtrv-ls:lsn=<linkset name>` output.

The signaling link configuration of the linkset can be verified by entering the `rtrv-ls:lsn=<linkset name>` command.

Use the `rtrv-dstn` command to verify that the new **APC** is in the destination point code table and to verify the domain of the new **APC**. If the new **APC** is not shown in the `rtrv-dstn` command output, go to the Adding a Destination Point Code procedure and add the **APC** to the destination point code table.

To change the **APC** of a linkset, all signaling links in the linkset must be in the **OOS-MT-DSBLD** state.

The `gwsa`, `gwsm`, and `gwsd` parameters can only be specified if the `scrn` parameter is defined. Enter the `rtrv-ls` command to verify that the `scrn` parameter is defined for the specified linkset. If the `scrn` parameter is defined, a gateway screening screen set name is shown in the `SCRN` field of the output. This gateway screening screen set name must also be defined as a gateway screening screen set entity. This can be verified with the `rtrv-scrset` command.

> **Caution:**
>
> When **Gateway Screening** is in the screen test mode, as defined by the linkset parameters `gwsa=off` and `gwsm=on`, the gateway screening action in the gateway screening stop action set specified by the `actname` parameter of the gateway screening screen set at the end of the gateway screening process will be performed.

The `chg-ls` command has a parameter, `gwsd`, that can allow the discarding of messages that should have gone through the gateway screening process, but could not. The `gwsd` parameter is only intended to be used with the database transport access (**DTA**) feature. If you are not using the **DTA** feature, the `gwsd` parameter should not be specified or should be set to no (`gwsd=no`).

If the `gwsa=off` parameter is specified, then the `gwsd=off` parameter must be specified.

To help manage congestion on signaling links, the **EAGLE** starts the level 3 T31 timer whenever a signaling link goes into congestion level 1 or congestion level 2. The congestion level that is associated with the level 3 T31 timer is set using the `chg-stpopts` command with the `mtpt31ctl` parameter and is displayed with the `MTPT31CTL` field in the `rtrv-stpopts` command output. When the level 3 timer T31 and the `chg-stpopts` command are first introduced to the **EAGLE**, the system default value for the `mtpt31ctl` parameter of the `chg-stpopts` command is 1, for congestion level 1, and the system default value for the level 3 T31 timer is 60 seconds. To change the value of the level 3 T31 timer, perform Changing Level 3 Timers. To change value of the `mtpt31ctl` parameter, enter the either `chg-stpopts:mtpt31ctl=1` or the `chg-stpopts:mtpt31ctl=2` command, depending on the current value of the `mtpt31ctl` parameter.

To help prevent the signaling link in the linkset from oscillating in out of service, the **EAGLE** starts the level 3 T32 timer. When the **EAGLE** begins restoring an out of service signaling link, the **EAGLE** starts the level 3 T32 timer.If the signaling link fails again before the level 3 T32 expires, the **EAGLE** does not attempt to continue to bring the signaling link into service until the level 3 T32 timer expires. Once the level 3 T32 timer expires, the **EAGLE** attempts to restore the signaling link into service. When the level 3 timer T32 is first introduced to the **EAGLE**, the system default value for the level 3 T32 timer is 60 seconds. To change the value of the level 3 T32 timer, perform Changing Level 3 Timers.

The word `SEAS` cannot be used as a value for the `scrn` parameter of the `chg-ls` command. The word `SEAS` is used in the `rtrv-ls` command output, in the `SCRN` field, to show gateway linksets created on the **SEAS** interface. A gateway linkset combines the functions of a gateway screening screen set and an **SS7** linkset specifying the `gwsa=on` and `scrn` parameters. Like an **EAGLE** gateway screening screen set, a gateway linkset defines the screening references that are to be used to screen the messages on the linkset. It also defines the linkset whose messages are to be screened. A gateway linkset can only be configured from a **SEAS** terminal and not from an **EAGLE** terminal.

If the `clli` parameter is specified with the `chg-ls` command, the value of the `clli` parameter must match the **CLLI** value of the adjacent point code of the linkset. The **CLLI** value of the adjacent point code is shown in the `CLLI` field of the `rtrv-dstn` command.

The clli parameter can only be specified with the apc or apca parameters.

If the randsls parameter of the chg-stpopts command is set to either all or class0, a maximum of 16 links continues to be supported in a single linkset to a destination. However, it is now possible to have up to 32 links in a combined linkset to a destination, with a maximum of 16 links per linkset. The 32 links is a change from the current **EAGLE** maximum of only 16 links per combined linkset, which is due to **ITU** protocol restrictions. If more than 16 links are used in a combined linkset, the operator needs to be aware that a maximum of 16 links can be used by non-Random **SLS** traffic over the linkset. The non-Random **SLS** traffic continues to operate under the rules of the **ITU** protocol. For more information on the Random **SLS** Generation feature, refer to Configuring the System for Random SLS Generation.

To provision more than one linkset with the same APC, the Multiple Linksets to Single Adjacent PC feature must be enabled and turned on. The database can contain a maximum of six linksets that have the same APC. If the linkset is not a proxy linkset (linkset types A, B, C, D, or E), a secondary point code (shown in the rtrv-spc output) must be specified with the linkset. The network type and format of the secondary point code must be the same as the APC of the linkset. Secondary point codes can also be assigned to the APC of the linkset when the point code is provisioned in the database with the ent-dstn or chg-dstn commands. The secondary point codes that are assigned to the linksets that have the same APC must be unique for each linkset and cannot be the same as the secondary point code that is assigned to the APC of the linksets.

The secondary point code that is assigned to a linkset can be removed from the linkset by specifying the value none for the spc/spca/spci/spcn/spcn24 parameter. A secondary point code can be removed from only one of the linksets in a group of linksets that have the same APC.

If the linkset is a proxy linkset (linkset type PRX), the APC and linkset type of the linkset cannot be changed. A secondary point code and a secondary adjacent point code cannot be specified for a proxy linkset.

Other Optional Parameters

The chg-ls command contains other optional parameters that are not used this procedure. These parameters are discussed in more detail in *Commands User's Guide* or in these sections.

- Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC)
- The "Configuring a Linkset for the GSM MAP Screening Feature" procedure in *Database Administration - Features User's Guide*.
- These procedures in *Database Administration - IP7 User's Guide*
  - Configuring an IPGWx Linkset
  - Adding a Mate IPGWx Linkset to another IPGWx Linkset
  - Removing a Mate IPGWx Linkset from another IPGWx Linkset
  - Changing an IPSG M3UA Linkset
  - Changing an IPSG M2PA Linkset

If you wish to change the attributes of IPSG linksets, perform one of these procedures in *Database Administration - IP7 User's Guide*

- Changing an IPSG M3UA Linkset
- Changing an IPSG M2PA Linkset

The `gsmscrn` parameter is used for the **GSM MAP** Screening feature. To configure an **SS7** linkset for the **GSM MAP** Screening feature, perform the “Configuring a Linkset for the **GSM MAP** Screening Feature,” in Chapter 5, “**GSM MAP** Screening Configuration,” in *Database Administration - Features User's Guide*.

The network indicator (NI) value of messages on ITU-I or ITU-N linksets can be changed to other values by entering the `icnimap` and `ognimap` parameters of the `chg-lsopts` command. Perform Configuring the ITU Linkset NI Mapping Options to change these values for the ITU-I or ITU-N linksets.

Canceling the RTRV-LS Command

Because the `rtrv-ls` command used in this procedure can output information for a long period of time, the `rtrv-ls` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` command was entered, from another terminal other that the terminal where the `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal’s permissions can be verified with the `rtrv-secu-trm` command. The user’s permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                 L3T SLT                GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2           001-207-000    none 1   1   no  B   6    off off off
no     off
e1m1s1         001-001-001    none 1   1   no  A   7    off off off
no     off
e1m1s2         001-001-002    none 1   1   no  A   7    off off off
no     off
ls04           001-002-003    scr2 1   1   no  a   4    off off off
yes    off
ls1305         000-005-000    none 1   1   no  A   1    off off off
no     off
ls1307         000-007-000    none 1   1   no  A   1    off off off
no     off

                                 L3T SLT                GWS GWS GWS
```

```
LSN            APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i          1-207-0       none 1   1   no  B   4    off off off ---   on
ls1315         0-015-0       none 1   1   no  A   1    off off off ---
off
ls1317         0-017-0       none 1   1   no  A   1    off off off ---   on
e1m2s1         1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2         1-011-2       none 1   1   no  A   7    off off off ---
off

                                  L3T SLT              GWS GWS GWS
LSN            APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5           11520         scr3 1   1   no  a   3    on  off off ---   on
lsn6           11211         scr3 1   1   no  a   3    on  off off ---   on

Link set table is (10 of 1024) 1% full.
```

2. Display the attributes of the linkset that is being changed by entering the `rtrv-ls` command with the name of the linkset shown in 1.For this example, enter these commands.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                  L3T SLT              GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls04           001-002-003   scr2 1   1   no  a   4    off off off yes
off

               SPCA          CLLI          TFATCABMLQ MTPRSE ASL8
            ---------------- -----------   2          ---    no

            RANDSLS
            off

            IPSG  IPGWAPC  GTTMODE           CGGTMOD
            no    no       CdPA                no

                                   L2T               PCR   PCR
           LOC   LINK SLC TYPE     SET   BPS    ECM   N1    N2
           1205  b    0   LIMDS0   1     56000  BASIC ---   -----
           1213  b    1   LIMDS0   1     56000  BASIC ---   -----
           1211  a    2   LIMDS0   1     56000  BASIC ---   -----
           1207  b    3   LIMDS0   1     56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full

rtrv-ls:lsn=lsn5
```

This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                  L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5          11211          scr3 1   1   no  a   3    on  off off
---   on

           CLLI         TFATCABMLQ MTPRSE ASL8
           lsn5clli     1          no     ---

           SLSOCBIT SLSRSB RANDSLS ITUTFR ICNIMAP      OGNIMAP
           none     1      off     off    itun2ituns   ituns2itun

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA                no

                                   L2T               PCR   PCR
          LOC   LINK SLC TYPE      SET  BPS    ECM   N1    N2
          2106  b    0   LIMDS0    1    56000  BASIC ---   -----
          2114  b    1   LIMDS0    1    56000  BASIC ---   -----
          2112  a    2   LIMDS0    1    56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

Continue the procedure by performing one of these actions.

- If the adjacent point code (APC) or secondary point code (SPC) assigned to the linkset is being changed, perform Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset. After Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset has been performed, continue the procedure with 3.
- If the adjacent point code (APC) or secondary point code (SPC) assigned to the linkset is not being changed, continue the procedure with 3.

3. To specify the following optional parameters for the linkset, the feature that corresponds to the parameters must be shown as turned on in the `rtrv-feat` output, or enabled, and turned on if required, in the `rtrv-ctrl-feat` output, or other database entities that correspond to the parameters must be configured in the database.

   Perform the procedure, shown in the following list, that corresponds to the parameters that you wish to specify for the linkset.

   - `scrn`, `gwsa`, `gwsm`, `gwsd` – Verifying the Gateway Screening Configuration for a Linkset
   - `mtprse` – Configuring the MTP Restart Feature
   - `slsci`, `asl8` – Configuring the 5-Bit to 8-Bit SLS Conversion Feature. These parameters only apply to ANSI linksets.
   - `:islsrsb` – Activating the SLS Bit Rotation by Incoming Linkset Feature. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter of an ANSI

linkset, the `rsls8` value for the linkset must be `yes`. Perform Configuring the RSLS8 Value for ANSI Linksets to change the `rsls8` value for the linkset to `yes`.

- `gttmode` – If the value for this parameter will be `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, `cgcd`, or `cdcg`, perform the "Activating the Origin-Based SCCP Routing Feature" in *Database Administration – GTT User's Guide*. The Origin-Based SCCP Routing feature must be enabled and turned on. If the value for this parameter will be `fcd`, `fcg`, `fcgfcd`, or `fcdfcg`, perform the "Activating the Flexible Linkset Optional Based Routing Feature" procedure in *Database Administration – GTT User's Guide*. The Flexible Linkset Optional Based Routing feature must be enabled and turned on.
- `randsls` – Configuring the System for Random SLS Generation. The value of the `randsls` parameter of the `chg-stpopts` command must be `perls`.
- `cgttmode` - "Activating the Advanced GT Modification Feature" in *Database Administration – GTT User's Guide*. Either the AMGTT or AMGTT CgPA Upgrade feature must be enabled.
- `multgc` - Using the MULTGC Parameter when Changing the Attributes of a Linkset. This parameter applies only to linksets with ITU-I and 14-bit ITU-N adjacent point codes.

After the necessary procedures shown in this step have been performed, or if you do not wish to specify the parameters shown in this list for the linkset, continue the procedure by performing one of these steps.

- If the `slsocbit` parameter will be specified for the linkset, continue the procedure with 4.
- If the `tfatcabmlq` parameter will be specified for the linkset and the `slsocbit` parameter will not be specified for the linkset, continue the procedure with 6.
- If the linkset type of an ANSI linkset is being changed, and the `slsocbit` and `tfatcabmlq` parameters will not be specified for the linkset, continue the procedure with 9.
- If the `slsocbit` and `tfatcabmlq` parameters will not be specified for the new linkset, and the linkset type of an ANSI linkset will not be changed, continue the procedure with 10.

4. To use the `slsocbit` parameter with either the `chg-ls` command, the Use of the Other **CIC** Bit feature must be on.

   Enter the `rtrv-feat`command to verify that either of this feature is on. The entry `SLSOCB = on` in the `rtrv-feat`command output shows that this feature is on. In this example, the Use of the Other **CIC**Bit feature is off

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, refer to `rtrv-feat` command description in *Commands User's Guide*.

   If the Use of the Other CIC Bit feature is off (`SLSOCB = off`), continue the procedure with 5.

If the Use of the Other CIC Bit feature is on (`SLSOCB = on`), continue the procedure by performing one of these steps.

- If the `tfatcabmlq` parameter will be specified for the linkset and the `slsocbit` parameter will not be specified for the linkset, continue the procedure with 6.
- If the linkset type of an ANSI linkset is being changed, and the `tfatcabmlq` parameter will not be specified for the linkset, continue the procedure with 9.
- If the `tfatcabmlq` parameter will not be specified for the new linkset, and the linkset type of an ANSI linkset will not be changed, continue the procedure with 10.

5. Turn the Use of the Other **CIC** Bit feature is on feature on by entering this command.

   `chg-feat:slsocb=on`

   > **Note:**
   >
   > Once the Use of the Other **CIC** Bit feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The Use of the Other **CIC** Bit feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the Use of the Other **CIC** Bit feature, contact your Oracle Sales Representative or Account Representative.

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0
   CHG-FEAT: MASP A - COMPLTD
   ```

   Continue the procedure by performing one of these steps.

   - If the `tfatcabmlq` parameter will be specified for the linkset and the `slsocbit` parameter will not be specified for the linkset, continue the procedure with 6.
   - If the linkset type of an ANSI linkset is being changed, and the `tfatcabmlq` parameter will not be specified for the linkset, continue the procedure with 9.
   - If the `tfatcabmlq` parameter will not be specified for the new linkset, and the linkset type of an ANSI linkset will not be changed, continue the procedure with 10.

6. If the linkset type of the linkset (shown in the `LST` column in the `rtrv-ls` output) is `C`, or will be changed to `C` in this procedure, the linkset's `tfatcabmlq` parameter value can be changed only if the `LSRESTRICT`**SS7** option is `ON`.

   If the linkset's `tfatcabmlq` parameter value is being changed, or if the linkset type will be changed to C, continue the procedure with 7.

If the linkset's `tfatcabmlq` parameter value is not being changed, or if the linkset type will be changed to or will remain (if unchanged) A, B, D, or E, continue the procedure by performing one of these steps.

- If the linkset type of an ANSI linkset is being changed, continue the procedure with 9.
- If the linkset type of an ANSI linkset is not being be changed, continue the procedure with 10.

> **Note:**
>
> The linkset type of a proxy linkset (`LST=PRX`) cannot be changed. If the linkset is a proxy linkset, continue the procedure with 10.

7. Display the existing value for the `lsrestrict` parameter by entering the `rtrv-ss7opts` command.

   This is an example of the possible output.

```
rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0
SS7 OPTIONS
-----------------------
LSRESTRICT          off
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, refer to the `rtrv-ss7opts` command description in *Commands User's Guide*.

If the `lsrestrict` parameter value shown in this step is `off`, continue the procedure with 8.

If the `lsrestrict` parameter value shown in this step is `on`, continue the procedure by performing one of these steps.

- If the linkset type of an ANSI linkset is being changed, continue the procedure with 9.
- If the linkset type of an ANSI linkset is not being be changed, continue the procedure with 10.

8. Change the value of the `lsrestrict` parameter to `on` by entering this command.

   `chg-ss7opts:lsrestrict=on`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-07 00:22:57 GMT  EAGLE5 40.0.0
CHG-SS7OPTS: MASP A - COMPLTD
```

> **Caution:**
>
> Turning the `lsrestrict` option on changes the way the **EAGLE** routes messages by using the state of the route along with the cost of the route to determine the preferred route to use. With this option on, the preferred route is not the absolute lowest cost available route in the routeset. A route is considered available if its status is either Allowed or **Restricted**. If the state of the absolute lowest cost route in the routeset is **Restricted**, the preferred route is the lowest cost route in the routeset whose status is Allowed. Make sure that you wish to have the **EAGLE** route messages in this manner before turning the `lsrestrict` option on.

Continue the procedure by performing one of these steps.

- If the linkset type of an ANSI linkset is being changed, continue the procedure with 9.
- If the linkset type of an ANSI linkset is not being be changed, continue the procedure with 10.

9. If the linkset type of the ANSI linkset is being changed, and the linkset is assigned to a route whose DPC is a cluster point code or a network routing point code, the new linkset type must be either B, C, or D. Display the routes that the linkset is assigned to by entering the `rtrv-rte` command with the lsn parameter and the name of the linkset that is being changed.

   For this example, enter this command.

   `rtrv-rte:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 08-12-01 19:58:14 EST  40.0.0
LSN           DPC           RC
ls04          003-003-*     1
              003-003-004   1
              003-003-006   1
              003-003-007   1
```

10. Deactivate the signaling links in the linkset using the `dact-slk` command.

    For this example, enter these commands.

    `dact-slk:loc=1205:link=b`

    `dact-slk:loc=1207:link=b`

    `dact-slk:loc=1211:link=a`

    `dact-slk:loc=1213:link=b`

    `dact-slk:loc=2105:link=b`

    `dact-slk:loc=2111:link=a`

    `dact-slk:loc=2113:link=b`

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 08-12-07 08:41:12 GMT  EAGLE5 40.0.0
Deactivate Link message sent to card
```

11. Change the linkset database using the `chg-ls` command. Use Table 3-12 as a guide for the parameters that can be specified with the `chg-ls` command.

Table 3-12 Changing a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code
Mandatory Parameter			
:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>
Optional Parameters			
:apc/apca=<the ANSI adjacent point code of the linkset> See Notes 1, 2, and 18.	:apci=<the ITU-I adjacent point code of the linkset> See Notes 1, 2, and 18.	:apcn=<the ITU-N adjacent point code of the linkset> See Notes 1, 2, and 18.	:apcn24=<the ITU-N24 adjacent point code of the linkset> See Notes 1, 2, and 18.
:lst=<a, b, c, d, e> See Notes 15 and 19.	:lst=<a, b, c, d, e> See Note 15.	:lst=<a, b, c, d, e> See Note 15.	:lst=<a, b, c, d, e> See Note 15.
:clli=<the CLLI value>	:clli=<the CLLI value>	:clli=<the CLLI value>	:clli=<the CLLI value>
:bei=<yes, no>	:bei=<yes, no>	:bei=<yes, no>	:bei=<yes, no>
:scrn=<the name of the Gateway Screening screen set> See Note 3.	:scrn=<the name of the Gateway Screening screen set> See Note 3.	:scrn=<the name of the Gateway Screening screen set> See Note 3.	:scrn=<the name of the Gateway Screening screen set> See Note 3.
:gwsa=<on, off> See Notes 4 and 5.	:gwsa=<on, off> See Notes 4 and 5.	:gwsa=<on, off> See Notes 4 and 5.	:gwsa=<on, off> See Notes 4 and 5.
:gwsm=<on, off> See Notes 4 and 5.	:gwsm=<on, off> See Notes 4 and 5.	:gwsm=<on, off> See Notes 4 and 5.	:gwsm=<on, off> See Notes 4 and 5.
:gwsd=<on, off> See Notes 4 and 5.	:gwsd=<on, off> See Notes 4 and 5.	:gwsd=<on, off> See Notes 4 and 5.	:gwsd=<on, off> See Notes 4 and 5.
:l3tset=1	:l3tset=1	:l3tset=1	:l3tset=1
:asl8=<yes, no> See Note 6.	:mtprse=<yes, no> See Note 12.	:mtprse=<yes, no> See Note 12.	:mtprse=<yes, no> See Note 12.
:slsci=<yes, no> See Note 6.	:slsocbit=<5 - 16, none> See Notes 14 and 20.	:slsocbit=<5 - 16, none> See Notes 14 and 20.	:slsocbit=<5 - 16, none> See Notes 14 and 20.
:mtprse=<yes, no> See Note 12.	:slsrsb=<1 - 4> See Note 20.	:slsrsb=<1 - 4> See Note 20.	:slsrsb=<1 - 4> See Note 20.
:sltset=<1 - 20>	:sltset=<1 - 20>	:sltset=<1 - 20>	:sltset=<1 - 20>
:nis=<on, off>	:nis=off	:nis=<on, off>	:nis=<on, off>

Table 3-12 (Cont.) Changing a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code
:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 13.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 13.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 13.	:gttmode=<sysdflt, cd, acdcd, cgacdcd, acdcgcd, acdcdcg, cgcd, cdcg, cg, fcd, fcg, fcdfcg, fcgfcd> See Note 13.
:spc/spca=<the ANSI secondary point code> See Notes 8 and 9.	:spci=<the ITU-I secondary point code> See Notes 8 and 9.	:spcn=<the ITU-N secondary point code> See Notes 8 and 9.	:spcn24=<the ITU-N24 secondary point code> See Notes 8 and 9.
:tfatcabmlq=< 0 - 16> See Notes 15 and 16.	:tfatcabmlq=< 0 - 16> See Notes 15 and 16.	:tfatcabmlq=< 0 - 16> See Notes 15 and 16.	:tfatcabmlq=< 0 - 16> See Notes 15 and 16.
:nlsn=< new linkset name>	:nlsn=< new linkset name>	:nlsn=< new linkset name>	:nlsn=< new linkset name>
:cggtmod=<yes, no> See Note 10.	:cggtmod=<yes, no> See Note 10.	:cggtmod=<yes, no> See Note 10.	:cggtmod=<yes, no> See Note 10.
:islsrsb=<1 - 8> See Note 11.	:islsrsb=<1 - 4> See Note 11.	:islsrsb=<1 - 4> See Note 11.	:islsrsb=<1 - 4> See Note 11.
:randsls=<all, class0, off> See Note 7.	:itutfr=<on, off>	:itutfr=<on, off>	:itutfr=<on, off>
	:multgc=<yes, no> See Note 17.	:multgc=<yes, no> See Note 17.	:multgc=<yes, no> See Note 17.
	:randsls=<all, class0, off> See Note 7.	:randsls=<all, class0, off> See Note 7.	:randsls=<all, class0, off> See Note 7.
		:apcntype=<itun, itunchina>	:apcntype=<itun, itunchina>

Table 3-12 (Cont.) Changing a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code

Notes:

a. The adjacent point code must be a full point code, cannot be an alias point code, and must be shown in the `rtrv-dstn` output. This is shown in Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset. Private point codes cannot be used as an adjacent point code in this procedure. Private point codes can be assigned only to IPGWx linksets. The procedures for configuring IPGWx linksets are in *Database Administration - IP7 User's Guide*.

b. The adjacent point code cannot be shown in the `rtrv-sid` output as the system's point code or any capability point codes - shown in Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset.

c. If a gateway screening screen set is assigned to the linkset, the gateway screening screen set must be in the database – shown in Verifying the Gateway Screening Configuration for a Linkset.

d. The `gwsa`, `gwsm`, and `gwsd` parameters can be specified only if the `scrn` parameter is specified.

> **Caution:**
>
> When Gateway Screening is in the screen test mode, as defined by the linkset parameters `gwsa=off` and `gwsm=on`, the gateway screening action in the gateway screening stop action set specified by the actname parameter of the gateway screening screen set at the end of the gateway screening process will be performed.

e. The `gwsd=on` parameter can be specified only with the `gwsa=on` parameter.

f. Refer to Table 3-9 for the combinations of the `asl8` and `slsci` parameters, and the slscnv STP option, and the results that these combinations produce. The `asl8` and `slsci` values for two linksets that are in a combined linkset should be the same.

g. It is recommended that when configuring `randsls` values on two linksets that are in a combined linkset that the `randsls` values for these linksets are the same. If these values are not the same, undesired SLS distribution of the traffic on these linksets may result.

h. The `spc/spca/spci/spcn/spcn24` parameter can be specified only if the Multiple Linksets to Single PC feature is enabled and turned on.

i. A linkset may not contain both secondary point codes (`spc/spca/spci/spcn/spcn24`) and proxy point codes (`ppc/ppca/ppci/ppcn/ppcn24`).

j. The `cggtmod` parameter can be specified only if either the AMGTT or AMGTT CgPA Upgrade feature is enabled.

k. The `islsrsb` parameter can be specified only if the SLS Bit Rotation by Incoming Linkset feature is enabled. If you wish to use the values 6, 7, or 8 for the `islsrsb` parameter of an ANSI linkset, the `rsls8` value for the linkset must be `yes`. Perform Configuring the RSLS8 Value for ANSI Linksets to change the `rsls8` value for the linkset to `yes`.

l. The `mtprse` parameter can be specified only if the ANSI or ITU MTP Restart feature is turned on.

Table 3-12 (Cont.) Changing a Linkset Parameter Combinations

ANSI Adjacent Point Code	ITU-I Adjacent Point Code	ITU-N Adjacent Point Code	ITU-N24 Adjacent Point Code

m. The `gttmode` parameter can be specified only if the Origin-Based SCCP Routing feature is enabled and turned on, or the Flexible Linkset Optional Based Routing feature is enabled and turned on. If the value for this parameter will be `cg`, `acdcd`, `acdcgcd`, `acdcdcg`, `cgacdcd`, `cgcd`, or `cdcg`, the Origin-Based SCCP Routing feature must be enabled and turned on. If the value for this parameter will be `fcd`, `fcg`, `fcgfcd`, or `fcdfcg`, the Flexible Linkset Optional Based Routing feature must be enabled and turned on.

n. The `slsocbit` parameter can be specified only if the SLSOCB feature is turned on.

o. If the `lst=c` parameter is specified, or if the current (unchanged) lst value for the linkset is `c`, the `tfatcabmlq` parameter cannot be specified unless the `LSRESTRICT` value shown in the `rtrv-ss7opts` output is `on`.

p. The value of the `tfatcabmlq` parameter cannot exceed the number of signaling links assigned to the linkset.

q. The `multgc=yes` parameter can be specified in this procedure only if the signaling links in the linkset are assigned to the IPLIMI application, and only for linksets with ITU-I or 14-bit ITU-N APCs.

r. If the adjacent point code is being changed, the point code type of the new adjacent point code must be the same as the current adjacent point code. For example, if the current adjacent point code is an ITU-I point code, the new adjacent point code must be an ITU-I point code.

s. If the linkset type of the ANSI linkset is being changed, and the linkset is assigned to a route whose DPC is a cluster point code or a network routing point code, the new linkset type must be either B, C, or D.

t. When two linksets are used as a combined linkset, both linksets should use the same `slsrsb` and `slsocbit` values.

For this example, enter these commands.

`chg-ls:lsn=ls04:apca=240-070-000:scrn=scr7:gwsa=on:nis=on`

`chg-ls:lsn=lsn5:apcn=10685:itutfr=on:randsls=class0`

When each of these commands has successfully completed, this message should appear.

```
rlghncxa03w 08-12-07  08:38:45 GMT  EAGLE5 40.0.0
Link set table is ( 24 of 1024)  2% full
CHG-LS:  MASP A - COMPLTD
```

12. Verify the changes using the `rtrv-ls` command, specifying the linkset name that was changed in 11.

For this example, enter these commands.

`rtrv-ls:lsn=ls04`

This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0
```

```
                            L3T SLT                 GWS GWS GWS
LSN           APCA    (SS7)   SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls04          240-070-000   scr7 1   1   no  a   4    on  off off yes   on

          CLLI         TFATCABMLQ MTPRSE ASL8
          ls04clli     2          no     no

          RANDSLS
          off

          ISLSRSB RSLS8
          1       no

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

                             L2T               PCR   PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1    N2
          1205  b    0   LIMDS0   1    56000  BASIC ---   -----
          1213  b    1   LIMDS0   1    56000  BASIC ---   -----
          1211  a    2   LIMDS0   1    56000  BASIC ---   -----
          1207  b    3   LIMDS0   1    56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

```
rtrv-ls:lsn=lsn5
```

This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                            L3T SLT                 GWS GWS GWS
LSN           APCN    (SS7)   SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5          10685         scr3 1   1   no  a   3    on  off off ---   on

          CLLI         TFATCABMLQ MTPRSE ASL8
          lsn5clli     1          no     ---

          SLSOCBIT SLSRSB RANDSLS ITUTFR ICNIMAP     OGNIMAP
          none     1      class0  on     itun2ituns  ituns2itun

          ISLSRSB
          1

          IPSG  IPGWAPC  GTTMODE           CGGTMOD
          no    no       CdPA                no

                             L2T               PCR   PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1    N2
          1206  b    0   LIMDS0   1    56000  BASIC ---   -----
          1214  b    1   LIMDS0   1    56000  BASIC ---   -----
```

```
          1212  a    2   LIMDS0   1    56000  BASIC ---  -----

Link set table is ( 24 of 1024)  2% full
```

13. Activate the signaling links that were deactivated in 10 using the `act-slk` command.

    For this example, enter these commands.

    `act-slk:loc=1205:link=b`

    `act-slk:loc=1207:link=b`

    `act-slk:loc=1211:link=a`

    `act-slk:loc=1213:link=b`

    `act-slk:loc=2105:link=b`

    `act-slk:loc=2111:link=a`

    `act-slk:loc=2113:link=b`

    When each of these commands have successfully completed, this message should appear.

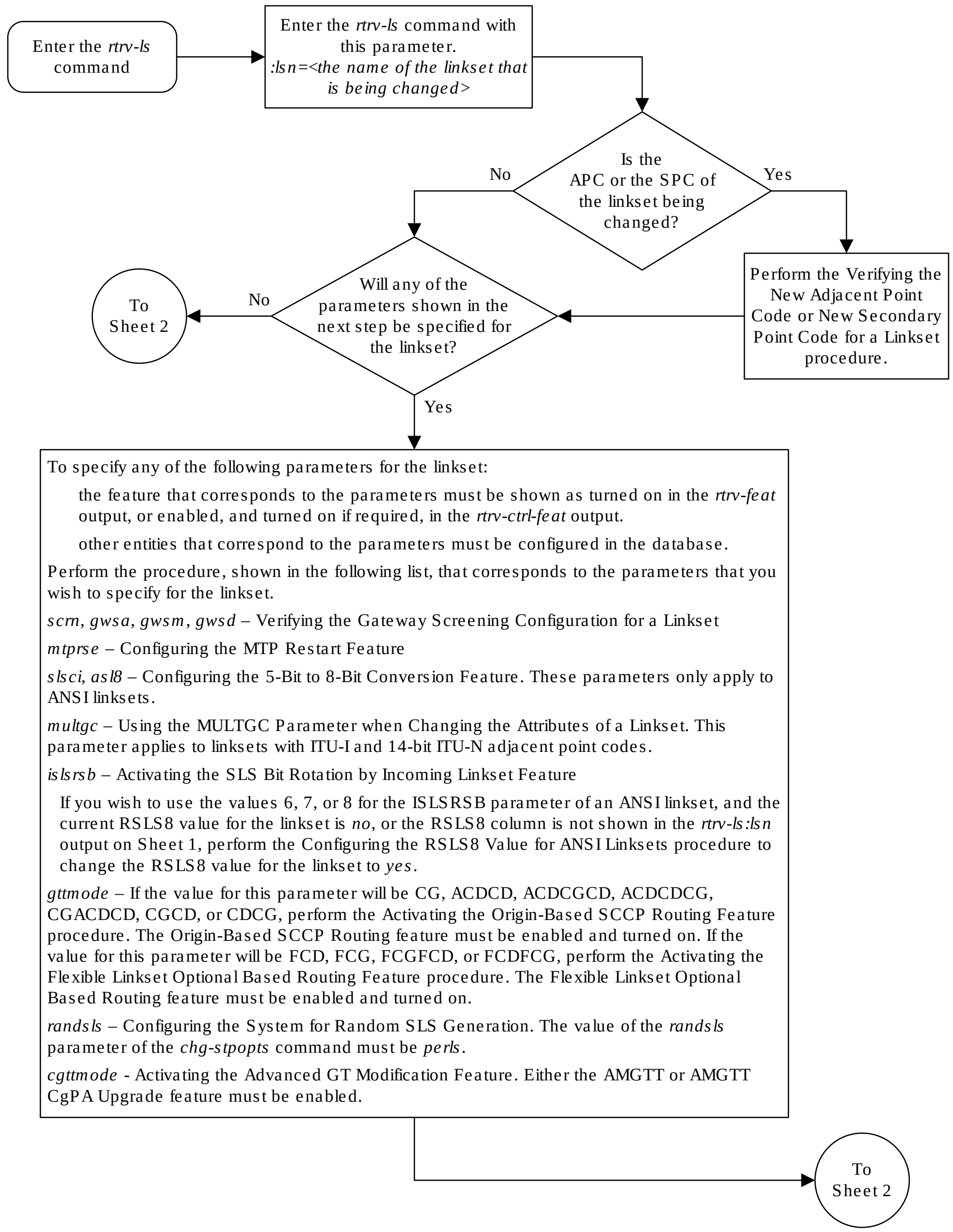
    ```
    rlghncxa03w 08-12-07 08:41:12 GMT  EAGLE5 40.0.0
    Activate Link message sent to card
    ```

14. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

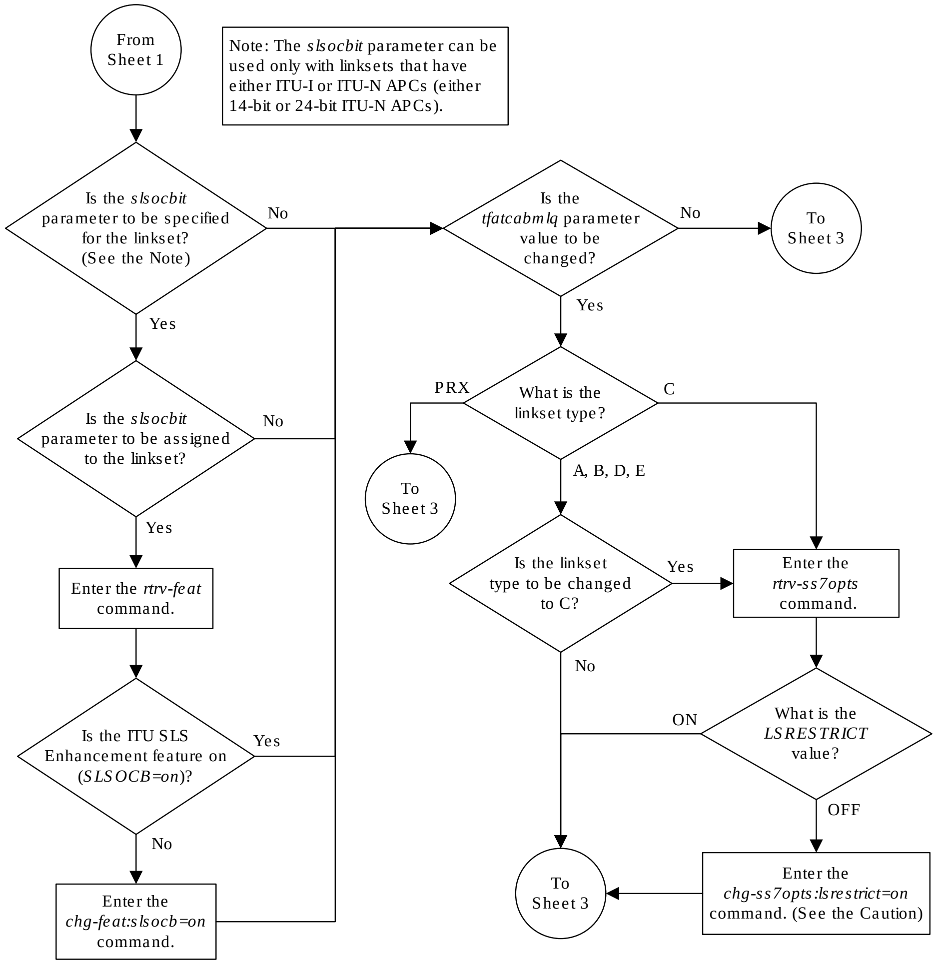
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

    ```
    BACKUP (FIXED) : MASP A - Backup starts on active MASP.
    BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
    complete.
    BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
    BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
    complete.
    ```

Figure 3-12 Changing an SS7 Linkset

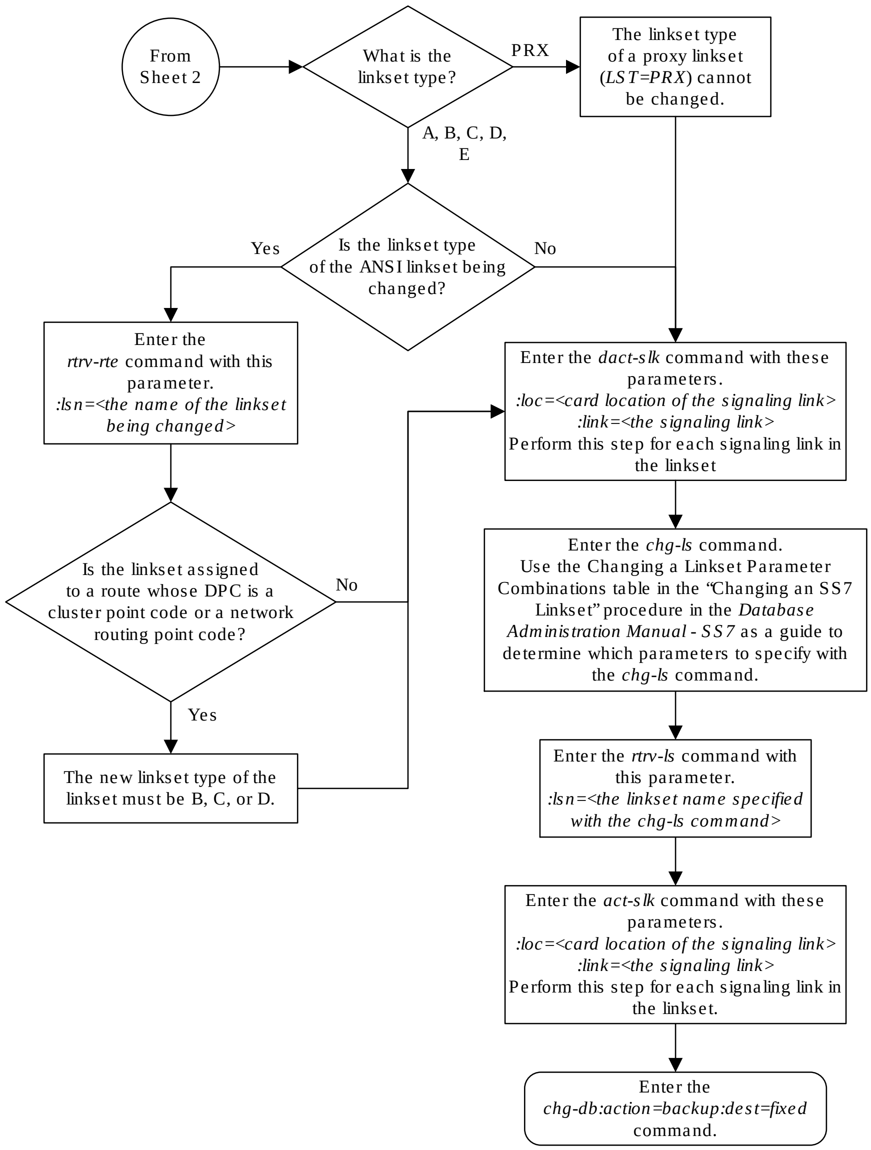


Sheet 1 of 3



Caution: Turning the *lsrestrict* option on changes the way the EAGLE 5 ISS routes messages by using the state of the route along with the cost of the route to determine the preferred route to use. With this option on, the preferred route is not the absolute lowest cost available route in the routeset. A route is considered available if its status is either Allowed or Restricted. If the state of the absolute lowest cost route in the routeset is Restricted, the preferred route is the lowest cost route in the routeset whose status is Allowed. Make sure that you wish to have the EAGLE 5 ISS route messages in this manner before turning the *lsrestrict* option on.

Sheet 2 of 3



Sheet 3 of 3

3.15 Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset

This procedure is used to verify that the new adjacent point code or new secondary point code for a linkset whose attributes are being changed is in the database.

If the linkset is a proxy linkset (linkset type PRX), the APC and linkset type of the linkset cannot be changed. A secondary point code and a secondary adjacent point code cannot be specified for a proxy linkset.

If the adjacent point code (**APC**) is changed, the new APC must be in the destination point code table and must be defined as a true point code in the destination point code table and cannot be an alias point code. The domain and point code type of the new APC must be the same as the APC being changed. For example, if the current adjacent point code is an **ITU**-I point code, the new adjacent point code must be an ITU-I point code. The new APC of the linkset cannot match the self **ID** of the EAGLE. The new APC must be a full point code and cannot be a cluster point code or a network routing point code.

Linksets containing **E1 ATM** signaling links cannot contain 24-bit ITU-N APCs or **SAPCs**. E1 ATM signaling links are identified by the value `LIME1ATM` in the `TYPE` column of the `rtrv-ls:lsn=<linkset name>` output.

Use the `rtrv-dstn` command to verify that the new APC is in the destination point code table and to verify the domain of the new APC. If the new APC is not shown in the `rtrv-dstn` command output, perform Adding a Destination Point Code to add the APC to the destination point code table.

To provision more than one linkset with the same APC, the Multiple Linksets to Single Adjacent PC feature must be enabled and turned on. The database can contain a maximum of six linksets that have the same APC. If the linkset is not a proxy linkset (linkset types A, B, C, D, or E), a secondary point code (shown in the `rtrv-spc` output) must be specified with the linkset. The network type and format of the secondary point code must be the same as the APC of the linkset. Secondary point codes can also be assigned to the APC of the linkset when the point code is provisioned in the database with the `ent-dstn` or `chg-dstn` commands. The secondary point codes that are assigned to the linksets that have the same APC must be unique for each linkset and cannot be the same as the secondary point code that is assigned to the APC of the linksets.

The secondary point code that is assigned to a linkset can be removed from the linkset by specifying the value `none` for the `spc/spca/spci/spcn/spcn24` parameter. A secondary point code can be removed from only one of the linksets in a group of linksets that have the same APC.

Canceling the `RTRV-LS` and `RTRV-DSTN` Commands

Because the `rtrv-ls` and `rtrv-dstn` commands used in this procedure can output information for a long period of time, the `rtrv-ls` and `rtrv-dstn` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` and `rtrv-dstn` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered, from another terminal other that the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to

enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands Manual*.

1. Perform one of the following steps.

   The APC and linkset type for a proxy linkset (`LST=PRX`) cannot be changed. A secondary point code and a secondary adjacent point code cannot be specified for a proxy linkset. If the attributes of a proxy linkset (`LST=PRX`) are being changed, This procedure is finished.

   If you wish to change the APC of a linkset to an APC that is assigned to another linkset and multiple linksets with the same APC are shown in the `rtrv-ls` output, continue the procedure with 3. If multiple linksets with the same APC are not shown in the `rtrv-ls` output, continue the procedure with 2.

   If you wish to change the secondary point code that is assigned to a linkset and multiple linksets with the same APC are shown in the `rtrv-ls` output, continue the procedure with 3. If multiple linksets with the same APC are not shown in the `rtrv-ls` output, continue the procedure with 2.

   If you wish to change the APC of a linkset to an APC that is not assigned to another linkset or do not wish to change the secondary point code that is assigned to a linkset, output, continue the procedure with 12.

2. Verify whether or not the Multiple Linksets to Single Adjacent PC feature is enabled and turned on by entering this command.

   `rtrv-ctrl-feat:partnum=893017901`

   This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
Multiple Linkset to APC   893019701 on     ----


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the Multiple Linksets to Single Adjacent PC feature is not enabled or turned on, perform Activating the Multiple Linksets to Single Adjacent PC (MLS) Feature to enable and turn on this feature. After this feature has been enabled and turned on, and the APC of the linkset is being changed, continue the procedure with 3. If only the secondary point code that is assigned to the linkset is being changed, continue the procedure with 4.

If the Multiple Linksets to Single Adjacent PC feature is enabled and turned on, and the APC of the linkset is being changed, continue the procedure with 3. If only the secondary point code that is assigned to the linkset is being changed, continue the procedure with 4.

3. A maximum of six linksets can be assigned to an APC. Verify the number of linksets that are assigned to the new APC of the linkset that is being changed by entering the `rtrv-ls` command with the new APC of the linkset. For this example, enter this command.

   `rtrv-ls:apca=002-002-002`

   This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

APCA   =    002-002-002

                                 L3T SLT              GWS GWS GWS
LSN           SPCA          SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn2          001-001-002   none 1   1   no  A   2    off off off
no    off
lsn40         020-020-021   none 1   1   no  A   2    off off off
no    off
lsn41         021-021-021   none 1   1   no  A   2    off off off
no    off
lsn42         022-022-022   none 1   1   no  A   3    off off off
no    off


Link set table is (29 of 1024) 3% full.
```

   If six linksets are shown in this step, choose another APC for the linkset from the `rtrv-ls` output 1 (in Changing an SS7 Linkset) and repeat this step.

   If one to five linksets are shown in this step, continue this procedure with 4.

4. Display the linkset that is being changed by entering the `rtrv-ls` command with the name of the linkset. For this example, enter this command.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls04          001-002-003   scr2 1   1   no  a   4    off off off
yes   off

              SPCA          CLLI          TFATCABMLQ MTPRSE ASL8
           ---------------- -----------   2          ---    no
```

```
          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

                                 L2T             PCR   PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1    N2
          1205  b    0   LIMDS0   1    56000  BASIC ---   -----
          1213  b    1   LIMDS0   1    56000  BASIC ---   -----
          1211  a    2   LIMDS0   1    56000  BASIC ---   -----
          1207  b    3   LIMDS0   1    56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

To use the APC displayed in 3, the secondary point code assigned to the linkset shown in this step cannot be shown in 3, unless the secondary point code that is assigned to the linkset shown in this step is changed. If you wish to change the secondary point code assigned to linkset shown in this step, continue the procedure with 6.

If you do not wish to change the secondary point code assigned to linkset shown in this step, choose another APC for the linkset from the `rtrv-ls` output in 1 (in Changing an SS7 Linkset) and repeat this procedure from2.

If the secondary point code assigned to the linkset shown in this step is not shown in 3, continue the procedure with 5.

5. Display the new APC of the linkset by entering the `rtrv-dstn` command with the new APC of the linkset specified in 3. For this example, enter this command.

   `rtrv-dstn:dpca=002-002-002`

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 11:43:04 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   002-002-002   ----------- no  --- ----------       --------------   SS7

   SPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   020-020-020  ---- no      none   off   none     no     no    none

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

   To use the APC displayed in this step, the secondary point code assigned to the linkset shown in 4cannot be shown in this step, unless the secondary point code that is assigned to the linkset shown in this step is changed. If you wish to change the secondary point code assigned to the linkset shown in this step, continue the procedure with 6.

   If you do not wish to change the secondary point code assigned to the linkset shown in this step, choose another APC for the linkset from the `rtrv-ls` output in 1 (in Changing an SS7 Linkset) and repeat this procedure from2.

   If the secondary point code assigned to the linkset shown in 4 is not shown in this step, the new APC for the linkset can be used. However, the secondary point code that is assigned to the linkset can also be changed. If you wish to change the secondary point code and the APC, continue the procedure with 6. If you only wish to change the APC of the linkset, continue the procedure with 13.

6. To change the secondary point code that is assigned to the linkset, verify the secondary point code by displaying the linkset that is being changed by entering the `rtrv-ls` command with the name of the linkset. For this example, enter this command.

   > **Note:**
   >
   > If 4 was performed, this step does need to be performed.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                  L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls04           001-002-003    scr2 1   1   no  a   4    off off off
yes   off

               SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  2          ---    no

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

                                   L2T                PCR   PCR
          LOC   LINK SLC TYPE      SET  BPS    ECM    N1    N2
          1205  b    0   LIMDS0    1    56000  BASIC ---   -----
          1213  b    1   LIMDS0    1    56000  BASIC ---   -----
          1211  a    2   LIMDS0    1    56000  BASIC ---   -----
          1207  b    3   LIMDS0    1    56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

   If a secondary point code is not assigned to the linkset, continue the procedure with 8.

   If a secondary point code is assigned to the linkset, the secondary point code can be changed to another secondary point code value or can be removed from the linkset. If you wish to change the secondary point code to another secondary point code value, continue the procedure with 8. If you wish to remove the secondary point code value from the linkset, continue the procedure with 7.

7. Only one linkset can be assigned to an APC that does not have a secondary point code. Verify the secondary point codes of the linksets that are assigned to the APC specified in 6 by entering the `rtrv-ls` command with the APC of the linkset specified in 6. For this example, enter this command.

   `rtrv-ls:apca=001-002-003`

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

APCA    =    001-002-003

                                  L3T SLT               GWS GWS GWS
LSN           SPCA           SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls04       ---------------- scr2 1   1   no  a   4    off off off yes
off

Link set table is (29 of 1024) 3% full.
```

If one linkset is shown in this step that does not have a secondary point code, then no secondary point codes can be removed from any of the linksets shown in this step. The secondary point code value can be changed to another secondary point code value. If you wish to change the secondary point code value to another secondary point code value, continue the procedure with 8.

If all the linksets shown in this step have a secondary point code, then the secondary point code from one of these linksets can be removed. If the APC of the linkset is also being changed (3, 4,5 were performed), continue the procedure with 13. If the APC of the linkset is not being changed, this procedure is finished..

8. Display the secondary point codes by entering the `rtrv-spc` command. This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
SPC (Secondary Point Codes)

SPCA
     020-020-020
     020-020-021
     021-021-021
     022-022-022
     026-026-026
     026-026-027
     026-026-028
     026-026-029
     200-010-000

SPC-I

none

SPC-N
        00002

SPC-N24

none
```

```
Secondary Point Code table is (10 of 40) 25% full.
```

If the desired secondary point code is shown in this step, continue the procedure with 9.

If the desired secondary point code is not shown in this step, perform Adding a Secondary Point Code to add the desired secondary point code. The network type of the new secondary point code must be the same as the APC of the linkset. If the APC of the linkset is being changed, after the secondary point code has been added, continue the procedure with 13. If the APC of the linkset is not being changed, after the secondary point code has been added, this procedure is finished..

9. Verify the secondary point codes of the linksets that are assigned to the APC specified in 6 by entering the `rtrv-ls` command with the APC of the linkset specified in 6. For this example, enter this command.

   `rtrv-ls:apca=001-002-003`

   This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

APCA    =     001-002-003

                                     L3T SLT              GWS GWS GWS
LSN            SPCA           SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls04        ---------------- scr2 1    1   no  a    4    off off off
yes   off

Link set table is (29 of 1024) 3% full.
```

10. Display the APC of the linkset by entering the `rtrv-dstn` command with the APC of the linkset specified in 9. For this example, enter this command.

    `rtrv-dstn:dpca=001-002-003`

    This is an example of the possible output.

```
rlghncxa03w 10-12-17 11:43:04 GMT EAGLE5 43.0.0

   DPCA           CLLI         BEI ELEI   ALIASI
ALIASN/N24    DMN
   001-002-003   ----------- no  --- ----------
--------------   SS7

   SPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  ---- no      none    off   none     no      no     none

Destination table is (37 of 2000) 2% full
Alias table is (0 of 12000) 0% full
PPC table is (13 of 20) 65% full
```

The new secondary point code that will be assigned to the linkset cannot be shown in the `rtrv-ls` output in 9 or in the `rtrv-dstn` output in this step. If the new secondary point code is not shown in 8 and 9, and the APC of the linkset is being changed, continue the procedure with 13. If the APC of the linkset is not being changed, and the new secondary point code is not shown in 8 and 9, this procedure is finished.

If the new secondary point code is shown in the `rtrv-ls` output in 9 or in the `rtrv-dstn` output in this step, this secondary point code value cannot be used. Repeat this procedure from 8 and choose another secondary point code value.

11. Display the point code and capability point code of the EAGLE by using the `rtrv-sid` command.

    This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

   PCA              PCI          PCN                 CLLI
PCTYPE

   001-001-001      1-200-6      13482               rlghncxa03w       OTHER

   CPCA
   002-002-002        002-002-003        002-002-004       002-002-005
   002-002-006        002-002-007        002-002-008       002-002-009
   004-002-001        004-003-003        144-212-003

   CPCA (LNP)
   005-005-002         005-005-004       005-005-005

   CPCI
   1-001-1            1-001-2            1-001-3           1-001-4

   CPCN
   02091              02092              02094              02097
   02191              02192              11177
```

12. Display the point codes in the destination point code table by using the `rtrv-dstn` command.

    This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   001-002-003   ls04clli    yes --- ----------     --------------     SS7
   002-002-100   ls01clli    no  --- ----------     --------------     SS7
   002-007-008   ls06clli    yes --- ----------     --------------     SS7
   002-009-003   --------    no  --- ----------     --------------     SS7
   002-250-010   --------    no  --- ----------     --------------     SS7
   003-003-003   ls03clli    yes --- ----------     --------------     SS7
   003-020-100   --------    no  --- ----------     --------------     SS7
   004-004-004   ls02clli    yes --- ----------     --------------     SS7
```

```
   004-030-200   --------    no  --- ----------
--------------    SS7
   009-002-003   --------    no  --- ----------
-------------     SS7
   179-100-087   --------    yes --- ----------
--------------    SS7
   200-050-176   --------    yes --- ----------
--------------    SS7
   240-007-000   --------    yes --- ----------
--------------    SS7
   240-012-004   rlghncbb001 yes ---    1-111-1
11111         SS7
   240-012-005   rlghncbb002 yes ---    1-112-2
11112         SS7
   240-012-006   rlghncbb003 yes ---    1-112-3
11113         SS7
   240-012-008   --------    yes ---    1-113-5
11114         SS7

   DPCI          CLLI        BEI ELEI   ALIASA
ALIASN/N24    DMN
   2-131-1       rlghncbb023 no  ---    222-210-000
12001         SS7
   2-131-2       --------    no  ---    222-211-001
12002         SS7
   2-131-3       --------    no  ---    222-211-002
12003         SS7
   3-150-4       lsi7clli    yes --- -------------
--------------    SS7

   DPCN          CLLI        BEI ELEI   ALIASA
ALIASI          DMN
   11520         lsn5clli    yes --- --------------
----------       SS7
   11211         rlghncbb013 no  ---    222-200-200
2-121-1       SS7
   11212         rlghncbb013 no  ---    222-200-201
2-121-2       SS7

Destination table is (22 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

If the adjacent point code is not shown in the `rtrv-dstn` command output, perform the Adding a Destination Point Code procedure to add the adjacent point code to the destination point code table. After the adjacent point code has been added, this procedure is finished.

If the adjacent point code is shown in the `rtrv-dstn` output, continue the procedure with 13.

13. The new APC of the linkset cannot be the DPC of any exception route.

    Verify that the new adjacent point code of the linkset is not the DPC of any exception route by entering the `rtrv-rtx` command with the `dpc/dpca/dpci/dpcn/ dpcn24` parameter. The `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` parameter value is the adjacent point code value that will be specified for the linkset. For this example, enter these commands.

`rtrv-rtx:dpca=240-070-000`

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
    DPCA           RTX-CRITERIA               LSN         RC     APC
    240-070-000    OPCA
                   007-008-009                e1e2        20     001-207-000

 DESTINATION ENTRIES ALLOCATED:   2000
     FULL DPC(s):                   13
     EXCEPTION DPC(s):               5
     NETWORK DPC(s):                 0
     CLUSTER DPC(s):                 1
     TOTAL DPC(s):                  19
     CAPACITY (% FULL):              1%
 ALIASES ALLOCATED:              12000
     ALIASES USED:                   0
     CAPACITY (% FULL):              0%
 X-LIST ENTRIES ALLOCATED:         500
```

`rtrv-rtx:dpcn=10685`

This is an example of the possible output.

```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0
    DPCN           RTX-CRITERIA               LSN         RC     APC
    10685          OPCN
                   6543                       lsn6        20     11211

 DESTINATION ENTRIES ALLOCATED:   2000
     FULL DPC(s):                   13
     EXCEPTION DPC(s):               5
     NETWORK DPC(s):                 0
     CLUSTER DPC(s):                 1
     TOTAL DPC(s):                  19
     CAPACITY (% FULL):              1%
 ALIASES ALLOCATED:              12000
     ALIASES USED:                   0
     CAPACITY (% FULL):              0%
 X-LIST ENTRIES ALLOCATED:         500
```

If the adjacent point code of the linkset is not the DPC of a route exception table entry, no entries are displayed in the `rtrv-rtx` output, but a summary of the point code quanties is displayed, as shown in the following output example.

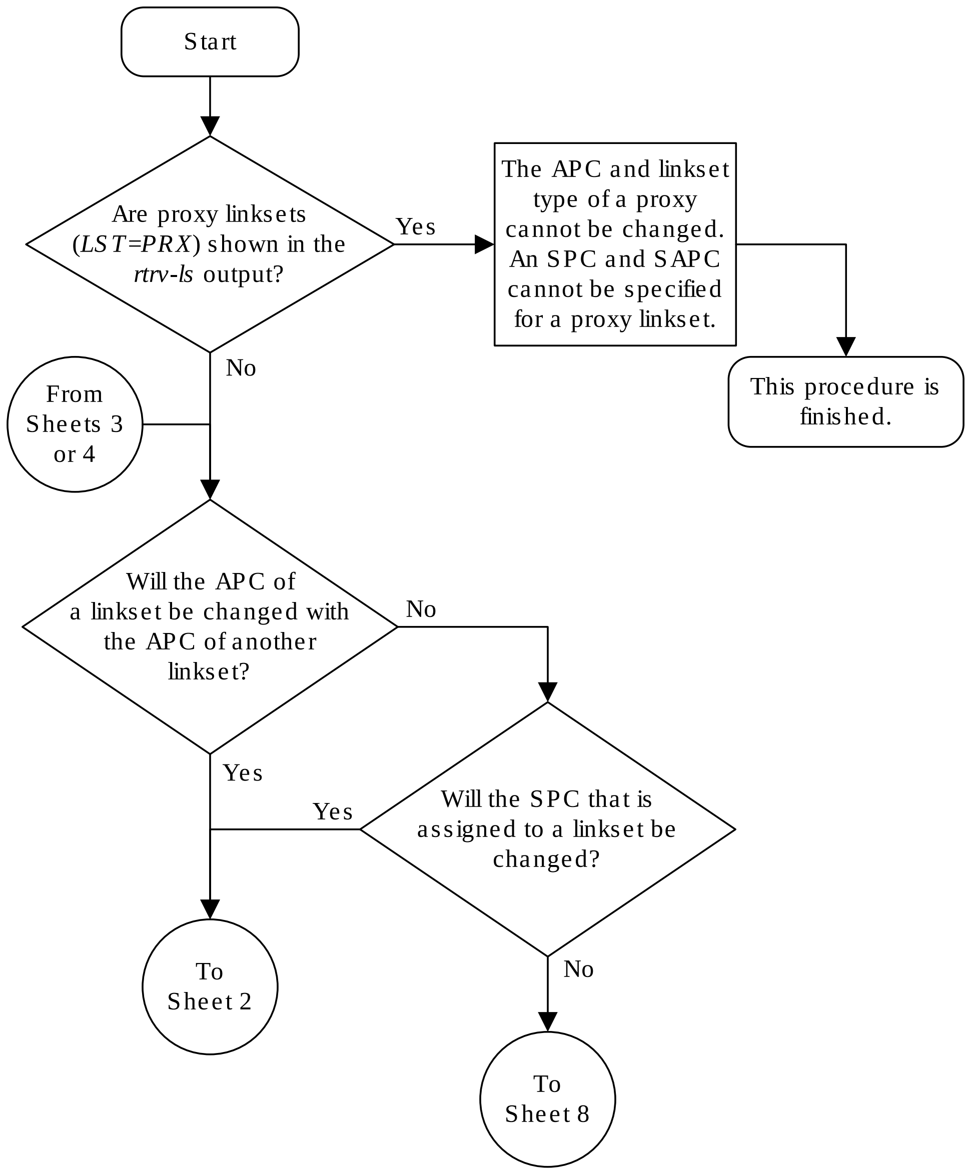
```
rlghncxa03w 08-12-17 11:43:04 GMT EAGLE5 40.0.0

    DESTINATION ENTRIES ALLOCATED:   2000
```

```
        FULL DPC(s):                  15
        EXCEPTION DPC(s):              5
        NETWORK DPC(s):                0
        CLUSTER DPC(s):                1
        TOTAL DPC(s):                 21
        CAPACITY (% FULL):             1%
    ALIASES ALLOCATED:             12000
        ALIASES USED:                  0
        CAPACITY (% FULL):             0%
    X-LIST ENTRIES ALLOCATED:        500
```

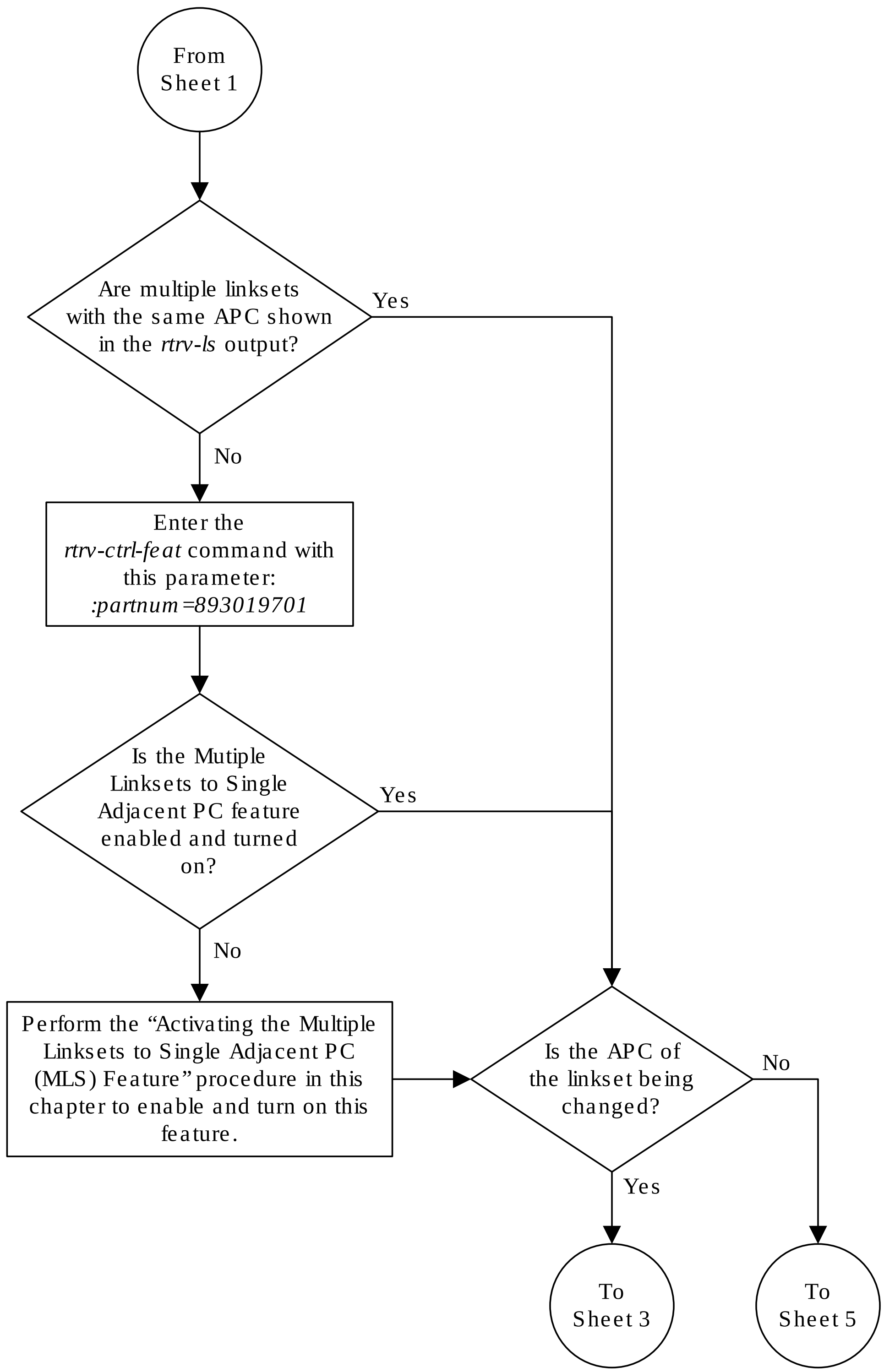
If the point code specified in this step is shown in the `DPCA` column in this step, the point code value cannot be used as an adjacent point code unless one of two actions are taken:

a. Choose another adjacent point code value and repeat 11, 12, and 13.
b. Remove all the entries displayed in this step by performing Removing a Route Exception Entry. After the route exception entires have been removed, this procedure is finished.

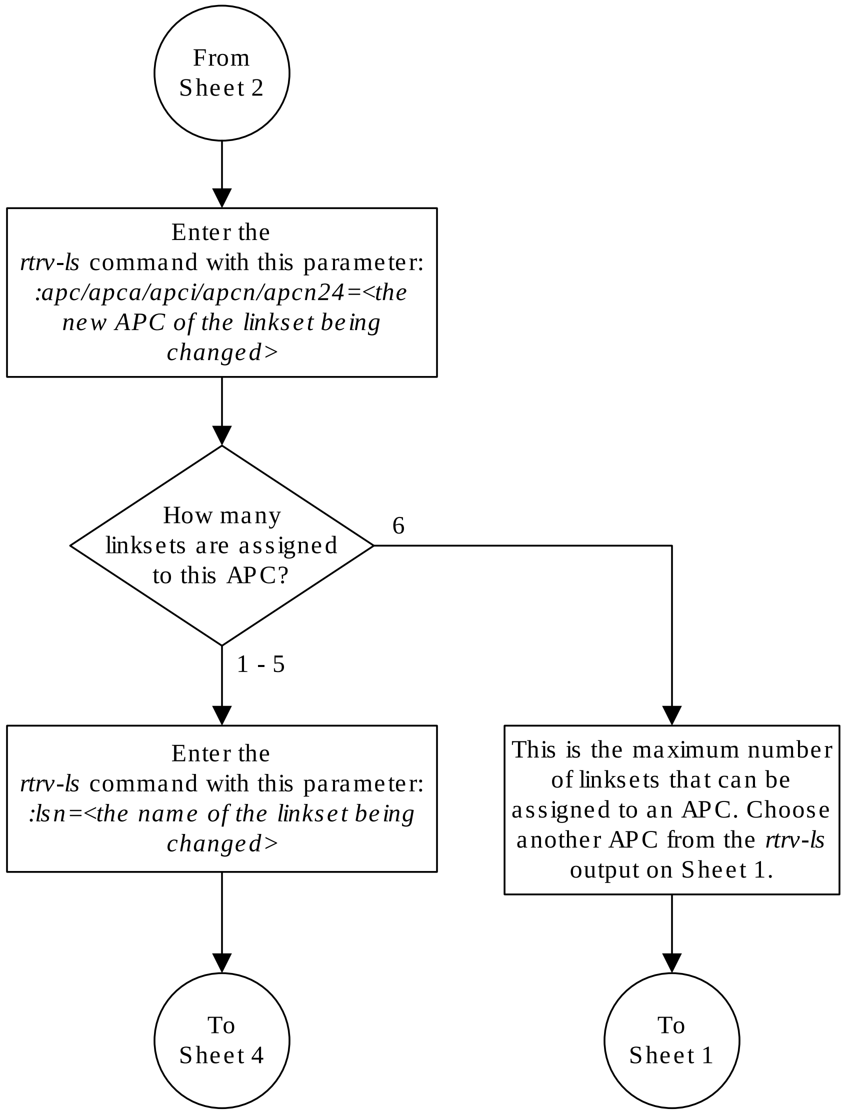
Figure 3-13 Verifying the New Adjacent Point Code or New Secondary Point Code for a Linkset



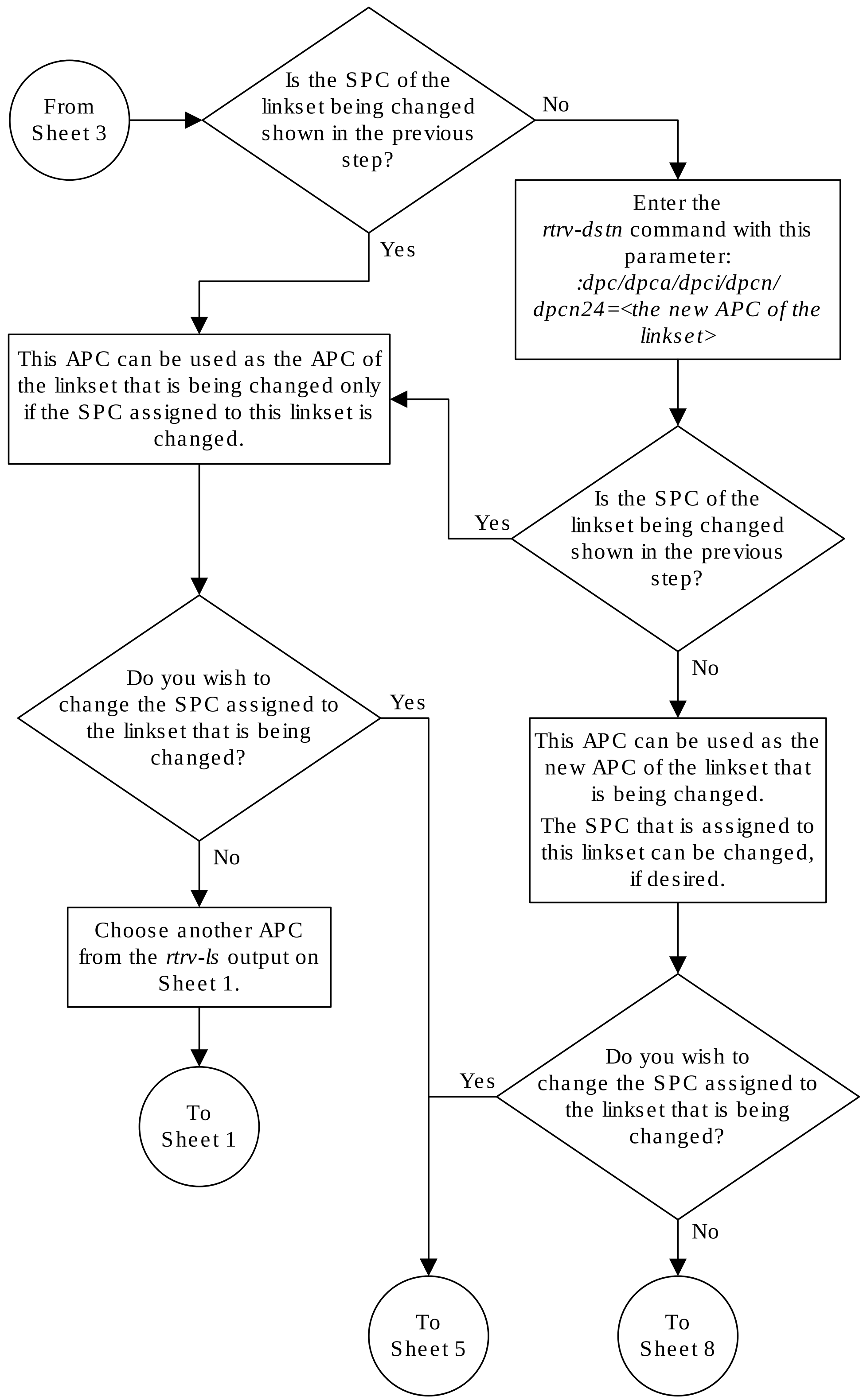
Sheet 1 of 8


From Sheet 1
Are multiple linksets with the same APC shown in the rtrv-ls output?
Yes
No
Enter the rtrv-ctrl-feat command with this parameter: :partnum=893019701
Is the Mutiple Linksets to Single Adjacent PC feature enabled and turned on?
Yes
No
Perform the "Activating the Multiple Linksets to Single Adjacent PC (MLS) Feature" procedure in this chapter to enable and turn on this feature.
Is the APC of the linkset being changed?
No
Yes
To Sheet 3
To Sheet 5

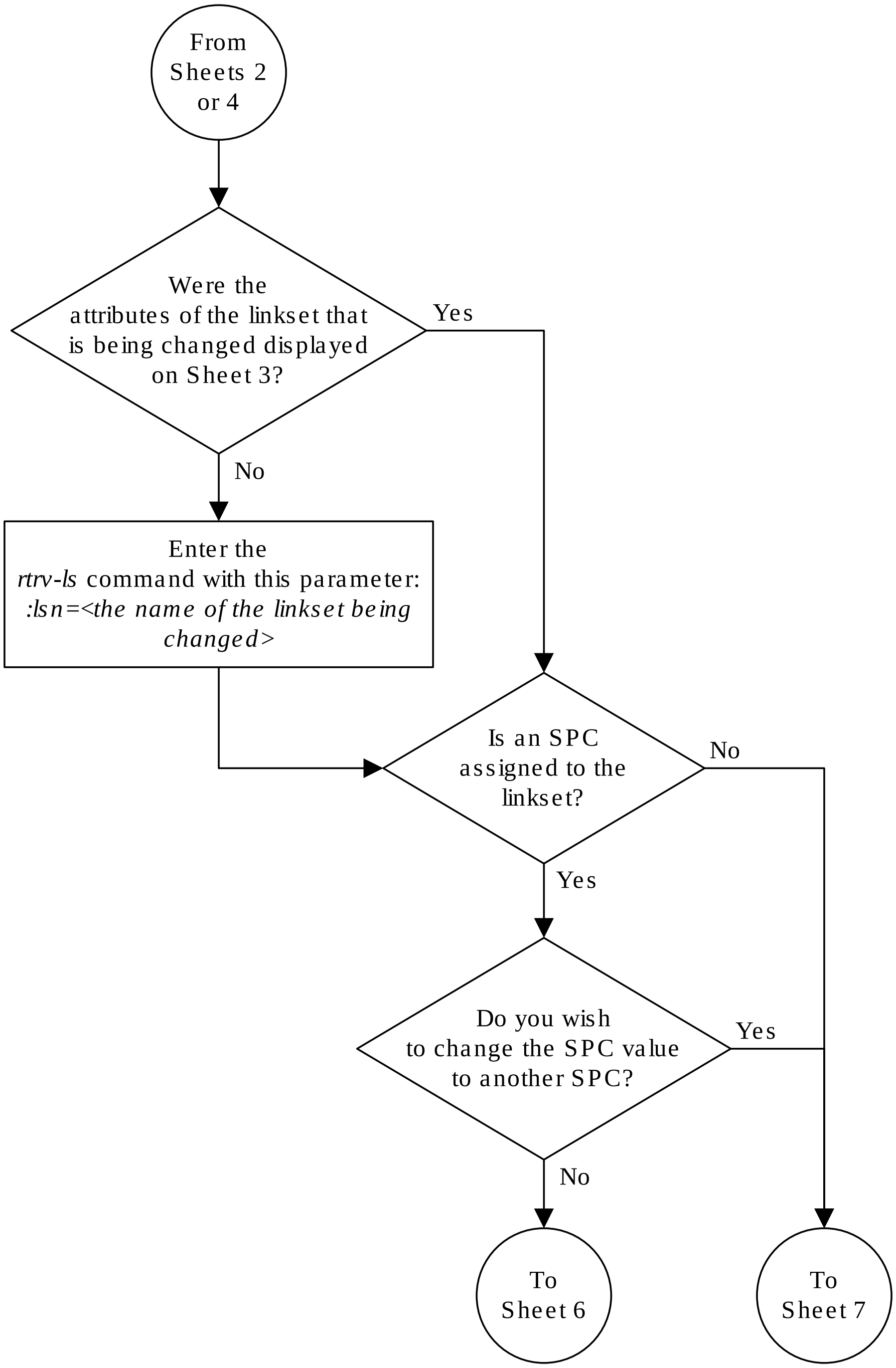
Sheet 2 of 8


From
Sheet 2
Enter the
rtrv-ls command with this parameter:
:apc/apca/apci/apcn/apcn24=<the new APC of the linkset being changed>
How many linksets are assigned to this APC?
6
1 - 5
Enter the
rtrv-ls command with this parameter:
:lsn=<the name of the linkset being changed>
This is the maximum number of linksets that can be assigned to an APC. Choose another APC from the *rtrv-ls* output on Sheet 1.
To
Sheet 4
To
Sheet 1

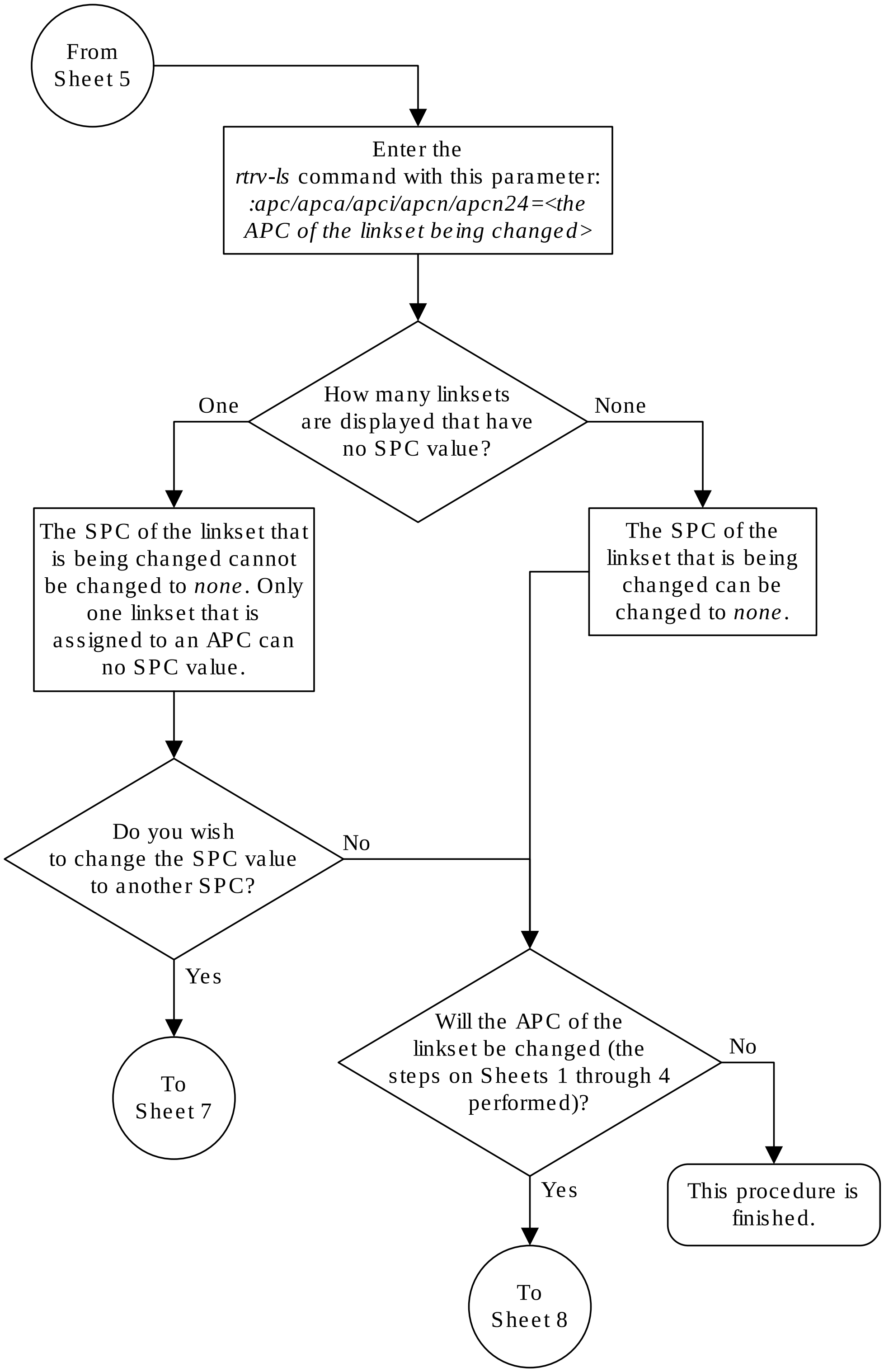
Sheet 3 of 8


From Sheet 3
Is the SPC of the linkset being changed shown in the previous step?
No
Yes
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca/dpci/dpcn/ dpcn24=<the new APC of the linkset>*
This APC can be used as the APC of the linkset that is being changed only if the SPC assigned to this linkset is changed.
Is the SPC of the linkset being changed shown in the previous step?
Yes
No
Do you wish to change the SPC assigned to the linkset that is being changed?
Yes
No
This APC can be used as the new APC of the linkset that is being changed.
The SPC that is assigned to this linkset can be changed, if desired.
Choose another APC from the *rtrv-ls* output on Sheet 1.
To Sheet 1
Do you wish to change the SPC assigned to the linkset that is being changed?
Yes
No
To Sheet 5
To Sheet 8

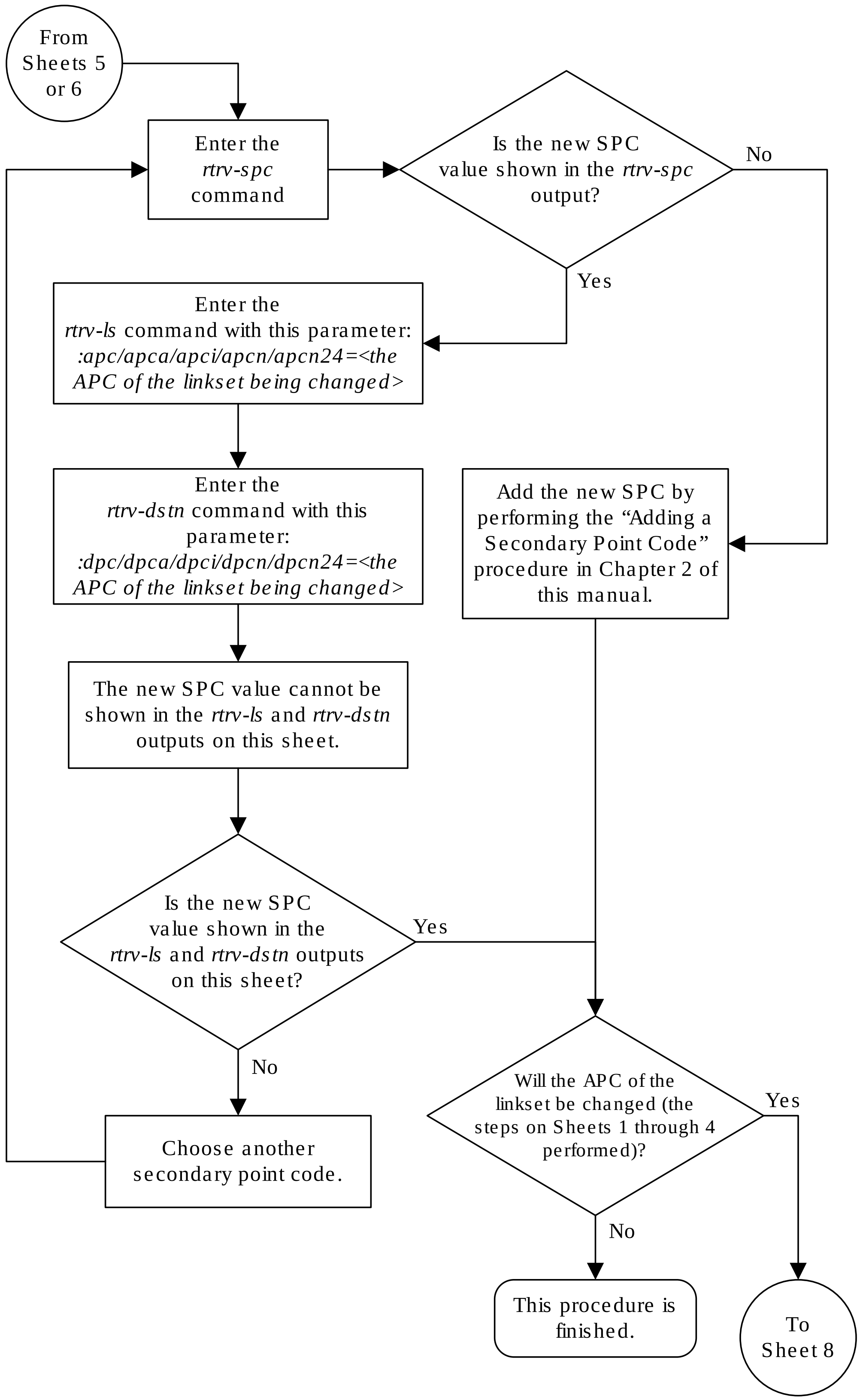
Sheet 4 of 8


From Sheets 2 or 4
Were the attributes of the linkset that is being changed displayed on Sheet 3?
Yes
No
Enter the rtrv-ls command with this parameter: :lsn=<the name of the linkset being changed>
Is an SPC assigned to the linkset?
No
Yes
Do you wish to change the SPC value to another SPC?
Yes
No
To Sheet 6
To Sheet 7

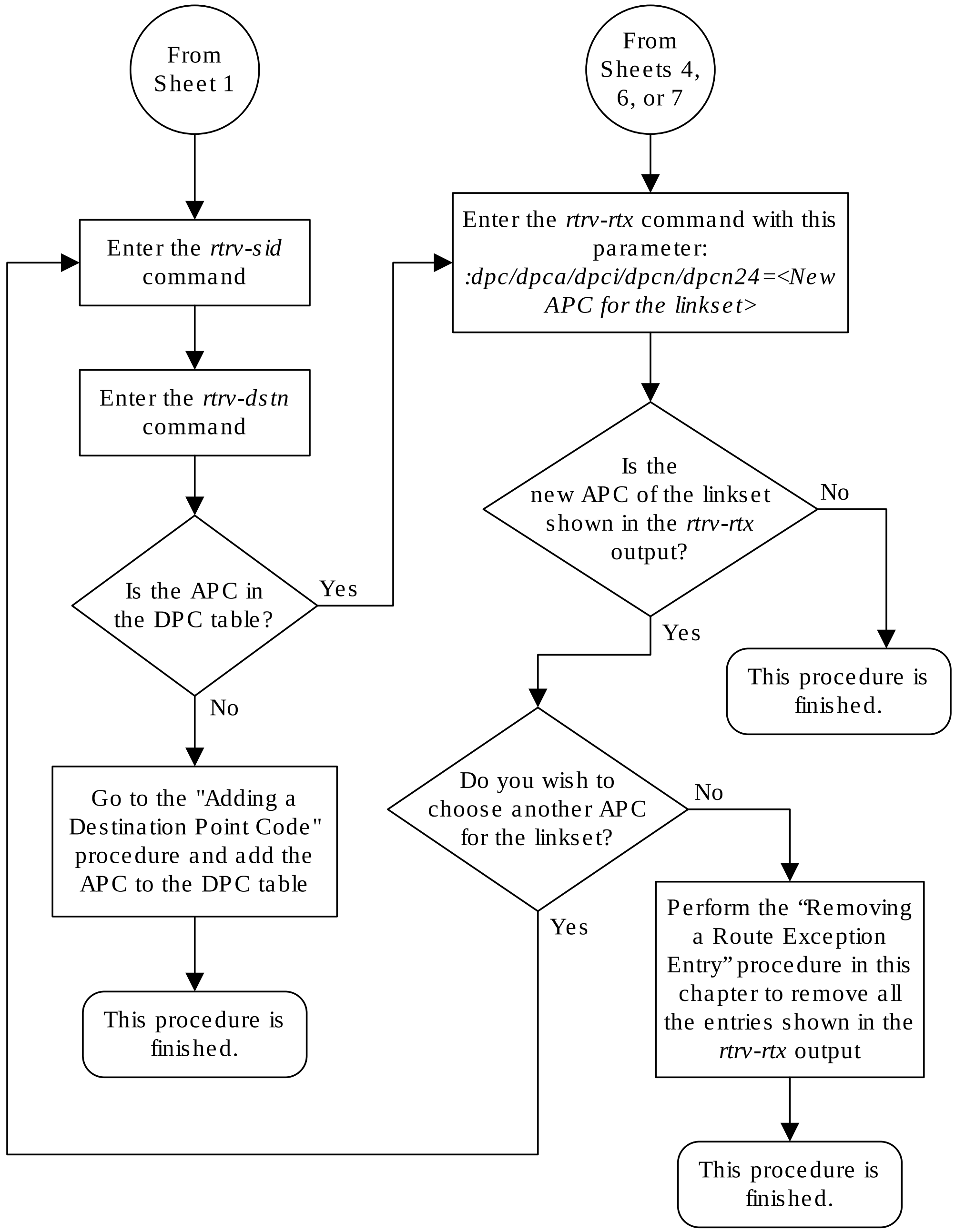
Sheet 5 of 8


From Sheet 5
Enter the *rtrv-ls* command with this parameter: *:apc/apca/apci/apcn/apcn24=<the APC of the linkset being changed>*
How many linksets are displayed that have no SPC value?
One
None
The SPC of the linkset that is being changed cannot be changed to *none*. Only one linkset that is assigned to an APC can no SPC value.
The SPC of the linkset that is being changed can be changed to *none*.
Do you wish to change the SPC value to another SPC?
No
Yes
To Sheet 7
Will the APC of the linkset be changed (the steps on Sheets 1 through 4 performed)?
No
Yes
This procedure is finished.
To Sheet 8

Sheet 6 of 8


From Sheets 5 or 6
Enter the *rtrv-spc* command
Is the new SPC value shown in the *rtrv-spc* output?
No
Yes
Enter the *rtrv-ls* command with this parameter: *:apc/apca/apci/apcn/apcn24=<the APC of the linkset being changed>*
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca/dpci/dpcn/dpcn24=<the APC of the linkset being changed>*
Add the new SPC by performing the "Adding a Secondary Point Code" procedure in Chapter 2 of this manual.
The new SPC value cannot be shown in the *rtrv-ls* and *rtrv-dstn* outputs on this sheet.
Is the new SPC value shown in the *rtrv-ls* and *rtrv-dstn* outputs on this sheet?
Yes
No
Choose another secondary point code.
Will the APC of the linkset be changed (the steps on Sheets 1 through 4 performed)?
Yes
No
This procedure is finished.
To Sheet 8

Sheet 7 of 8



Note: If the adjacent point code is being changed, the point code type of the new adjacent point code must be the same as the current adjacent point code.

For example, if the current adjacent point code is an ITU-I point code, the new adjacent point code must be an ITU-I point code.

Private point codes cannot be used as an adjacent point code in this procedure. Private point codes can be assigned only to IPGWx linksets. The procedures for configuring IPGWx linksets are in the *Database Administration Manual - IP^7 Secure Gateway*.

Sheet 8 of 8

3.16 Using the MULTGC Parameter when Changing the Attributes of a Linkset

This procedure is used to verify that the following items are configured in the database.

- The ITU Duplicate Point Code feature is turned on.
- If the `multgc` parameter value is being changed to `no`, and the linkset contains more than one 14-bit ITU-N secondary adjacent point code, all but one of these secondary adjacent point codes must be removed from the linkset.

The `multgc` parameter only applies to linksets whose adjacent point codes are either **ITU** international point codes or 14-bit **ITU** national point codes. All the signaling links in this linkset must be assigned to cards running the **IPLIMI** or `IPGWI` applications, or the linkset must be an IPSG M2PA linkset. The linkset cannot be a proxy linkset.

Canceling the `RTRV-LS` Command

Because the `rtrv-ls` command used in this procedure can output information for a long period of time, the `rtrv-ls` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` command was entered, from another terminal other that the terminal where the `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands User's Guide*.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                    L3T SLT                GWS GWS GWS
LSN            APCA    (SS7)   SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2           001-207-000     none 1   1   no  B    6    off off off
no     off
e1m1s1         001-001-001     none 1   1   no  A    7    off off off
```

```
no    off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off no
off
ls04          001-002-003   scr2 1   1   no  a   4    off off off yes
off
ls1305        000-005-000   none 1   1   no  A   1    off off off no
off
ls1307        000-007-000   none 1   1   no  A   1    off off off no
off

                                 L3T SLT              GWS GWS GWS
LSN           APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none 1   1   no  B   4    off off off ---   on
ls1315        0-015-0       none 1   1   no  A   1    off off off ---
off
ls1317        0-017-0       none 1   1   no  A   1    off off off ---   on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off ---
off

                                 L3T SLT              GWS GWS GWS
LSN           APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn4          11520-aa      scr3 1   1   no  a   3    on  off off ---   on
lsn5          11211-aa      scr3 1   1   no  a   1    on  off off ---   on

Link set table is (10 of 1024) 1% full.
```

2. Display the current linkset configuration of the linkset to be changed using the `rtrv-ls` command with the linkset name.

   For this example, enter these commands.

   `rtrv-ls:lsn=lsn5`

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5          11211-aa      scr3 1   1   no  a   1    on  off off ---   on

              SPCN          CLLI        TFATCABMLQ MTPRSE ASL8
           ---------------- ----------- 1          no     ---

           SLSRSB RANDSLS MULTGC ITUTFR
           1      off     no     off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no
```

```
          LOC   LINK SLC TYPE      IPLIML2
          1105 A     0   IPLIMI    M2PA

         SAPCI
         5-005-5

         SAPCN
         11213-de
         12114-fr
         12115-uk

Link set table is ( 24 of 1024)  2% full
```

The `multgc` parameter can be specified only for linksets with either **ITU**-I or 14-bit **ITU**-N **APCs**. The linkset can contain only signaling links assigned to the **IPLIMI** or IPGWI applications, or must be an IPSG M2PA linkset. The linkset cannot be a proxy linkset; a linkset whose linkset type is PRX (`lst=prx`). If the shown in this step does not meet this criteria, the `multgc` parameter value for this linkset cannot be changed. This procedure is finished.

If the linkset does meet the criteria described in the previous paragraph, continue the procedure by performing one of these steps.

- To change the `multgc` parameter value, the ITU Duplicate Point Code feature must be turned on. If the `MULTGC` column is shown in the `rtrv-ls` output in this step, the ITU Duplicate Point Code feature is turned on. If the `MULTGC` column is not shown in the `rtrv-ls` output in this step, continue the procedure with 3.
- If the `MULTGC` column is shown in the `rtrv-ls` output in this step, and the `multgc` parameter value will be changed to `no`, continue the procedure with 5.
- If the `MULTGC` column is shown in the `rtrv-ls` output in this step, and the `multgc` parameter value will be changed to `yes`, this procedure is finished.

3. To specify the `multgc=yes` parameter with the `chg-ls` command, the **ITU** Duplicate **Point Code** feature must be on.

   For the **ITU**Duplicate **Point Code**feature to be on, the **Multiple Point Code**feature must be on. Enter the `rtrv-feat`command to verify that either of these features are on. The entry `MPC = on`in the `rtrv-feat`command output shows that the **Multiple Point Code**feature is on.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

4. Turn the **ITU** Duplicate **Point Code** feature on, and the **Multiple Point Code** feature if necessary, by entering one of these commands.
   - To turn the **ITU** Duplicate **Point Code** feature on only.

`chg-feat:ituduppc=on`

- To turn both the **ITU** Duplicate **Point Code** and **Multiple Point Code** features on.

  `chg-feat:mpc=on:ituduppc=on`

> **Note:**
>
> Once the **ITU** Duplicate **Point Code** and **Multiple Point Code** features are turned on with the `chg-feat` command, they cannot be turned off.
> The **ITU** Duplicate **Point Code** and **Multiple Point Code** features must be purchased before you turn either of these features on with the `chg-feat` command. If you are not sure if you have purchased these features, contact your Oracle Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-10 11:43:04 GMT  EAGLE5 36.0.0
CHG-FEAT: MASP A - COMPLTD
```

This procedure is finished.

5. If the `multgc` parameter value is changed to `no`, the linkset can contain only one secondary adjacent point code.

   An **ITU** international linkset can contain only one 14-bit **ITU** national secondary adjacent point code. If the **ITU** international linkset contains more than one 14-bit **ITU** national secondary adjacent point code, all but one of these 14-bit **ITU** national secondary adjacent point codes must be removed from the linkset. An **ITU** national linkset can contain only one **ITU** international secondary adjacent point code. All 14-bit **ITU**-N secondary adjacent point codes must be removed from the linkset. All routes to these secondary adjacent point codes must be removed from the database before the secondary adjacent point codes can be removed.

   Display the routes using the secondary adjacent point code being removed from the linkset with the `rtrv-rte` command, specifying the secondary adjacent point code being removed as the value of the `dpc` parameter.

   For this example, enter these commands.

   `rtrv-rte:dpcn=11213-de`

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
DPCN            ALIASA          ALIASI    LSN         RC     APC
11213-de      --------------- ---------- lsn5        10     11211-aa
                                                 RTX:No   CLLI=-----------
```

   `rtrv-rte:dpcn=12114-fr`

This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
DPCN              ALIASA         ALIASI    LSN        RC    APC
12114-fr      --------------- ---------- lsn5       10    12111-aa
                                                 RTX:No
CLLI=-----------
```

`rtrv-rte:dpcn=12115-uk`

This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
DPCN              ALIASA         ALIASI    LSN        RC    APC
12115-uk      --------------- ---------- lsn5       10    12111-aa
                                                 RTX:No
CLLI=-----------
```

If the secondary adjacent point code is assigned to a route, that route must be removed from the database. Perform Removing a Route to remove the route from the database.

6. Remove the secondary adjacent point codes specified in 5 from the linkset with the `chg-ls` command with the `sapcn` and the `action=delete` parameters.

   For this example, enter these commands.

   `chg-ls:lsn=lsn5:sapcn=11213-de:action=delete`

   `chg-ls:lsn=lsn5:sapcn=12114-fr:action=delete`

   `chg-ls:lsn=lsn5:sapcn=12115-uk:action=delete`

   When the `chg-ls` command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-17 16:23:21 GMT  EAGLE5 36.0.0
Link set table is ( 13 of 255)  5% full
CHG-LS: MASP A - COMPLTD
```

7. Verify that the SAPCs have been removed from the linkset by entering the `rtrv-ls` command with the name of the linkset specified in 6.

   For this example, enter these commands.

   `rtrv-ls:lsn=lsn5`

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
```

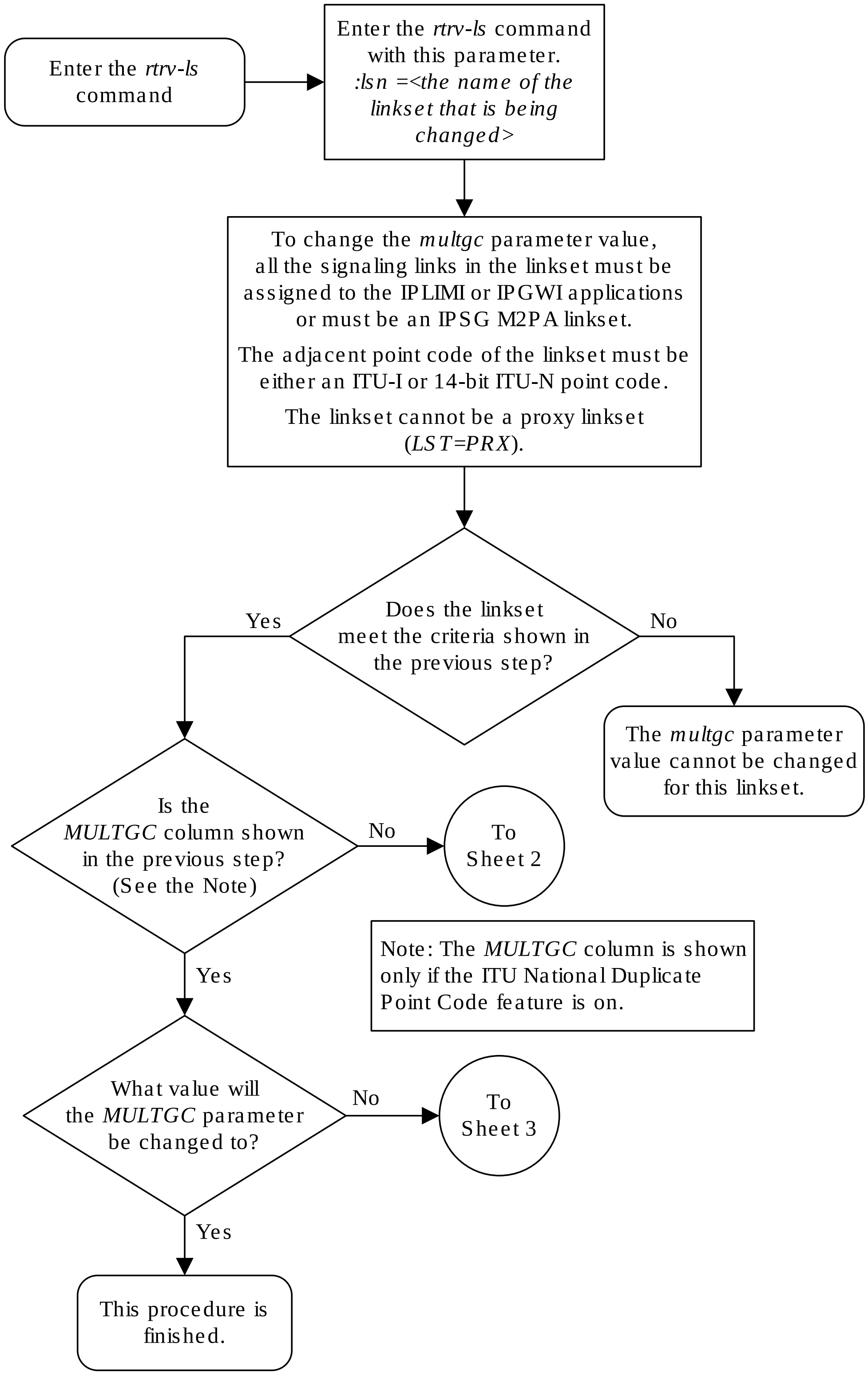
```
lsn5          11211-aa      scr3 1   1   no  a    1    on  off off ---   on

                 SPCN          CLLI         TFATCABMLQ MTPRSE ASL8
              ---------------- -----------  1          no     ---

              SLSRSB RANDSLS MULTGC ITUTFR
              1      off     no     off

              IPSG  IPGWAPC  GTTMODE           CGGTMOD
              no    no       CdPA               no

              LOC  LINK SLC TYPE     IPLIML2
              1105 A    0   IPLIMI   M2PA

             SAPCI
             5-005-5

Link set table is ( 24 of 1024)  2% full
```

8. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

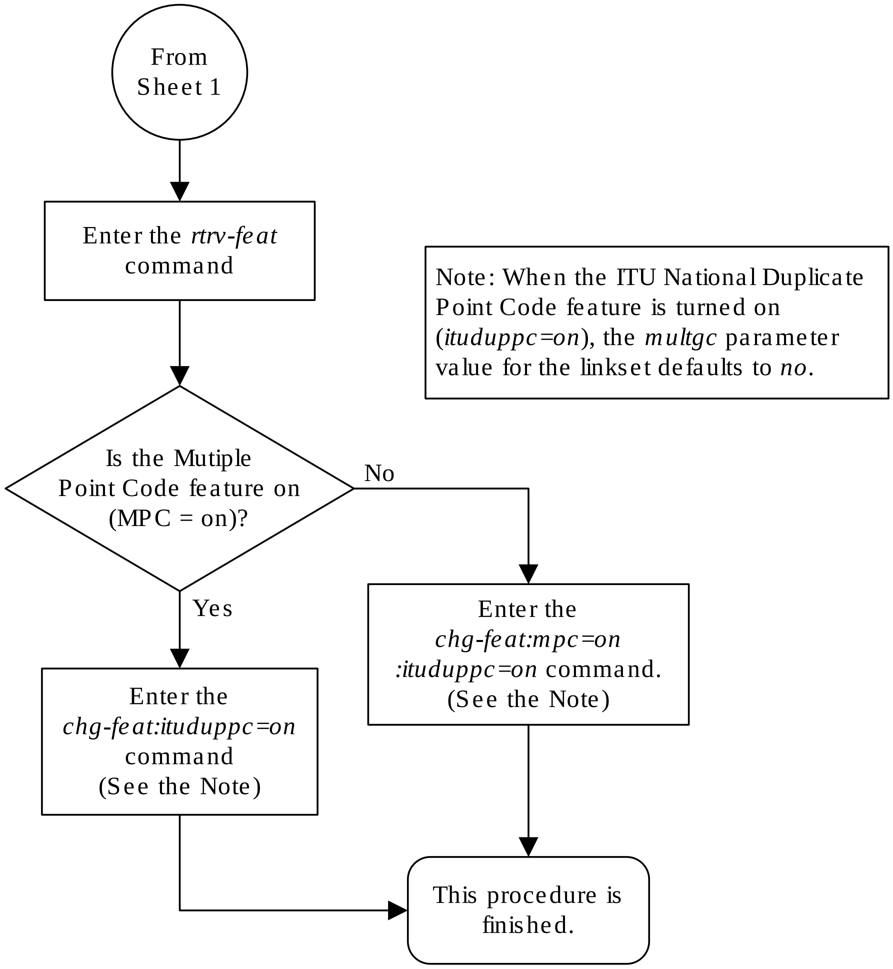
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

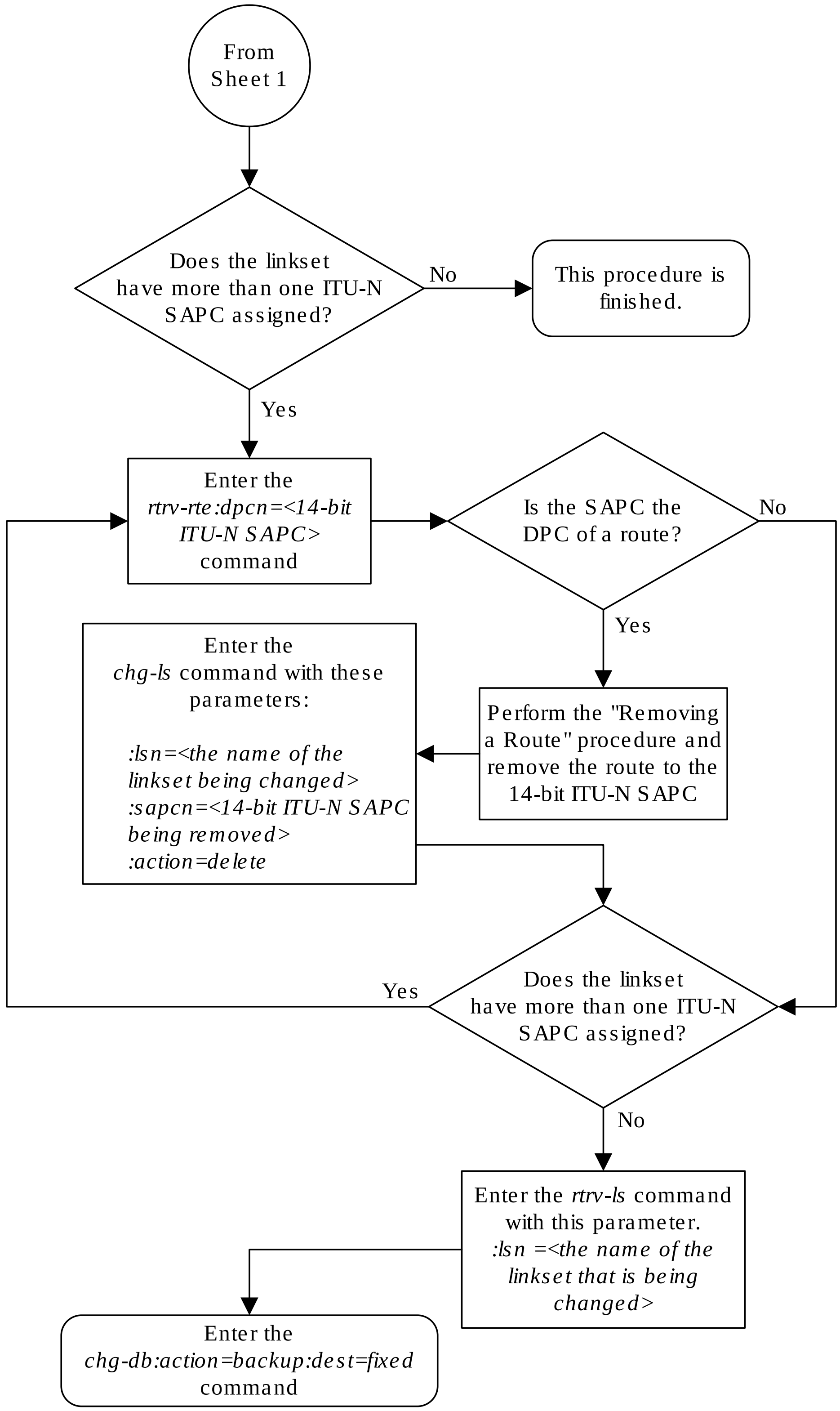
Figure 3-14 Using the MULTGC Parameter when Changing the Attributes of a Linkset



Sheet 1 of 3


From Sheet 1
Enter the *rtrv-feat* command
Note: When the ITU National Duplicate Point Code feature is turned on (*ituduppc=on*), the *multgc* parameter value for the linkset defaults to *no*.
Is the Mutiple Point Code feature on (MPC = on)?
No
Yes
Enter the *chg-feat:mpc=on :ituduppc=on* command. (See the Note)
Enter the *chg-feat:ituduppc=on* command (See the Note)
This procedure is finished.

Sheet 2 of 3


From Sheet 1
Does the linkset have more than one ITU-N SAPC assigned?
No
This procedure is finished.
Yes
Enter the *rtrv-rte:dpcn=<14-bit ITU-N SAPC>* command
Is the SAPC the DPC of a route?
No
Yes
Perform the "Removing a Route" procedure and remove the route to the 14-bit ITU-N SAPC
Enter the *chg-ls* command with these parameters:
:lsn=<the name of the linkset being changed>
:sapcn=<14-bit ITU-N SAPC being removed>
:action=delete
Does the linkset have more than one ITU-N SAPC assigned?
Yes
No
Enter the *rtrv-ls* command with this parameter.
:lsn =<the name of the linkset that is being changed>
Enter the *chg-db:action=backup:dest=fixed* command

Sheet 3 of 3

3.17 Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC)

This procedure is used to configure a secondary adjacent point code for **SS7 ITU** linksets using the `lsn`, `sapci`, `sapcn`, `sapcn24`, and `action` parameters of the `chg-ls` command. Only these parameters can be specified in this procedure. The `chg-ls` command contains other parameters.

These parameters are discussed in more detail in *Commands User's Guide* or in these sections.

- Changing an SS7 Linkset
- The "Configuring a Linkset for the GSM MAP Screening Feature" procedure in *Database Administration - Features User's Guide*.
- These procedures in *Database Administration - IP7 User's Guide*.
  - Configuring an IPGWx Linkset
  - Adding a Mate IPGWx Linkset to another IPGWx Linkset
  - Removing a Mate IPGWx Linkset from another IPGWx Linkset
  - Adding an IPSG M3UA Linkset
  - Addingn IPSG M2PA Linkset

> **Note:**
>
> A secondary adjacent point code cannot be assigned to a proxy linkset. A proxy linkset is a linkset whose linkset type is `PRX`. A secondary adjacent point code cannot be assigned to a linkset that contains an IPSG-M3UA linkset. An IPSG-M3UA linkset is a linkset that contains the `ipsg=yes` and `adapter=m3ua` parameter values.

The secondary adjacent point code is used to enhance the network management in the **ITU** international and **ITU** national nodes when messages from different countries to be routed over the same linkset.

The `lsn` parameter specifies the name of the linkset being changed.

The `sapci` parameter specifies the **ITU** international secondary adjacent point code.

The `sapcn` parameter specifies a 14-bit **ITU** national secondary adjacent point code.

The `sapcn24` parameter specifies a 24-bit **ITU** national secondary adjacent point code.

The `action` parameter specifies whether the secondary adjacent point code (`sacpi`, `sapcn`, or `sapcn24`) is being added (`action=add`) to the linkset or removed (`action=delete`) from the linkset.

While the `multgc` parameter is not specified with the `chg-ls` command in this procedure, in addition to specifying whether or not multiple group codes are supported for the linkset, its value does help determine how secondary adjacent point codes are configured in the linkset.

When this parameter value is `yes`, and the **APC** of the linkset is a 14-bit **ITU** national point code, the linkset can contain one 14-bit **ITU** national secondary adjacent point code for each group code in the **EAGLE**, and one **ITU** international secondary adjacent point code. If the **APC** of the linkset is **ITU** international, the linkset can contain either one 14-bit **ITU** national secondary adjacent point code for each group code in the **EAGLE**, or only one 24-bit **ITU** national secondary adjacent point code, but no **ITU** international secondary adjacent point codes.

If the **APC** of the linkset is a 24-bit **ITU** national point code, the linkset contains only one **ITU** international secondary adjacent point code.

If the `multgc` parameter value is `no`, the linkset can contain only one secondary adjacent point code. An **ITU** international linkset can contain either a 14-bit **ITU**-N point code or a 24-bit **ITU**-N point code. An **ITU** national linkset, a linkset containing either a 14-bit **APC** or a 24-bit **APC**, can contain only an **ITU** international secondary adjacent point code.

The secondary adjacent point codes must be defined in the destination point code table and can be assigned only to linksets with **ITU** international or **ITU** national adjacent point codes, except linksets containing **E1 ATM** signaling links cannot contain 24-bit **ITU** national secondary adjacent point codes. Secondary adjacent point codes can be non-spare, spare, private, or private spare point codes. Private and private spare point codes can be specified only for **IPGWI** linksets (linksets containing **IPGWI** signaling links).

The secondary adjacent point code parameters (`sacpi`, `sapcn`, or `sapcn24`) and the `action` parameter must be specified together.

You cannot delete an **SAPC** with the `action` parameter when routes exist for its **SS7** domain.

The values of the `multgc`, `sapci`, `sapcn`, and `sapcn24` parameters are only displayed in the `rtrv-ls` command output when a specific linkset is being displayed with the `rtrv-ls:lsn=<linkset name>` command.

This examples used in this procedure are based on the information shown in Table 3-13.

Table 3-13 Secondary Adjacent Point Code Configuration Table

Linkset Names	SAPCI	SAPCN	ACTION
lsi3	N/A	11212-ge	add
lsn5	4-75-7	N/A	add
lsn3	3-150-5	N/A	delete

Canceling the `RTRV-LS` and `RTRV-DSTN` Commands

Because the `rtrv-ls` and `rtrv-dstn` commands used in this procedure can output information for a long period of time, the `rtrv-ls` and `rtrv-dstn` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` and `rtrv-dstn` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered, from another terminal other that the terminal where the `rtrv-ls` or `rtrv-dstn` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current linkset configuration using the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2          001-207-000   none 1   1   no  B   6    off off off no
off
ls1305        000-005-000   none 1   1   no  A   1    off off off no
off
ls1307        000-007-000   none 1   1   no  A   1    off off off no
off
e1m1s1        001-001-001   none 1   1   no  A   7    off off off no
off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off no
off

                                 L3T SLT              GWS GWS GWS
LSN           APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none 1   1   no  B   4    off off off ---   on
ls1315        0-015-0       none 1   1   no  A   1    off off off ---
off
ls1317        0-017-0       none 1   1   no  A   1    off off off ---   on
e1m2s1        1-011-1       none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2       none 1   1   no  A   7    off off off ---
off
lsi3          1-111-3       scr3 1   3   yes c   1    off off off ---
---

                                 L3T SLT              GWS GWS GWS
LSN           APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
```

```
NIS
lsn3          11113-ge      scr3 1    3    yes c    1     on   off off
---   off
lsn5          10685-fr      scr1 1    3    yes a    1     off off off
---   off

Link set table is (10 of 1024) 1% full.
```

Note:

A secondary adjacent point code cannot be assigned to a proxy linkset. A proxy linkset is a linkset whose linkset type is `PRX`. Choose a linkset whose linkset type is not `PRX` and continue the procedure with 2.

2. Display the current linkset configuration of the linkset to be changed using the `rtrv-ls` command with the linkset name.

   For this example, enter this command.

   `rtrv-ls:lsn=lsi3`

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsi3          1-111-3        scr3 1    3   yes c    1    off off off
---   ---

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB
MULTGC
           -----------  1          no     ---  none     7       yes

           ITUTFR RANDSLS
           off    all

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           yes     ---------- 100   100     % 80       % CdPA

          LOC   LINK SLC TYPE
          1317  A    0   IPGWI

          SAPCN
          11211-uk
Link set table is ( 13 of 255)  5% full

rtrv-ls:lsn=lsn3
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn3           11113-ge       scr3 1   3   yes c   1    on  off off ---
off

          CLLI          TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
          -----------   1          no     ---  none     7      yes

          ITUTFR RANDSLS
          off    off

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCI
          3-150-5
          SAPCN
          11213-de
Link set table is ( 13 of 255)  5% full
```

```
rtrv-ls:lsn=lsn5
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5           10685-fr       scr1 1   3   yes a   1    off off off ---
off

          CLLI          TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
          -----------   1          no     ---  none     7      no

          ITUTFR RANDSLS
          off    off

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1201  A    0   IPLIMI   M2PA
```

```
Link set table is ( 13 of 255)  5% full
```

If 24-bit **ITU**-N secondary adjacent point codes are being added to the linkset, and the linkset specified in this step contains **E1 ATM** signaling links, choose another linkset from 1 and repeat this step. Linksets containing **E1 ATM** signaling links cannot have 24-bit **ITU**-N secondary adjacent point codes.

If the desired linkset is an IPSG-M3UA linkset, choose another linkset from 1 and repeat this step. Secondary adjacent point codes cannot be assigned to IPSG-M3UA linksets.

> **Note:**
>
> If you are not adding any secondary adjacent point codes to the linkset, continue the procedure with 5.

3. Display the point code and capability point code of the **EAGLE** by using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT  EAGLE5 36.0.0
   PCA              PCI           PCN
CLLI              PCTYPE
   001-001-001      3-150-4       12345-uk
rlghncxa03w       OTHER

   CPCA
   002-002-002       002-002-003       002-002-004      002-002-005
   002-002-006       002-002-007       002-002-008      002-002-009
   004-002-001       004-003-003       144-212-003

   CPCI
   1-001-1           1-001-2           1-001-3          1-001-4

   CPCN
   02091-uk          02092-uk          02094-uk          02097-uk
   02191-uk          02192-uk          11177-uk
```

4. Display the point codes in the destination point code table by using the `rtrv-dstn` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA          CLLI         BEI ELEI   ALIASI
ALIASN/N24     DMN
   001-002-003   ls04clli     yes --- ----------
--------------   SS7
```

```
  001-002-003   ls04clli    yes --- ----------      --------------   SS7
  002-002-100   ls01clli    no  --- ----------      --------------   SS7
  002-007-008   ls06clli    yes --- ----------      --------------   SS7
  002-009-003   --------    no  --- ----------      --------------   SS7
  002-250-010   --------    no  --- ----------      --------------   SS7
  003-003-003   ls03clli    yes --- ----------      --------------   SS7
  003-020-100   --------    no  --- ----------      --------------   SS7
  004-004-004   ls02clli    yes --- ----------      --------------   SS7
  004-030-200   --------    no  --- ----------      --------------   SS7
  009-002-003   --------    no  --- ----------      --------------   SS7
  179-100-087   --------    yes --- ----------      --------------   SS7
  200-050-176   --------    yes --- ----------      --------------   SS7
  240-007-000   --------    yes --- ----------      --------------   SS7
  240-012--004  rlghncbb001 yes ---    1-111-1         11111         SS7
  240-012-005   rlghncbb002 yes ---    1-112-2         11112         SS7
  240-012-008   --------    yes ---    1-113-5         11114         SS7

 DPCI          CLLI        BEI ELEI   ALIASA          ALIASN/N24    DMN
  2-131-1       rlghncbb023 no  ---    222-210-000     12001         SS7
  2-131-2       --------    no  ---    222-211-001     12002         SS7
  2-131-3       --------    no  ---    222-211-002     12003         SS7
  3-150-4       lsi7clli    yes --- --------------  --------------   SS7

  DPCN          CLLI        BEI ELEI   ALIASA          ALIASI        DMN
  10685         lsn5clli    yes --- --------------  ----------       SS7
  11211         rlghncbb013 no  ---    222-200-200     2-121-1       SS7
  11212         rlghncbb013 no  ---    222-200-201     2-121-2       SS7

Destination table is (23 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

If a secondary adjacent point code is being added to the linkset, and the secondary adjacent point code is not shown in the `rtrv-dstn` command output, go to the Adding a Destination Point Code procedure procedures and add the secondary adjacent point code to the destination point code table.

> **Note:**
>
> If a secondary adjacent point code is being added, and a new point code was added in 4, continue the procedure with 6.

5. Display the routes using the secondary adjacent point code being added to the linkset or being removed from the linkset with the `rtrv-rte` command, specifying the secondary adjacent point code as the value of the `dpc` parameter.

   For this example, enter this command.

   `rtrv-rte:dpci=3-150-5`

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
DPCI       ALIASN/N24       ALIASA      LSN        RC     APC
```

```
3-150-5 --------------   -------------- lsn3      10      3-150-5
                                               RTX:No
CLLI=-----------
```

If the secondary adjacent point code is not the **DPC** of a route, the point code entry is displayed in the `rtrv-rte` output, but the **LSN**, **RC**, and **APC** columns contain dashes, as shown in the following output example.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
   DPCI       ALIASN/N24       ALIASA      LSN        RC    APC
   3-150-5 --------------   -------------- ---------- --
-----------
                                               RTX:No
CLLI=-----------
```

If the point code specified in this step is shown in the `DPCA`/`DPCI`/`DPCN`/ `DPCN24` columns in this step, and the secondary adjacent point code is being added to the linkset, the point code value cannot be used as a secondary adjacent point code unless one of two actions are taken:

- Choose another secondary adjacent point code value and repeat 3, 4, and 5.
- Remove all the entries displayed in this step by performing the Removing a Route procedure.

If the point code specified in this step is shown in the `DPCA`/`DPCI`/`DPCN`/ `DPCN24` columns in this step, and the secondary adjacent point code is removed from the linkset, the routes shown in this step must be removed from the database. Perform the Removing a Route procedure to remove the routes from the database.

> **Note:**
>
> If you are adding only **ITU**-I or 24-bit **ITU**-N secondary adjacent point codes, continue the procedure with 7.

6. Display the secondary point codes in the destination point code table to verify any group codes that are assigned to 14-bit **ITU**-N secondary point codes in the database by using the `rtrv-spc` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
SPC (Secondary Point Codes)

SPCA
     001-010-010
     002-010-010
     003-010-010
     010-100-010

SPC-I
         1-253-5
```

```
         2-254-6
         3-255-7
         4-100-1

SPC-N
        5175-de
        6744-uk
        7673-ge
        7673-fr
SPC-N24
Secondary Point Code table is (12 of 40) 30% full
```

7. Perform one of these steps to configure the linkset with a secondary adjacent point code.
   a. To add the secondary adjacent point code to the linkset, enter the `chg-ls` command with these parameters.

      `:lsn=`<linkset name being changed>

      `:action=add`

      `:sapci=`<**ITU**-I secondary adjacent point code being added>

      or

      `:sapcn`=<14-bit **ITU**-N secondary adjacent point code being added

      or

      `:sapcn24=`<24-bit **ITU**-N secondary adjacent point code being added>

      If the value of the `multgc` parameter is `yes`, and the **APC** of the linkset is a 14-bit **ITU** national point code, the linkset can contain one 14-bit **ITU** national secondary adjacent point code for each group code in the **EAGLE**, and one **ITU** international secondary adjacent point code. If the **APC** of the linkset is an **ITU** international point code, the linkset can contain either one 14-bit **ITU** national secondary adjacent point code for each group code in the **EAGLE**, or one 24-bit **ITU** national secondary adjacent point code, but no **ITU** international secondary adjacent point codes. If the **APC** of the linkset is a 24-bit **ITU** national point code, the linkset contains only one **ITU** international secondary adjacent point code. The output of the `rtrv-dstn` command in 4 and the `rtrv-spc` command in 5 shows the group codes in the database.

      If the value of the `multgc` parameter is `no`, the linkset can contain only one secondary adjacent point code. An **ITU** international linkset can contain either a 14-bit **ITU**-N point code or a 24-bit **ITU**-N point code. An **ITU** national linkset, a linkset containing either a 14-bit **APC** or a 24-bit **APC**, can contain only an **ITU** international secondary adjacent point code.

      Secondary adjacent point codes can be non-spare, spare, private, or private spare point codes. Private and private spare point codes can be specified only for **IPGWI** linksets (linksets containing **IPGWI** signaling links).
   b. To remove the secondary adjacent point code from the linkset, enter the `chg-ls` command with these parameters.

      `:lsn=`<linkset name being changed>

      `:action=delete`

      `:sapci=`<**ITU**-I secondary adjacent point code being removed>

or

`:sapcn`=<14-bit **ITU**-N secondary adjacent point code being added>

or

`:sapcn24=`<24-bit **ITU**-N secondary adjacent point code being added>

c. If only one secondary adjacent point code can be assigned to the linkset, and that secondary adjacent point code is being replaced, perform step **b** to remove the existing secondary adjacent point code, then perform step **a** to add the new secondary adjacent point code.

For this example, enter these commands.

`chg-ls:lsn=lsi3:sapcn=11212-ge:action=add`

`chg-ls:lsn=lsn3:sapci=4-75-7:action=add`

`chg-ls:lsn=lsn5:sapci=3-150-5:action=delete`

When the `chg-ls` command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-17 16:23:21 GMT  EAGLE5 36.0.0
Link set table is ( 13 of 255)  5% full
CHG-LS: MASP A - COMPLTD
```

8. Verify the changes using the `rtrv-ls` command specifying the linkset name specified in 7 with the `lsn` parameter.

For this example, enter these commands.

`rtrv-ls:lsn=lsi3`

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                 L3T SLT             GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsi3          1-111-3        scr3 1   3   yes c   1    off off off
---   ---

          CLLI         TFATCABMLQ MTPRSE ASL8  SLSOCBIT SLSRSB MULTGC
          -----------  1          no     ---   none      7      yes

           ITUTFR RANDSLS
           off    all

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          yes     ---------- 100   100     % 80       % CdPA

          LOC   LINK SLC TYPE
          1317  A    0   IPGWI

          SAPCN
```

```
          11211-uk
          11212-ge
Link set table is ( 13 of 255)  5% full
```

```
rtrv-ls:lsn=lsn3
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn3          11113-ge       scr3 1   3   yes c   1    on  off off ---
off

          CLLI        TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
          ----------- 1          no     ---  none     7      yes

          ITUTFR RANDSLS
          off    off

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCN
          11213-de
Link set table is ( 13 of 255)  5% full
```

```
rtrv-ls:lsn=lsn5
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5          10685-fr       scr1 1   3   yes a   1    off off off  ---
off

          CLLI        TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
          ----------- 1          no     ---  none     7      no

          ITUTFR RANDSLS
          off    off

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA
```

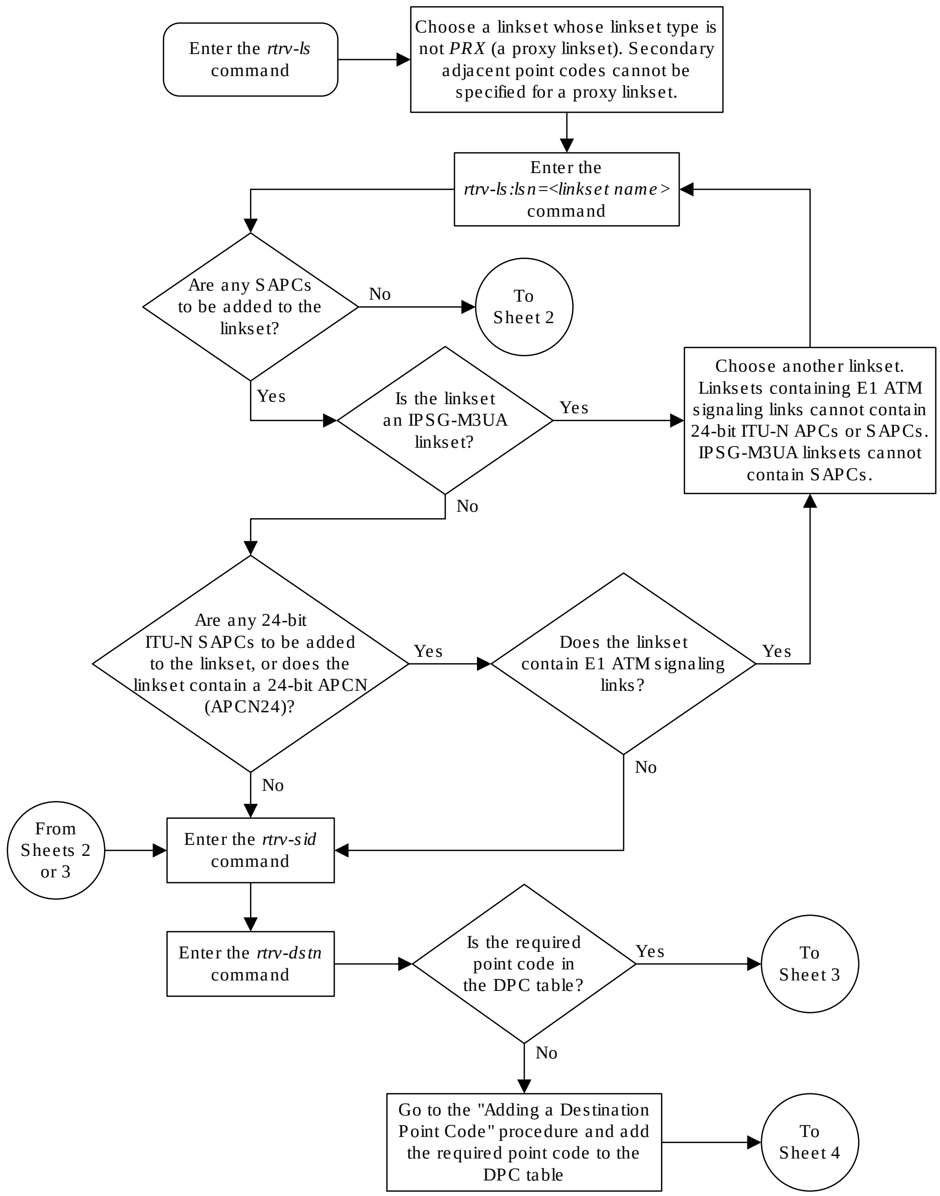
```
          LOC    LINK SLC TYPE      IPLIML2
          1201   A    0   IPLIMI    M2PA

          SAPCI
          4-75-7
Link set table is ( 13 of 255)  5% full
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

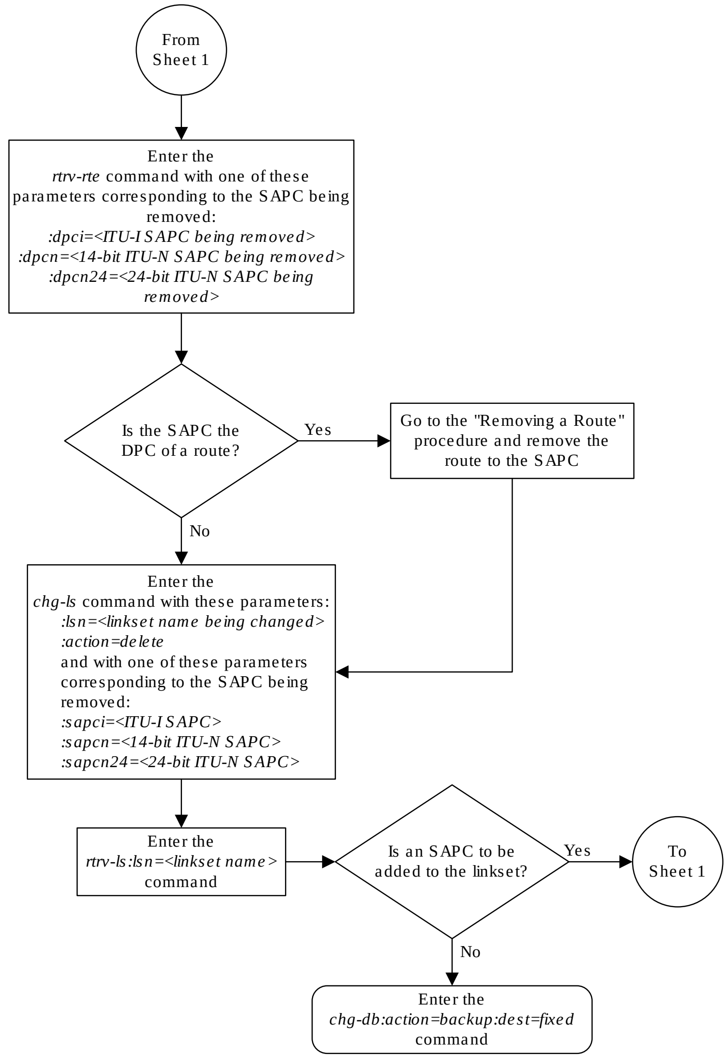
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

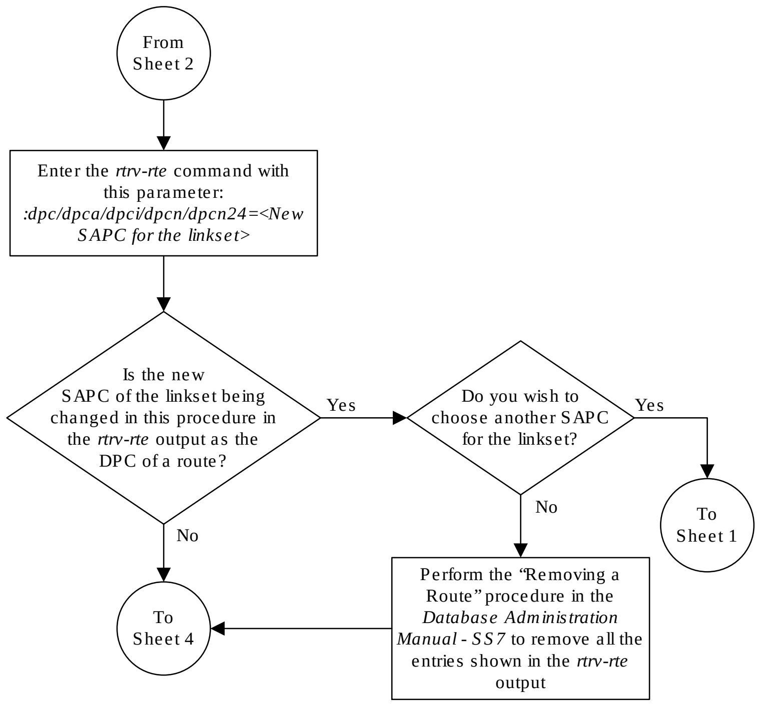
Figure 3-15 Configuring an ITU Linkset with a Secondary Adjacent Point Code (SAPC)



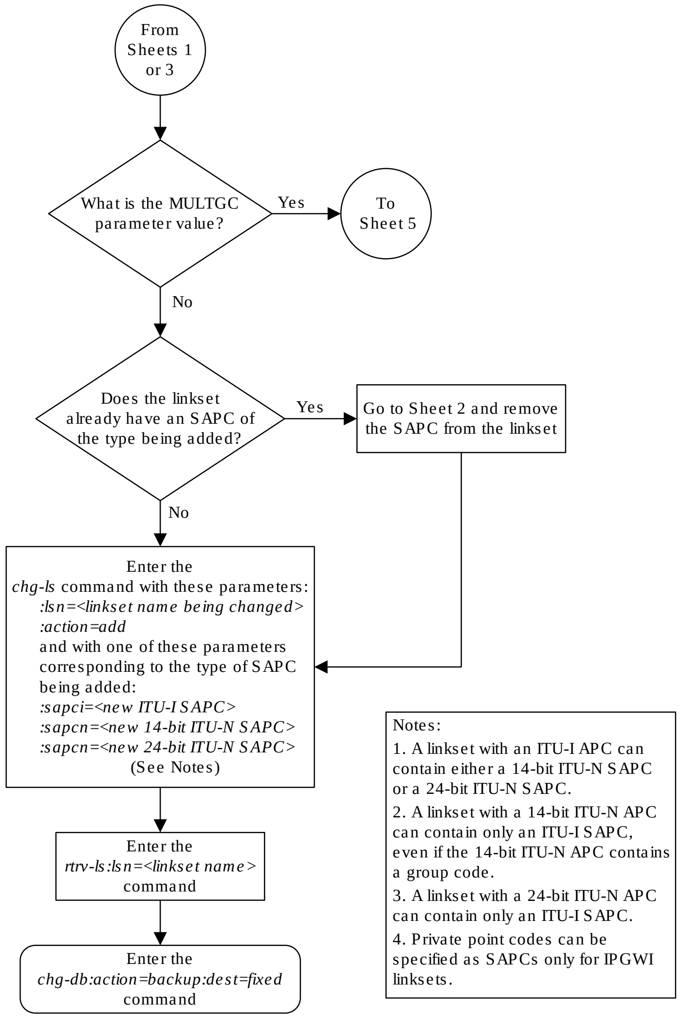
Sheet 1 of 6


From Sheet 1
Enter the *rtrv-rte* command with one of these parameters corresponding to the SAPC being removed:
:dpci=<ITU-I SAPC being removed>
:dpcn=<14-bit ITU-N SAPC being removed>
:dpcn24=<24-bit ITU-N SAPC being removed>
Is the SAPC the DPC of a route?
Yes
Go to the "Removing a Route" procedure and remove the route to the SAPC
No
Enter the *chg-ls* command with these parameters:
:lsn=<linkset name being changed>
:action=delete
and with one of these parameters corresponding to the SAPC being removed:
:sapci=<ITU-I SAPC>
:sapcn=<14-bit ITU-N SAPC>
:sapcn24=<24-bit ITU-N SAPC>
Enter the *rtrv-ls:lsn=<linkset name>* command
Is an SAPC to be added to the linkset?
Yes
To Sheet 1
No
Enter the *chg-db:action=backup:dest=fixed* command

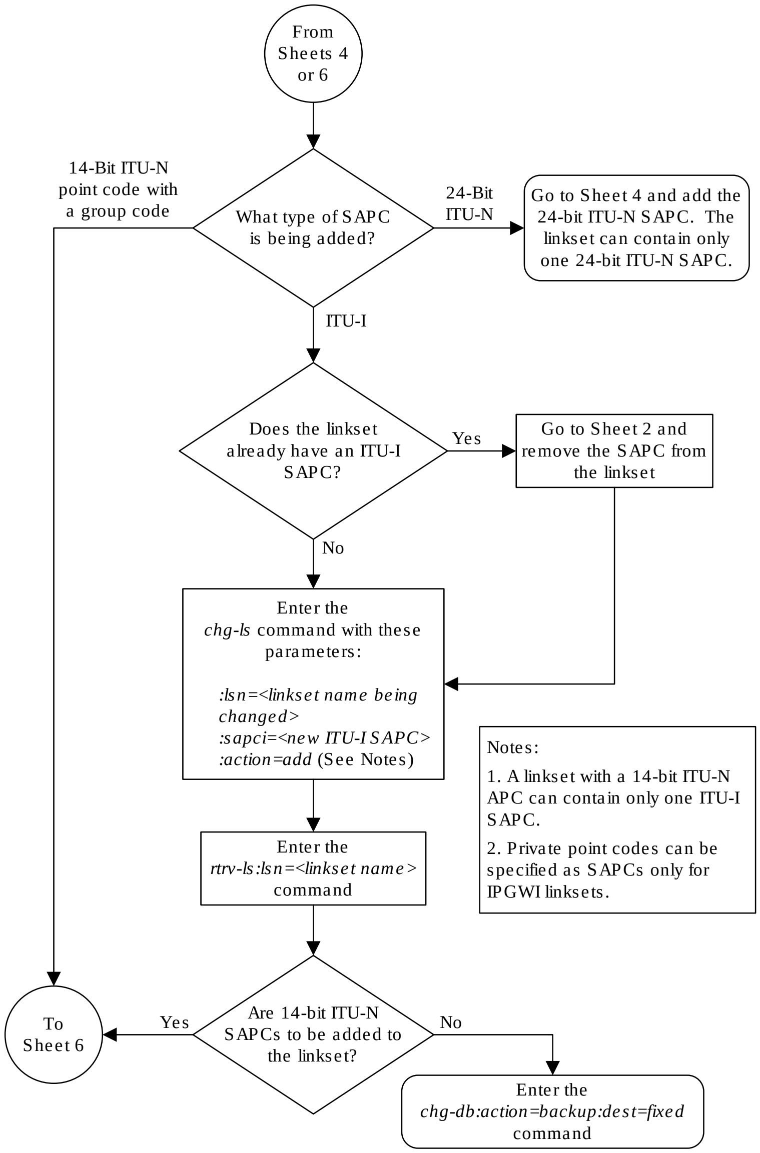
Sheet 2 of 6


From Sheet 2
Enter the *rtrv-rte* command with this parameter: *:dpc/dpca/dpci/dpcn/dpcn24=<New SAPC for the linkset>*
Is the new SAPC of the linkset being changed in this procedure in the *rtrv-rte* output as the DPC of a route?
Yes
Do you wish to choose another SAPC for the linkset?
Yes
To Sheet 1
No
No
Perform the "Removing a Route" procedure in the *Database Administration Manual - SS7* to remove all the entries shown in the *rtrv-rte* output
To Sheet 4

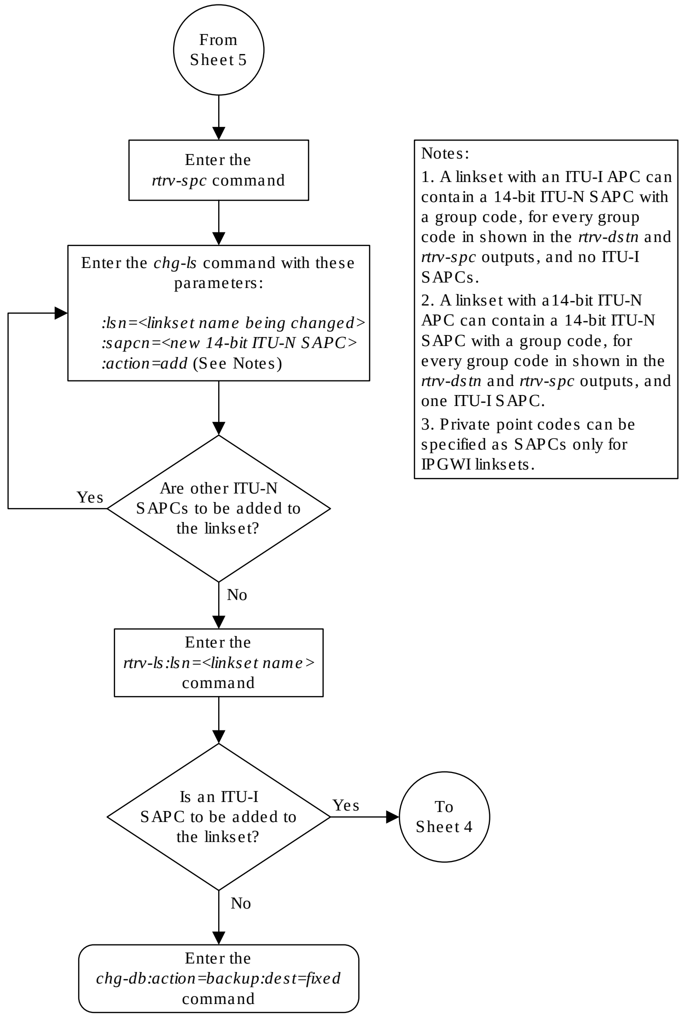
Sheet 3 of 6


From Sheets 1 or 3
What is the MULTGC parameter value?
Yes
To Sheet 5
No
Does the linkset already have an SAPC of the type being added?
Yes
Go to Sheet 2 and remove the SAPC from the linkset
No
Enter the *chg-ls* command with these parameters:
:lsn=<linkset name being changed>
:action=add
and with one of these parameters corresponding to the type of SAPC being added:
:sapci=<new ITU-I SAPC>
:sapcn=<new 14-bit ITU-N SAPC>
:sapcn=<new 24-bit ITU-N SAPC>
(See Notes)
Enter the *rtrv-ls:lsn=<linkset name>* command
Enter the *chg-db:action=backup:dest=fixed* command
Notes:
1. A linkset with an ITU-I APC can contain either a 14-bit ITU-N SAPC or a 24-bit ITU-N SAPC.
2. A linkset with a 14-bit ITU-N APC can contain only an ITU-I SAPC, even if the 14-bit ITU-N APC contains a group code.
3. A linkset with a 24-bit ITU-N APC can contain only an ITU-I SAPC.
4. Private point codes can be specified as SAPCs only for IPGWI linksets.

Sheet 4 of 6


From Sheets 4 or 6
What type of SAPC is being added?
14-Bit ITU-N point code with a group code
24-Bit ITU-N
Go to Sheet 4 and add the 24-bit ITU-N SAPC. The linkset can contain only one 24-bit ITU-N SAPC.
ITU-I
Does the linkset already have an ITU-I SAPC?
Yes
Go to Sheet 2 and remove the SAPC from the linkset
No
Enter the chg-ls command with these parameters:
:lsn=<linkset name being changed>
:sapci=<new ITU-I SAPC>
:action=add (See Notes)
Notes:
1. A linkset with a 14-bit ITU-N APC can contain only one ITU-I SAPC.
2. Private point codes can be specified as SAPCs only for IPGWI linksets.
Enter the rtrv-ls:lsn=<linkset name> command
Are 14-bit ITU-N SAPCs to be added to the linkset?
Yes
To Sheet 6
No
Enter the chg-db:action=backup:dest=fixed command

Sheet 5 of 6



Sheet 6 of 6

3.18 Adding an SS7 Signaling Link

This procedure is used to add an ANSI **SS7** low-speed signaling link to an MPL card using the `ent-slk` command with these parameters shown in Table 3-14.

Table 3-14 Signaling Link Parameters

loc	link	lsn
slc	l2tset	bps

Table 3-14 (Cont.) Signaling Link Parameters

ecm	pcrn1	pcrn2

The `ent-slk` command contains other optional parameters that are not used this procedure. These parameters are discussed in more detail in the *Commands Manual* or in these sections. These sections are also used to configure ITU signaling links.

- These procedures in this manual.
  - The Adding an E1 Signaling Link procedure
  - The Adding a T1 Signaling Link procedure
  - The Adding an ATM High-Speed Signaling Link procedure.
- These procedures in *Database Administration - IP7 User's Guide*
  - Adding an IPGWx Signaling Link
  - Adding an IPLIMx Signaling Link
  - Adding an IPSG M3UA Signaling Link
  - Adding an IPSG M2PA Signaling Link

`:loc` – The card location of the **LIM** that the **SS7** signaling link will be assigned to.

`:link` – The signaling link on the card specified in the `loc` parameter.

`:lsn` – The name of the linkset that will contain the signaling link.

`:slc` – The signaling link code. The **SLC** must be unique within the linkset. It must be the same at both the **EAGLE** location and the distant node.

`:l2tset` – The level 2 timer set table. A signaling link may be assigned to any of the thirty tables. The type of linkset the signaling link is assigned to and the **LIM**'s application determines the value of the `l2tset` parameter. The level 2 timer set tables are defined in Changing Level 2 Timers .

`:bps` – The transmission rate for the link in bits per second.

`:ecm` – Error correction method

`:pcrn1` – The threshold of the number of **MSUs** available for retransmission. If the error correction method being used is **PCR** `(:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISUs** are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

`:pcrn2` – The threshold of the number of **MSU** octets available for retransmission. If the error correction method being used is **PCR** (`:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISUs** are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

These items must be configured in the database before an **SS7** signaling link can be added:

- Shelf – see "Adding a Shelf in *Database Administration - System Management User's Guide*
- Card – see "Adding an SS7 LIM" in *Database Administration - System Management User's Guide*

- Destination **Point Code** – see Adding a Destination Point Code
- Linkset – Adding an SS7 Linkset .

Verify that the link has been physically installed (all cable connections have been made).

To configure the **EAGLE** to perform circular routing detection test on the signaling links, perform the Configuring Circular Route Detection procedure.

> **Note:**
>
> Circular route detection is not supported in **ITU** networks.

To provision a **EAGLE** with more than 1200 signaling links, the **EAGLE** must have certain levels of hardware installed. See the Requirements for EAGLEs Containing more than 1200 Signaling Links section for more information on these hardware requirements.

The **EAGLE** can contain a mixture of low-speed, **E1**, **T1**, **ATM** high-speed, and **IP** signaling links. The Determining the Number of High-Speed and Low-Speed Signaling Links section describes how to determine the quantities of the different types of signaling links the **EAGLE** can have.

SS7Signaling Link Parameter Combinations

Table 3-15 shows the parameters and values that can be used to provision an ANSI **SS7** signaling link.

Table 3-15 SS7 Signaling Link Parameter Combinations

MPL Signaling Link (See Note 1)
Mandatory Parameters
:loc = location of the **MPL** with the **SS7ANSI** application and the **LIMDS0** card type.
:link = A, A1, A2, A3, B, B1, B2, or B3 (See Note 4)
:lsn = linkset name (See Note 3)
:slc = 0 - 15
Optional Parameters
:bps = 56000 default value = 56000
:l2tset = Table 3-16
:ecm = basic or pcr default value = basic
:pcrn1 = 1 - 127 (See Note 2) default value = 76
:pcrn2 = 300 - 35500 (See Note 2) default value = 3800

Table 3-15 (Cont.) SS7 Signaling Link Parameter Combinations

MPL Signaling Link (See Note 1)
Notes: 1. This procedure is not used to configure **ATM**, **IP**, **E1**, or **T1** signaling links. To configure these types of links, perform one of these procedures: • **E1** signaling links – Adding an E1 Signaling Link. • **T1** signaling links – Adding a T1 Signaling Link. • **ATM** signaling links – Adding an ATM High-Speed Signaling Link. • **IP** signaling links – “Adding an IPLIMx Signaling Link,” "Adding an IPGWX Signaling Link, " "Adding an IPSG M3UA Signaling Link," or " Adding an IPSG M2PA Signaling Link" procedures in *Database Administration - IP7 User's Guide*. 2. These parameters can be specified only with the `ecm=pcr` parameter. 3. The linkset adjacent point code type must be **ANSI**. The domain of the linkset adjacent point code must be **SS7**. 4. The `port` parameter can be used in place of the `link` parameter to specify the signaling link on the card.

Canceling the `REPT-STAT-SLK` and `RTRV-SLK` Commands

Because the `rept-stat-slk` and `rtrv-slk` commands used in this procedure can output information for a long period of time, the `rept-stat-slk` and `rtrv-slk` commands can be canceled and the output to the terminal stopped. There are three ways that the `rept-stat-slk` and `rtrv-slk` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered, from another terminal other that the terminal where the `rept-stat-slk` or `rtrv-slk` commands was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal’s permissions can be verified with the `rtrv-secu-trm` command. The user’s permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the maximum number of signaling links the EAGLE can have and the number of signaling links that are currently provisioned by entering the `rtrv-tbl-capacity` command.

   This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0

SLK       table is (         7 of       1200)    1% full
```

> **Note:**
>
> The `rtrv-tbl-capacity` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-tbl-capacity` command, refer to the `rtrv-tbl-capacity` command description in *Commands User's Guide*.

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have (in this example, the maximum number of signaling links is 1200), and the maximum number of signaling links is 2800, this procedure cannot be performed. The EAGLE cannot contain more than 2800 signaling links.

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have, and the maximum number of signaling links is less than 2800, perform the Enabling the Large System # Links Controlled Feature procedure to enable the desired quantity of signaling links. After the new quantity of signaling links has been enabled, continue the procedure with 2.

If the addition of the new signaling link will not exceed the maximum number of signaling links the EAGLE can have, continue the procedure with 2.

2. Display the current signaling link configuration using the `rtrv-slk` command. This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0

                                    L2T               PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1201 B     lsa1           0  LIMDS0    1    56000  BASIC ---   -----
1203 B     lsa2           0  LIMDS0    1    56000  BASIC ---   -----
1205 A     lsa3           0  LIMDS0    3    56000  BASIC ---   -----
1207 A     lsn1207a       0  LIMDS0    1    56000  BASIC ---   -----
1207 B     lsn1207b       0  LIMDS0    1    56000  BASIC ---   -----
1214 A     lsn1214a       0  LIMDS0    2    56000  BASIC ---   -----
1214 B     lsa3           1  LIMDS0    3    56000  BASIC ---   -----

SLK table is (7 of 1200) 1% full.
```

3. Display the cards in the database using the `rtrv-card` command. This is an example of the possible output.

```
rlghncxa03w 09-10-28 09:12:36 GMT EAGLE5 41.1.0
CARD   TYPE      APPL      LSET NAME     LINK SLC LSET NAME
LINK SLC
1101   DSM       VSCCP
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
```

```
1201   LIMDS0    SS7ANSI   lsa1         B    0
1202   LIMDS0    SS7ANSI
1203   LIMDS0    SS7ANSI   lsa2         B    0
1205   LIMDS0    SS7ANSI   lsa3         A    0
1207   LIMDS0    SS7ANSI   lsn1207a     A    0    lsn1207b      B    0
1214   LIMDS0    SS7ANSI   lsn1214a     A    0    lsa3          B    1
1302   LIMATM    ATMANSI
1305   LIMATM    ATMANSI
1311   LIMDS0    SS7ANSI
1318   LIMATM    ATMANSI
```

If the required card is not in the database, go to the "Adding an SS7 LIM" procedure in *Database Administration - System Management User's Guide* and add the card to the database.

4. Display the current linkset configuration using the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 09-10-10 11:43:04 GMT EAGLE5 41.1.0
                                 L3T SLT             GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn01          000-005-000   none 1   1   no  A   0    off off off no
off
lsn02          000-007-000   none 1   1   no  A   0    off off off no
off
lsa1           001-207-000   none 1   1   no  B   1    off off off no
off
lsa2           001-002-001   none 1   1   no  A   1    off off off no
off
lsa3           001-001-003   none 1   1   no  A   2    off off off no
off
lsn1207a       001-003-002   none 1   1   no  A   1    off off off no
off
lsn1207b       001-004-002   none 1   1   no  A   1    off off off no
off
lsn1214a       001-005-002   none 1   1   no  A   1    off off off no
off

Link set table is (8 of 1024) 1% full.
```

If the desired linkset is not in the database, perform Adding an SS7 Linkset to add the linkset to the database. After the linkset has been added to the database, continue the procedure with 6.

If the desired linkset is in the database, continue the procedure with 5.

5. Display the attributes of the linkset that will contain the new signaling link by entering the rtrv-ls command with the name of the linkset shown in 4. For this example, enter these commands.

   `rtrv-ls:lsn=ls1305`

This is an example of the possible output.

```
rlghncxa03w 09-10-10 11:43:04 GMT EAGLE5 41.1.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls01          000-005-000   none 1   1   no  A   0    off off off
no    off

              SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE            CGGTMOD
           no    no       CdPA                no

Link set table is (8 of 1024) 1% full.
```

```
rtrv-ls:lsn=ls1307
```

This is an example of the possible output.

```
rlghncxa03w 09-10-10 11:43:04 GMT EAGLE5 41.1.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls02          000-007-000   none 1   1   no  A   0    off off off
no    off

              SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE            CGGTMOD
           no    no       CdPA                no

Link set table is (8 of 1024) 1% full.
```

The signaling link cannot be assigned to a linkset whose `IPSG` or `IPGWAPC` values are `yes`. If either the `IPSG` or `IPGWAPC` value for the linkset is `yes`, repeat the procedure from 4 and choose another linkset.

If the `IPSG` and `IPGWAPC` values for the linkset are `no`, continue the procedure with 6.

6. Add the signaling link to the database using the `ent-slk` command. Use Table 3-15 as a guide for the parameters that can be specified with the `ent-slk` command. For this example, enter these commands.

   `ent-slk:loc=1201:link=a:lsn=ls01:slc=0:l2tset=1`

   `ent-slk:loc=1202:link=b:lsn=ls02:slc=0:l2tset=2`

   `ent-slk:loc=1311:link=a:lsn=ls01:slc=2:l2tset=1`

   `ent-slk:loc=1311:link=a1:lsn=ls05:slc=2:l2tset=5`

   `ent-slk:loc=1311:link=b:lsn=ls03:slc=2:l2tset=3`

   `ent-slk:loc=1311:link=b1:lsn=ls07:slc=1:l2tset=7`

   When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:29:03 GMT  EAGLE5 36.0.0
ENT-SLK: MASP A - COMPLTD
```

> **Note:**
>
> If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the `rtrv-measopts` output is `on`, the scheduled UI measurement reports will be disabled.

7. Verify the changes using the `rtrv-slk` command and specifying the card location specified in 6. For this example, enter these commands.

   `rtrv-slk:loc=1201`

   This is an example of the possible output.

```
rlghncxa03w 09-07-10 11:43:04 GMT EAGLE5 41.1.0

                                  L2T                PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1201  A     ls01          0  LIMDS0   1    56000  BASIC ---   -----
1201  B     lsa1          0  LIMDS0   1    56000  BASIC ---   -----
```

   `rtrv-slk:loc=1202`

   This is an example of the possible output.

```
rlghncxa03w 09-07-10 11:43:04 GMT EAGLE5 41.1.0

                                  L2T                PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1    N2
1202  B     ls02          0  LIMDS0   2    56000  BASIC ---   -----
```

   `rtrv-slk:loc=1311`

This is an example of the possible output.

```
rlghncxa03w 09-07-10 11:43:04 GMT EAGLE5 41.1.0

                                 L2T              PCR  PCR
LOC   LINK LSN          SLC TYPE     SET  BPS     ECM   N1   N2
1311 A     ls01          2  LIMDS0   1    56000   BASIC ---  -----
1311 A1    ls05          2  LIMDS0   5    56000   BASIC ---  -----
1311 B     ls03          2  LIMDS0   3    56000   BASIC ---  -----
1311 B1    ls07          1  LIMDS0   7    56000   BASIC ---  -----
```

If any of the cards shown in this step contain the first signaling link on a card, continue the procedure with 8.

If signaling links were assigned to all the cards shown in this step when 6 was performed, continue the procedure with 9.

8. Bring the cards into service with the `rst-card` command, specifying the location of the card specified in 7. For this example, enter these commands.

   `rst-card:loc=1202`

   `rst-card:loc=1311`

   When each of these commands have successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-23 13:05:05 GMT EAGLE5 36.0.0
   Card has been allowed.
   ```

9. Activate all signaling links on the cards using the `act-slk` command, specifying the card location and signaling link specified in 6 . For this example, enter these commands.

   `act-slk:loc=1201:link=a`

   `act-slk:loc=1202:link=b`

   `act-slk:loc=1311:link=a`

   `act-slk:loc=1311:link=a1`

   `act-slk:loc=1311:link=b`

   `act-slk:loc=1311:link=b1`

   When each of these commands have successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-07 08:31:24 GMT  EAGLE5 36.0.0
   Activate Link message sent to card
   ```

10. Check the status of the signaling links added in 6 using the `rept-stat-slk` command with the card location and signaling link. The state of each signaling link should be in service normal (**IS-NR**) after the link has completed alignment (shown in the `PST` field). For this example, enter these commands.

```
rept-stat-slk:loc=1201:link=a
```

This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK       LSN       CLLI         PST           SST        AST
1201,A    ls01      ls01clli     IS-NR         Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

```
rept-stat-slk:loc=1202:link=b
```

This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK       LSN       CLLI         PST           SST        AST
1202,B    ls02      ls02clli     IS-NR         Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

```
rept-stat-slk:loc=1311:link=a
```

This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK       LSN       CLLI         PST           SST        AST
1311,A    ls01      ls01clli     IS-NR         Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

```
rept-stat-slk:loc=1311:link=a1
```

This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK       LSN       CLLI         PST           SST        AST
1311,A1   ls05      ls05clli     IS-NR         Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

```
rept-stat-slk:loc=1311:link=b
```

This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK       LSN       CLLI         PST           SST        AST
1311,B    ls03      ls03clli     IS-NR         Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

```
rept-stat-slk:loc=1311:link=b1
```

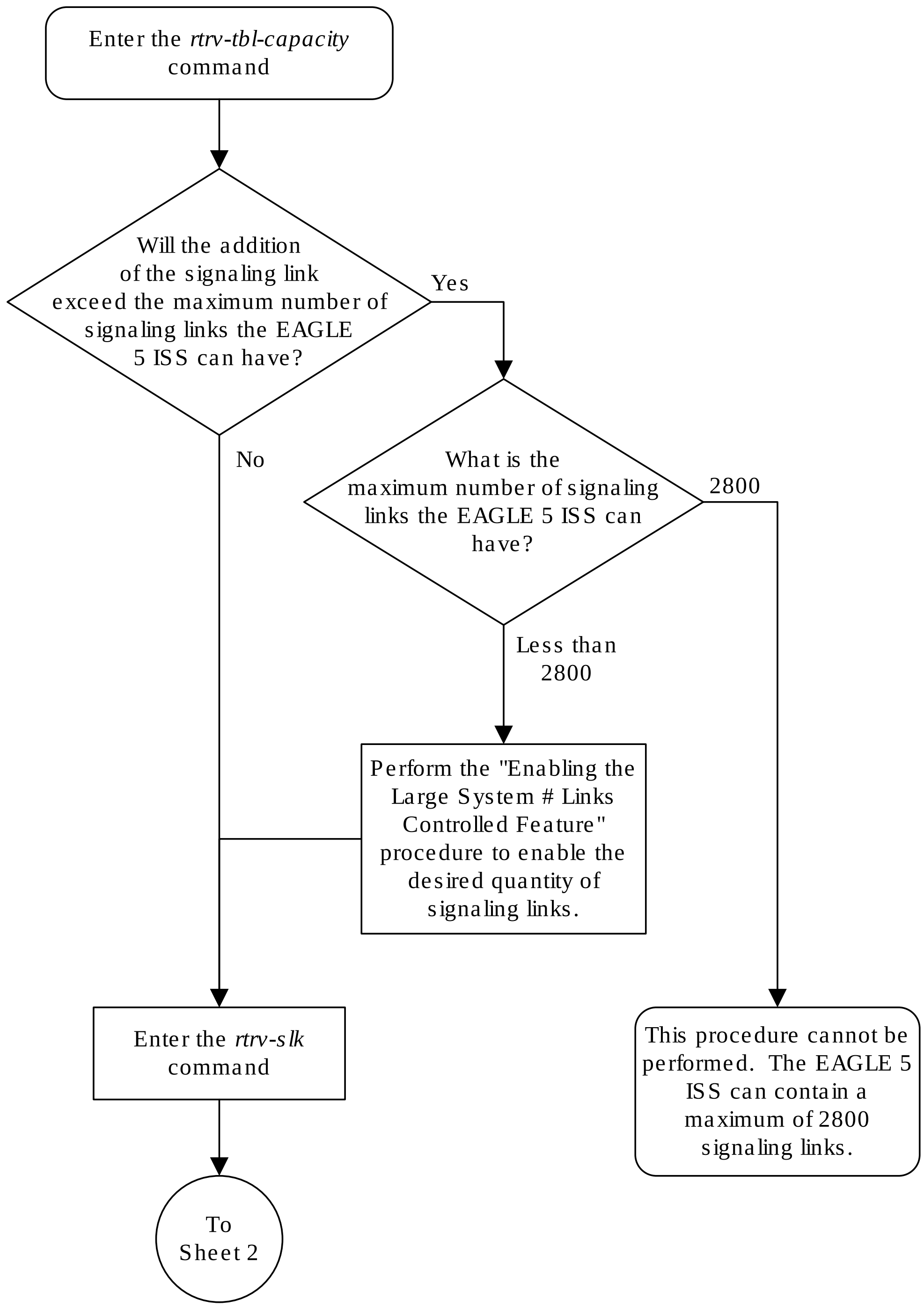
This is an example of the possible output.

```
rlghncxa03w 08-12-23 13:06:25 GMT EAGLE5 40.0.0
SLK      LSN       CLLI        PST          SST       AST
1311,B1  ls07      ls07clli    IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
```

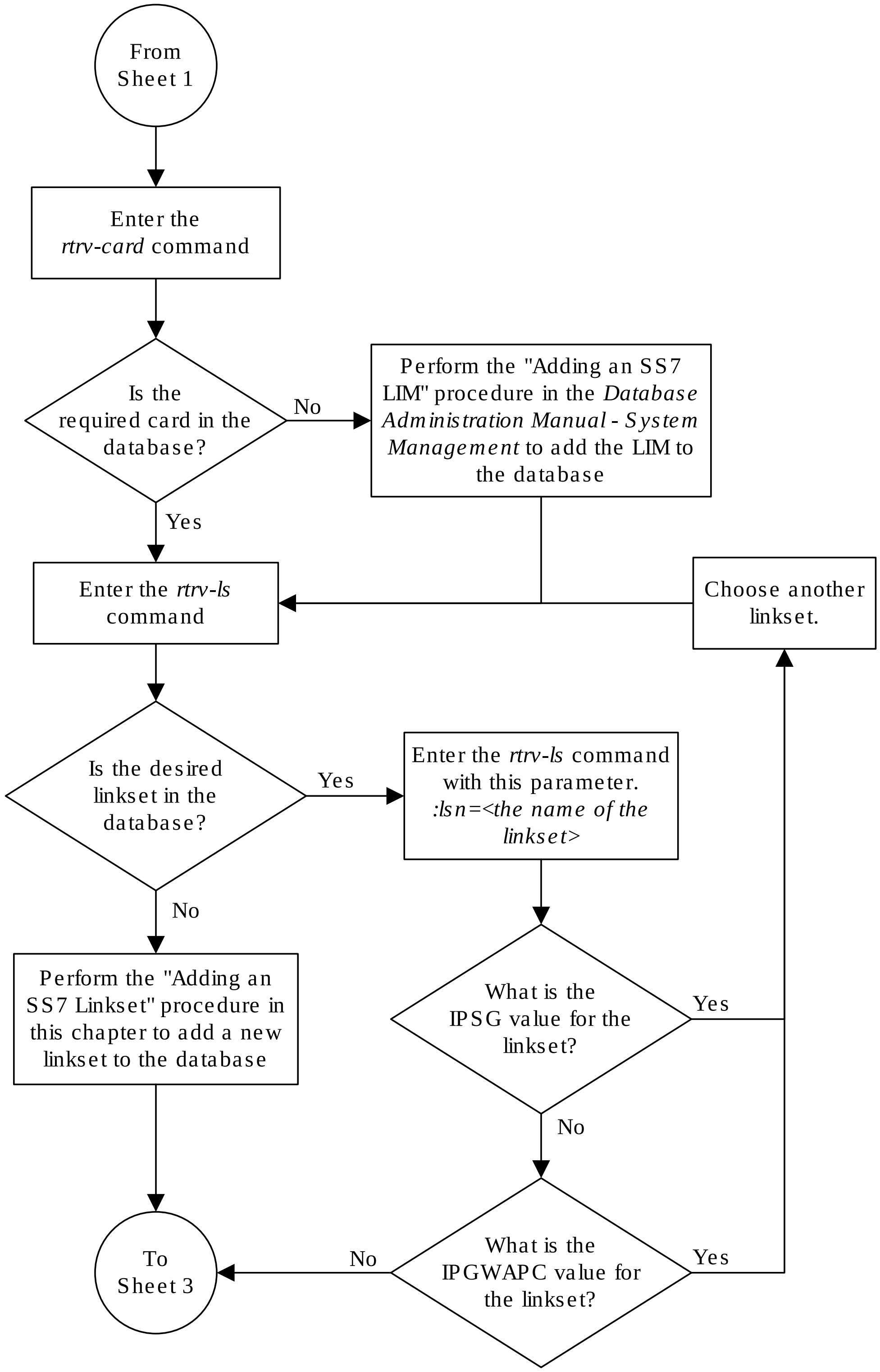
11. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

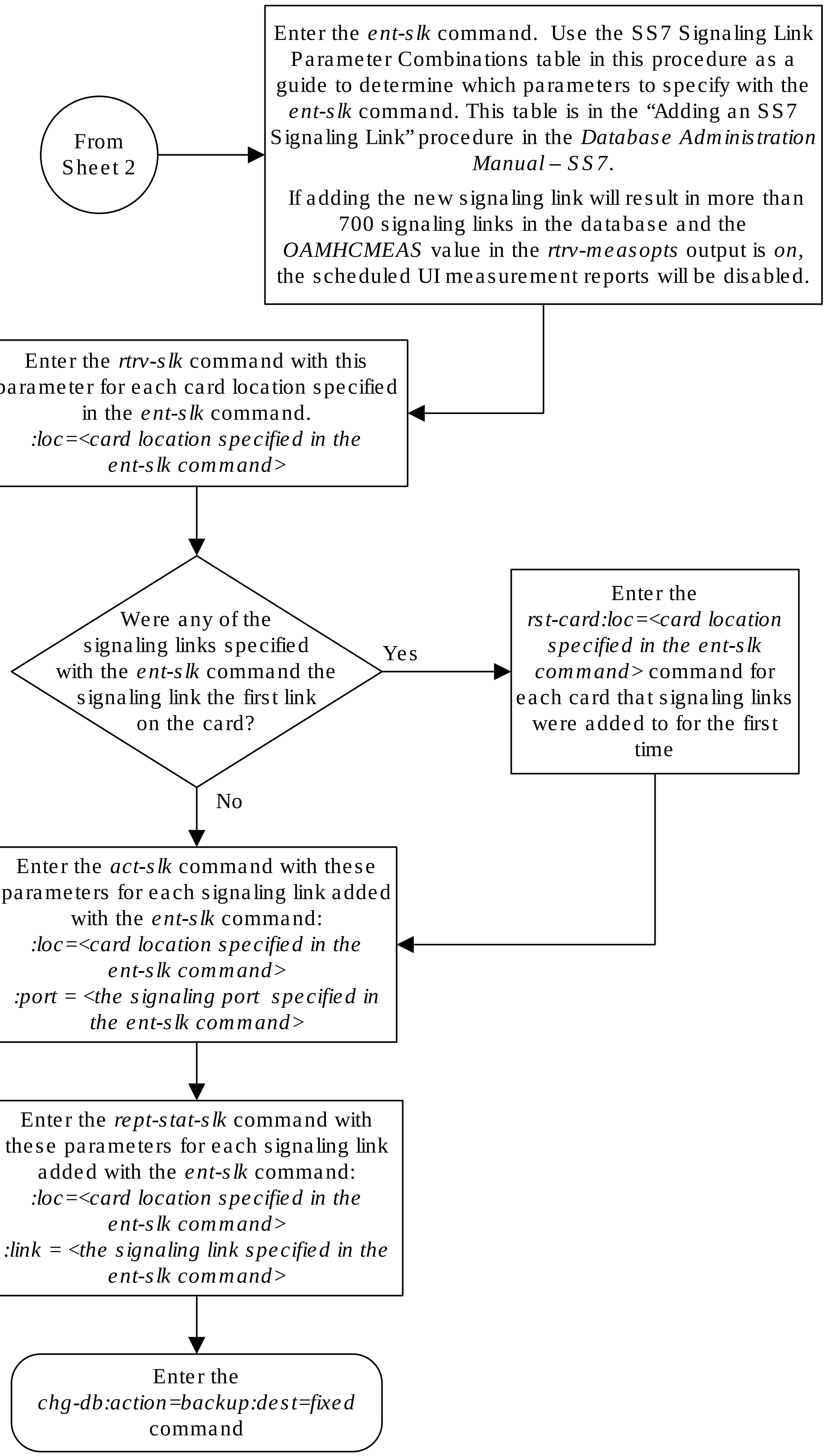
Figure 3-16 Adding an SS7 Signaling Link



Sheet 1 of 3


From Sheet 1
Enter the *rtrv-card* command
Is the required card in the database?
No
Perform the "Adding an SS7 LIM" procedure in the *Database Administration Manual - System Management* to add the LIM to the database
Yes
Enter the *rtrv-ls* command
Choose another linkset.
Is the desired linkset in the database?
Yes
Enter the *rtrv-ls* command with this parameter. *:lsn=<the name of the linkset>*
No
Perform the "Adding an SS7 Linkset" procedure in this chapter to add a new linkset to the database
What is the IPSG value for the linkset?
Yes
No
To Sheet 3
No
What is the IPGWAPC value for the linkset?
Yes

Sheet 2 of 3


From Sheet 2
Enter the ent-slk command. Use the SS7 Signaling Link Parameter Combinations table in this procedure as a guide to determine which parameters to specify with the ent-slk command. This table is in the "Adding an SS7 Signaling Link" procedure in the Database Administration Manual – SS7.
If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the rtrv-measopts output is on, the scheduled UI measurement reports will be disabled.
Enter the rtrv-slk command with this parameter for each card location specified in the ent-slk command.
:loc=<card location specified in the ent-slk command>
Were any of the signaling links specified with the ent-slk command the signaling link the first link on the card?
Yes
Enter the rst-card:loc=<card location specified in the ent-slk command> command for each card that signaling links were added to for the first time
No
Enter the act-slk command with these parameters for each signaling link added with the ent-slk command:
:loc=<card location specified in the ent-slk command>
:port = <the signaling port specified in the ent-slk command>
Enter the rept-stat-slk command with these parameters for each signaling link added with the ent-slk command:
:loc=<card location specified in the ent-slk command>
:link = <the signaling link specified in the ent-slk command>
Enter the chg-db:action=backup:dest=fixed command

Sheet 3 of 3

3.19 Removing an SS7 Signaling Link

This procedure is used to remove an **SS7** low-speed, **ATM**, **E1**, **E1** high-speed, or **T1** signaling link from the database using the `dlt-slk` command. To remove other types of signaling links from the database, go to one of these procedures.

The link to be removed must exist in the database. This can be verified in 1 .

The `dlt-slk` command uses these parameters.

`:loc` – The card location of the **LIM** that the **SS7** signaling link is assigned to.

`:link` – The signaling link on the card specified in the `loc` parameter.

`:force` – This parameter must be used to remove the last link in a linkset without having to remove all of the routes that referenced the linkset.

The `tfatcabmlq` parameter (**TFA**/**TCA** Broadcast Minimum **Link** Quantity), assigned to linksets, shows the minimum number of links in the given linkset (or in the combined link set in which it resides) that must be available for traffic. When the number of signaling links in the specified linkset is equal to or greater than the value of the `tfatcabmlq` parameter, the status of the routes that use the specified linkset is set to allowed and can carry traffic. Otherwise, these routes are restricted. The value of the `tfatcabmlq` parameter cannot exceed the total number of signaling links contained in the linkset.

If the linkset type of the linkset that contains the signaling link that is being removed is either A, B, D, E, or PRX, the signaling link can be removed regardless of the `tfatcabmlq` parameter value of the linkset and regardless of the `LSRESTRICT` option value. When a signaling link in one of these types of linksets is removed, the `tfatcabmlq` parameter value of the linkset is decreased automatically.

If the linkset type of the linkset that contains the signaling link that is being removed is C, the signaling link can be removed only:

- If the `LSRESTRICT` option is off. The `LSRESTRICT` option value is shown in the `rtrv-ss7opts` output.
- If the `LSRESTRICT` option is on and the number of signaling links assigned to the linkset will be equal to or greater than the value of the `tfatcabmlq` parameter value of the linkset after the signaling link is removed.
  The `tfatcabmlq` parameter value of the linkset is shown in the `TFATCABMLQ` column of the `rtrv-ls:lsn=<linkset name>` output. The `tfatcabmlq` parameter value can be a fixed value (1 to 16) or 0. If the `tfatcabmlq` parameter value of the linkset is a fixed value, the number of signaling links that are in the linkset after the signaling link is removed must be equal to or greater than the `tfatcabmlq` parameter value of the linkset.

  If the `tfatcabmlq` parameter value is 0, the signaling link can be removed. When the `tfatcabmlq` parameter value is 0, the value displayed in the `TFATCABMLQ` column of the `rtrv-ls` output is 1/2 of the number of signaling links contained in the linkset. If the number of signaling links in the linkset is an odd number, the `tfatcabmlq` parameter value is rounded up to the next whole number. As the signaling links are removed, the `tfatcabmlq` parameter value of the linkset is decreased automatically.

The signaling link cannot be removed from the database if link fault sectionalization (**LFS**) tests are being performed on it. This can be verified using the `rept-stat-lfs` command.

Canceling the RTRV-SLK Command

Because the `rtrv-slk` command used in this procedure can output information for a long period of time, the `rtrv-slk` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-slk` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-slk` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-slk` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-slk` command was entered, from another terminal other that the terminal where the `rtrv-slk` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands Manual*.

1. Display the current link configuration using the `rtrv-slk` command. This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0

                                     L2T                PCR  PCR
LOC   LINK LSN         SLC TYPE      SET  BPS    ECM    N1   N2
1201 A     ls01          0 LIMDS0    1    56000  BASIC ---  -----
1201 B     lsa1          0 LIMDS0    1    56000  BASIC ---  -----
1202 B     ls02          0 LIMDS0    2    56000  BASIC ---  -----
1203 A     ls03          0 LIMDS0    3    56000  BASIC ---  -----
1203 B     lsa2          0 LIMDS0    1    56000  BASIC ---  -----
1204 B     ls01          1 LIMDS0    1    56000  BASIC ---  -----
1205 A     lsa3          0 LIMDS0    4    56000  BASIC ---  -----
1206 A     ls02          1 LIMDS0    2    56000  BASIC ---  -----
1207 A     lsn1207a      0 LIMDS0    1    56000  BASIC ---  -----
1207 B     lsn1207b      0 LIMDS0    1    56000  BASIC ---  -----
1208 B     ls03          1 LIMDS0    3    56000  BASIC ---  -----
1212 A     ls04          0 LIMDS0    4    56000  BASIC ---  -----
1213 B     ls05          0 LIMDS0    5    56000  BASIC ---  -----
1214 A     lsn1214a      0 LIMDS0    2    56000  BASIC ---  -----
1214 B     lsa3          1 LIMDS0    4    56000  BASIC ---  -----
1215 A     ls05          1 LIMDS0    5    56000  BASIC ---  -----
1301 B     ls06          0 LIMDS0    6    56000  BASIC ---  -----
1304 B     ls06          1 LIMDS0    6    56000  BASIC ---  -----
1308 A     ls06          2 LIMDS0    6    56000  BASIC ---  -----
1311 A     ls01          2 LIMDS0    1    56000  BASIC ---  -----
1311 A1    ls05          2 LIMDS0    5    56000  BASIC ---  -----
```

```
1311 B    ls03         2  LIMDS0   3    56000  BASIC ---  -----
1311 B1   ls07         1  LIMDS0   7    56000  BASIC ---  -----
1313 A    ls07         0  LIMDS0   7    56000  BASIC ---  -----
1315 A    lsn5         0  LIMDS0   11   56000  BASIC ---  -----
1317 A    lsi7         0  LIMDS0   11   56000  BASIC ---  -----

                                   LP            ATM
LOC  LINK LSN         SLC TYPE     SET  BPS      TSEL      VCI
VPI   LL
1302 A    atmansi0     0  LIMATM   3    1544000  EXTERNAL  35
15    0
1305 A    atmansi1     0  LIMATM   4    1544000  INTERNAL  100
20    2
1318 A    atmansi0     1  LIMATM   9    1544000  LINE      150
25    4

                                   LP
ATM                    E1ATM
LOC  LINK LSN         SLC TYPE     SET BPS     TSEL      VCI   VPI
CRC4 SI  SN
2101 A    atmitu1      0  LIME1ATM 5   2.048M LINE      150   2
ON   1  20
2105 A    atmitu1      1  LIME1ATM 5   2.048M LINE      35    15
ON   2  15

SLK table is (31 of 1200) 3% full
```

2. Display the linkset that contains the signaling link that is being removed by entering the `rtrv-ls` command with the name of the linkset shown in the `LSN` column of the `rtrv-slk` output.

   For this example, enter this command.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 10-07-17 11:43:04 GMT EAGLE5 42.0.0

                                L3T SLT                GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls04          002-009-003    scr2 1   1   no  a   1    on  off on
no    off

              SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          no     no

           RANDSLS
           off

           ISLSRSB RSLS8
           1       no

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
```

```
                    no     no        CdPA              no

                                            L2T               PCR   PCR
                    LOC   LINK  SLC  TYPE      SET   BPS    ECM    N1    N2
                    1212  A     0    LIMDS0    1     56000  BASIC  ----  ------

Link set table is ( 20 of 1024)  2% full
```

If the linkset type of the linkset is A, B, D, E, or PRX, continue the procedure with 5.

If the linkset type of the linkset is C, continue the procedure with 3.

3. Display the `LSRESTRICT` option value by entering the `rtrv-ss7opts` command.

   This is an example of the possible output.

```
rlghncxa03w 10-07-30 15:09:00 GMT  42.0.0

SS7 OPTIONS
-----------------------
LSRESTRICT     on
```

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, refer to the `rtrv-feat` command description in the *Commands Manual*.

The signaling link cannot be removed, if the `LSRESTRICT` option is `on` and the number of signaling links assigned to the linkset will be less than the value of the `tfatcabmlq` parameter value of the linkset if the signaling link is removed.

If the `LSRESTRICT` option is `on` and the number of signaling links assigned to the linkset will be equal to or greater than the value of the `tfatcabmlq` parameter value of the linkset if the signaling link is removed, continue the procedure with 5.

If the `LSRESTRICT` option is `on` and the number of signaling links assigned to the linkset will be less than the value of the `tfatcabmlq` parameter value of the linkset if the signaling link is removed, the signaling link cannot be removed unless the `tfatcabmlq` parameter value of the linkset is changed to 0. Continue the procedure with 4..

If the `LSRESTRICT` value is `off`, continue the procedure with 5.

4. Change the `tfatcabmlq` parameter value of the linkset to 0 by entering the `chg-ls` command with the name of the linkset that contains the signaling link that is being removed and the `tfatcabmlq` parameters. For this example, enter this command.

   `chg-ls:lsn=ls17:tfatcabmlq=0`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 10-07-07 08:41:12 GMT  EAGLE5 42.0.0
```

```
Link set table is (20 of 1024) 2% full.

CHG-LS: MASP A - COMPLTD
```

5. Enter the `rept-stat-lfs` command to verify whether or not a link fault sectionalization test is being performed on the signaling link to be removed from the database. This is an example of the possible output.

```
rlghncxa03w 06-10-07 08:41:12 GMT  EAGLE5 36.0.0
SLK       LBP  PATTERN    MAX-ERRORS  BIT_ERRORS  MAX-TIME TEST-TIME
1201,A      5  B0247              56          30  01:00:00 00:00:50
1202,A      3  B511               56          27  01:00:00 00:01:05
1203,A      1  OCTET              56          12  01:00:00 00:02:07
1204,A      6  ALTERNATE          56          28  01:00:00 00:04:08
1205,A      2  B0247              56          36  01:00:00 00:03:05
1206,A      1  B0247              56          15  01:00:00 00:06:06
1207,A      3  B0247              56          19  01:00:00 00:02:04
1208,A      5  B0247              56          23  01:00:00 00:04:01
1208,B1     4  B0247              56          23  01:00:00 00:08:01
```

> **Note:**
>
> If the `rept-stat-lfs` command output in 5 shows that no **LFS** tests are being performed on the signaling link to be removed from the database, continue the procedure with 7.

6. Deactivate the **LFS** test being performed on the signaling link using the `dact-lbp` command, specifying the location signaling link being removed.

   For this example, enter this command.

   `dact-lbp:loc=1212:link=a`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:41:12 GMT  EAGLE5 36.0.0
LOC = 1212  LINK = A

CLEAR STATUS = PASS, loop-back was cleared.
```

7. Deactivate the link to be removed using the `dact-slk` command, using the output from 1 to obtain the card location and signaling link information of the signaling link to be removed.

   For this example, enter this command.

   `dact-slk:loc=1212:link=a`

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:41:12 GMT  EAGLE5 36.0.0
Deactivate Link message sent to card
```

8. Verify that the link is out of service - maintenance disabled (**OOS-MT-DSBLD**) using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter this command.

   `rept-stat-slk:loc=1212:link=a`

   This is an example of the possible output.

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1212,A   ls04      ls04clli    OOS-MT       Unavail   ----
  ALARM STATUS       = *   0235 REPT-LNK-MGTINH: local inhibited
  UNAVAIL REASON     = LI
```

9. If the signaling link to be removed is the last signaling link on a card, the card must be inhibited before the signaling link is removed. Before entering the `dlt-slk` command, enter the `rmv-card` command and specify the location of the card to be inhibited. The card location is shown in the output of `rept-stat-slk` command executed in 8 . If the signaling link to be removed is not the last signaling link on the card, continue the procedure with 10.

   In the example used for this procedure, the signaling link is the last signaling link on the card and must be inhibited. Enter this command.

   `rmv-card:loc=1212`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:41:12 GMT  EAGLE5 36.0.0
Card has been inhibited.
```

10. Remove the signaling link from the **EAGLE** 5 **ISS** using the `dlt-slk` command. If there is only one signaling link in the linkset, the `force=yes` parameter must be specified to remove the signaling link.

    In the example used in this procedure, the signaling link is the last signaling link in the linkset. Enter this command.

    `dlt-slk:loc=1212:link=a:force=yes`

    When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:41:17 GMT  EAGLE5 36.0.0
DLT-SLK: MASP A - COMPLTD
```

> **Note:**
>
> If removing the signaling link will result in 700 or less signaling links in the database and the `OAMHCMEAS` value in the `rtrv-measopts` output is on, the scheduled UI measurement reports will be enabled.

11. Verify the changes using the `rtrv-slk` command. This is an example of the possible output.

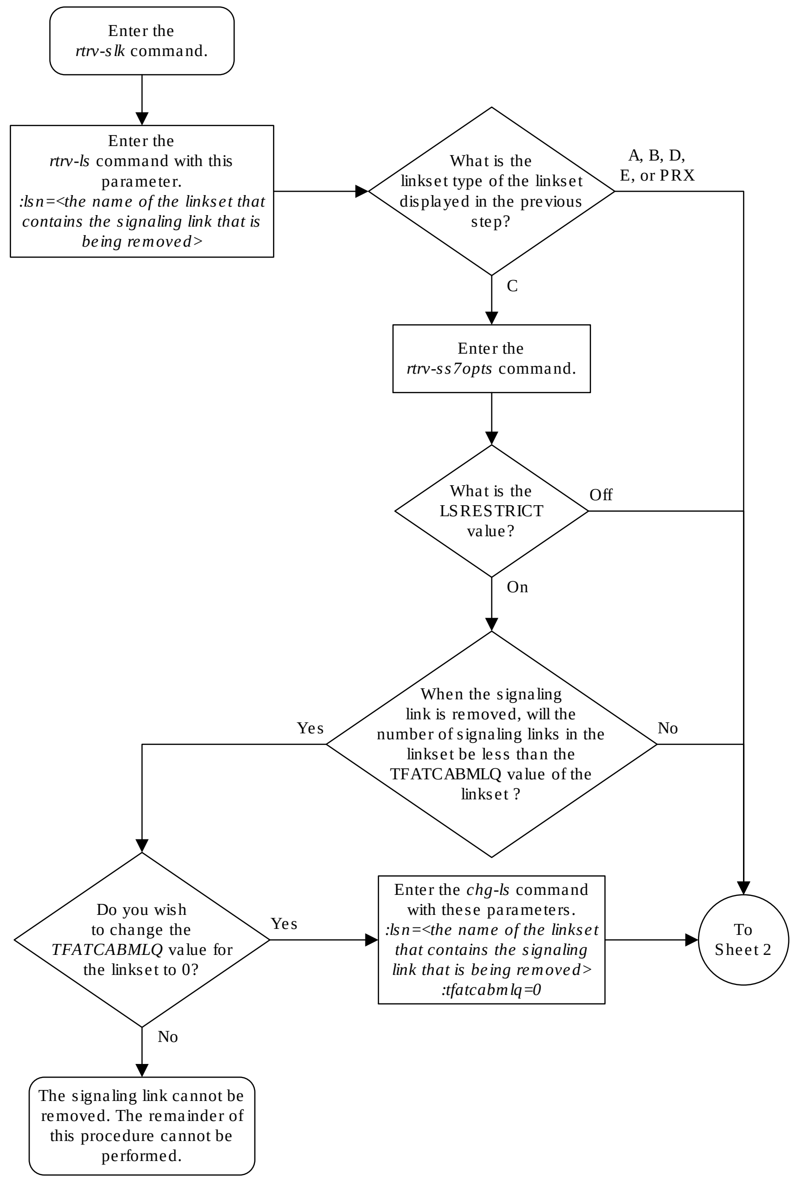
```
rlghncxa03w 09-05-19 21:16:37 GMT EAGLE5 41.0.0

                                     L2T         L1
PCR  PCR
LOC  LINK LSN         SLC TYPE      SET  BPS     MODE TSET  ECM
N1   N2
1201 A    ls01          0  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1201 B    lsa1          0  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1202 B    ls02          0  LIMDS0   2    56000   ---  ---   BASIC
---  -----
1203 A    ls03          0  LIMDS0   3    56000   ---  ---   BASIC
---  -----
1203 B    lsa2          0  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1204 B    ls01          1  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1205 A    lsa3          0  LIMDS0   4    56000   ---  ---   BASIC
---  -----
1206 A    ls02          1  LIMDS0   2    56000   ---  ---   BASIC
---  -----
1207 A    lsn1207a      0  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1207 B    lsn1207b      0  LIMDS0   1    56000   ---  ---   BASIC
---  -----
1208 B    ls03          1  LIMDS0   3    56000   ---  ---   BASIC
---  -----
1213 B    ls05          0  LIMDS0   5    56000   ---  ---   BASIC
---  -----
1214 A    lsn1214a      0  LIMDS0   2    56000   ---  ---   BASIC
---  -----
1214 B    lsa3          1  LIMDS0   4    56000   ---  ---   BASIC
---  -----
1215 A    ls05          1  LIMDS0   5    56000   ---  ---   BASIC
---  -----
1301 B    ls06          0  LIMDS0   6    56000   ---  ---   BASIC
---  -----
1304 B    ls06          1  LIMDS0   6    56000   ---  ---   BASIC
---  -----
1308 A    ls06          2  LIMDS0   6    56000   ---  ---   BASIC
---  -----
1311 A    ls01          2  LIMDS0   1    56000   ---  ---   BASIC
---  -----
```

```
1311 A1   ls05         2  LIMDS0   5    56000  ---  ---   BASIC ---  -----
1311 B    ls03         2  LIMDS0   3    56000  ---  ---   BASIC ---  -----
1311 B1   ls07         1  LIMDS0   7    56000  ---  ---   BASIC ---  -----
1313 A    ls07         0  LIMDS0   7    56000  ---  ---   BASIC ---  -----
1315 A    lsn5         0  LIMDS0   11   56000  ---  ---   BASIC ---  -----
1317 A    lsi7         0  LIMDS0   11   56000  ---  ---   BASIC ---  -----

                                   LP            ATM
LOC   LINK LSN          SLC TYPE   SET  BPS      TSEL      VCI    VPI    LL
1302 A    atmansi0       0  LIMATM  3    1544000 EXTERNAL  35     15     0
1305 A    atmansi1       0  LIMATM  4    1544000 INTERNAL  100    20     2
1318 A    atmansi0       1  LIMATM  9    1544000 LINE      150    25     4

                                   LP         ATM                     E1ATM
LOC   LINK LSN          SLC TYPE   SET BPS    TSEL      VCI    VPI  CRC4  SI
SN
2101 A    atmitu1        0  LIME1ATM 5   2.048M LINE      150    2    ON    1
20
2105 A    atmitu1        1  LIME1ATM 5   2.048M LINE      35     15   ON    2
15

SLK table is (31 of 1200) 3% full
```

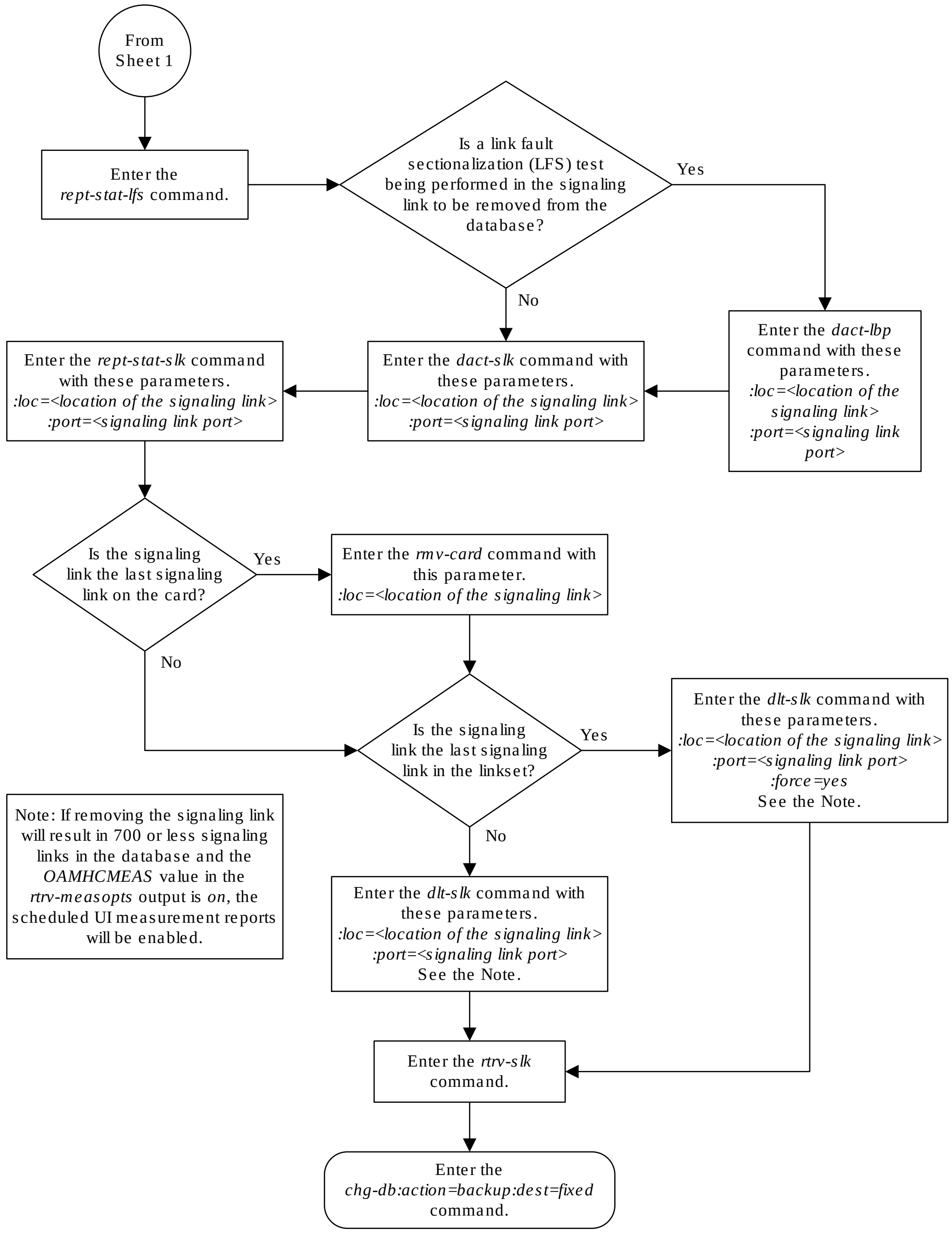
12. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-17 Removing an SS7 Signaling Link



Sheet 1 of 2



Sheet 2 of 2

3.20 Adding a Route Containing an SS7 DPC

This procedure is used to add a route containing an **SS7 DPC** to the database using the `ent-rte` command. The routes configured in this procedure do not contain cluster point codes as DPCs, or **IPGWx** linksets. These routes are configured in these procedures:

- Adding a Route Containing a Cluster Point Code
- Adding a Route Containing an IPGWx Linkset

The `ent-rte` command uses these parameters.

`:dpc/dpca/dpci/dpcn/dpcn24 – The` destination point code of the node that the traffic is being sent to.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes.

`:lsn` – The name of the linkset that will carry the traffic to the node specified by the destination point code.

`:rc –` The relative cost (priority) for this route.

`:force –` This parameter allows a route to be added to the database even if the linkset to be assigned to the route does not have any signaling links in it.

These items must be configured in the database before a route can be added in this procedure:

- Destination point code (DPC) – see one of these procedures depending on the type of point code required:
  – For a Network Routing DPC – see Adding a Network Routing Point Code.
  – For all other DPCs – see Adding a Destination Point Code
- Linkset – see Adding an SS7 Linkset
- Link – see Adding an SS7 Signaling Link.

The linkset assigned to this route must have an adjacent point code (**APC**) in the SS7 domain. The domain of the DPC is shown in the `DMN` field in the output of the `rtrv-dstn` command.

The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Alias point codes and secondary point codes cannot be used. True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields. Private point codes cannot be used as the DPC of a route in this procedure. Routes that have private point codes as the DPC of a route can contain only IPGWx linksets. Perform the Adding a Route Containing an IPGWx Linkset procedure to add routes containing IPGWx linksets.

The DPC of the route is the destination point code to be reached by the route and is shown in the output of the `rtrv-rte` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields.

The APCA, APCI, APCN, and APCN24 fields in the output of the rtrv-rte command show the point code of the node that is directly adjacent to the node in the route.

A linkset can only be entered once as a route for each DPC.

A maximum of six routes can be defined for each DPC.

If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six routes in the routeset can be assigned the same relative cost value. It is recommended that the routeset be provisioned with a group of four routes that have the same relative cost value and another group of two routes that have the same relative cost value. Three or five routes in the routeset that have the same relative cost value can be provisioned, but the odd number makes it more difficult to distribute the route traffic evenly. Six routes in the routeset that have the same relative cost value can be provisioned, but this does not allow for any backup routes and also offers the worst chance for congestion and queuing issues during network failures. If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, a maximum of two linksets can be assigned the same relative cost value. The relative cost value of the route is defined by the rc parameter of the ent-rte command and is shown in the RC field in the output of the rtrv-rte command.

The force=yes parameter must be specified if the specified linkset has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

The ANSI DPC (DPC/DPCA) of the route can use either a full point code or a network routing point code. ITU DPCs (DPCI, DPCN, and DPCN24) must use full point codes. For more information on network routing point codes, go to the Network Routing section.

If the DPC of the route is a network routing point code, only linksets, specified with either the lsn or nlsn parameters, whose linkset type is either B, C, or D can be assigned to the route. The linkset type is shown in the LST field of the rtrv-ls command output. If the linkset type of the desired linkset is either A, E, or PRX, one of three actions must be taken.

- Choose another linkset with the linkset type B, C, or D.
- Change the linkset type of an existing linkset - perform the Changing an SS7 Linkset procedure.
- Add a new linkset to the database with the necessary signaling links and the linkset type B, C, or D.
  1. Perform the Adding an SS7 Linkset procedure to add the linkset.
  2. If the necessary signaling links are not in the database, go to the Adding an SS7 Signaling Link procedure and add the signaling links to the database.

If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (ncai parameter of either the ent-dstn or chg-dstn command) is set to no, then the route to the **DPC** must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code. For more information, see the Nested Cluster Routing section.

For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the MULTGC value set to yes, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the MULTGC value is set to no, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.

When a new route is being added and the DPC of that route contains a proxy point code, the first route assigned to this DPC must be a linkset whose linkset type is PRX and must have a proxy point code assigned to the linkset. The proxy point code that is assigned to the linkset must be the proxy point code that is assigned to the DPC of the route. After this route has been added, other routes can be added to this DPC. The linksets for these routes can contain proxy point codes, but do not have to contain proxy point codes.

Canceling the `RTRV-LS`, `RTRV-DSTN`, and `RTRV-RTE` Commands

Because the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered, from another terminal other that the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current route configuration using the `rtrv-rte` command. This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   140-012-004    1-111-1    10-13-12-1    ls000001   10
240-012-002
                                           ls000002   10
240-012-002
                                           ls000003   20
240-012-002
                                           ls000004   30
240-012-002
                                           ls000005   40
240-012-002
                                           ls000006   50
240-012-002
                                               RTX:No   CLLI=dp1
   140-012-005 1-111-2 10-13-12-2          ls000001   10
240-012-002
                                           ls000002   10
240-012-002
                                           ls000003   20
240-012-002
```

```
                                         ls000004   30    240-012-002
                                         ls000005   40    240-012-002
                                         ls000006   50    240-012-002
                                             RTX:No  CLLI=dp2
DPCI        ALIASN/N24       ALIASA      LSN         RC    APC
2-234-5     11-13-3-3       240-111-111  ls100001   10    1-234-5
                                         ls100002   10    1-234-6
                                         ls100003   20    1-234-7
                                         ls100004   30    1-234-1
                                         ls100005   40    1-234-2
                                         ls100006   50    1-234-3
                                             RTX:No  CLLI=idp1
DPCN              ALIASA          ALIASI LSN         RC    APC
12-12-13-3        011-222-111     0-001-1 ls200001   10    10-13-9-3
                                         ls200002   10    10-13-10-0
                                         ls200003   20    10-13-10-1
                                         ls200004   30    10-13-10-2
                                         ls200005   40    10-13-10-3
                                         ls200006   50    10-13-11-0
                                             RTX:No  CLLI=ndp1

DPCN24            ALIASA          ALIASI LSN         RC    APC
```

If the destination point code of the route being added in this procedure is not shown in the `rtrv-rte` output, perform one of these procedures in Chapter 2 to add the destination point code of the route to the destination point code table.

- For a Network Routing **DPC** – Adding a Network Routing Point Code.
- For all other **DPCs** – Adding a Destination Point Code.
  After the new DPC has been added, continue the procedure by performing one of these steps.
  – If a proxy point code was assigned to the new DPC that was added, continue this procedure with 2.
  – If a proxy point code was not assigned to the new DPC that was added, continue the procedure by performing one of these steps.
    * If no more than two routes in the routeset will have the same relative cost value, and the new DPC is a member of a cluster, continue the procedure with 6.
    * If no more than two routes in the routeset will have the same relative cost value, and the new DPC is not a member of a cluster, continue the procedure with 7.
    * If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
      * If the new DPC is a member of a cluster, continue the procedure with 6.
      * If the new DPC is not a member of a cluster, continue the procedure with 7.

* If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 5.

If the destination point code of the route being added in this procedure is shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.

- If the DPC that you wish to add the route to contains six routes, no more routes can be added to this DPC. A DPC of a route can contain a maximum of six routes. Choose another DPC to add the routes to and repeat this step.
- If the DPC that you wish to add the route to is a network routing point code, or already has at least one route assigned to it, continue the procedure by performing one of these steps.
  – If no more than two routes in the routeset will have the same relative cost value, and the DPC is a member of a cluster, continue the procedure with 6.
  – If no more than two routes in the routeset will have the same relative cost value, and the DPC is not a member of a cluster, continue the procedure with 7.
  – If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
    * If the DPC is a member of a cluster, continue the procedure with 6.
    * If the DPC is not a member of a cluster, continue the procedure with 7.
  – If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 5.
- If the DPC that you wish to add the route to is not a network routing point code, and has no routes assigned to it, continue this procedure with 2.

2. The first route to a DPC that contains a proxy point code must be a linkset whose linkset type is `PRX`. This linkset must contain the proxy point code that is assigned to the DPC of the route..

   Verify if the DPC of the route contains a proxy point code by entering the `rtrv-dstn` command with the DPC of the route. For this example, enter this command.

   `rtrv-dstn:dpca=003-003-003`

   This is an example of the possible output.

```
rlghncxa03w 10-12-15 09:22:39 EST  43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   003-003-003    ----------- no  --- ----------
--------------    SS7

   PPCA          NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
```

```
SCCPMSGCNV
   010-010-010  ---- no      none   off   none     no      no     none

Destination table is (14 of 2000) 1% full
Alias table is (0 of 12000) 0% full
PPC table is (2 of 10) 20% full
```

If a proxy point code is not shown in this step, continue the procedure by performing one of these steps.

- If no more than two routes in the routeset will have the same relative cost value, and the DPC is a member of a cluster, continue the procedure with 6.
- If no more than two routes in the routeset will have the same relative cost value, and the DPC is not a member of a cluster, continue the procedure with 7.
- If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
  - If the DPC is a member of a cluster, continue the procedure with 6.
  - If the DPC is not a member of a cluster, continue the procedure with 7.
- If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 5.

If a proxy point code is shown in this step, continue this procedure with 3.

3. Display the linksets that contain the proxy point code that is assigned to the DPC of the route by entering the `rtrv-ls` command with the proxy point code. For this example, enter this command.

   `rtrv-ls:ppca=010-010-010`

   This is an example of the possible output.

```
rlghncxa03w 07-08-15 09:50:20 EST  37.0.0

PPCA    =    010-010-010

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn3          003-003-003   none 1   1   no  PRX 2    off off off no
off
lsn5          012-012-012   none 1   1   no  PRX 2    off off off no
off
lsn15         015-015-015   none 1   1   no  PRX 2    off off off no
off


Link set table is (11 of 1024) 1% full.
```

The linkset that is being assigned to the DPC of the route must be shown in this step. The APC of this linkset must be the same as the DPC of the route. If this linkset is not shown in this step, perform the Adding an SS7 Linkset procedure to add a linkset that contains these attributes.

- The APC of the linkset must be the same as the DPC of the route.
- The linkset type must be `PRX`.
- The proxy point code that is assigned to the DPC of the route must be assigned to the linkset.

After the linkset has been added, continue the procedure with 4.

If a linkset is shown in this step whose APC is the same as the DPC of the route, continue the procedure with 4.

4. Add the route containing the proxy linkset (the linkset type is PRX) using the `ent-rte` command. For this example, enter this command.

   `ent-rte:dpca=003-003-003:lsn=lsn3:rc=10`

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
   ENT-RTE: MASP A - COMPLTD
   ```

   Other routes can be added to this DPC. If you wish to add more routes, continue the procedure by performing one of these steps.

   - If no more than two routes in the routeset will have the same relative cost value, and the DPC is a member of a cluster, continue the procedure with 6.
   - If no more than two routes in the routeset will have the same relative cost value, and the DPC is not a member of a cluster, continue the procedure with 7.
   - If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
     - If the DPC is a member of a cluster, continue the procedure with 6.
     - If the DPC is not a member of a cluster, continue the procedure with 7.
   - If more than two routes in the routeset will have the same relative cost value, and routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 5.

   If you do not wish to add more routes to this DPC, continue the procedure with 10.

5. For a routeset to have more than two routes with the same relative cost value, the 6-Way Loadsharing on Routesets feature must be enabled and turned on.

   To verify the status of the 6-Way Loadsharing on Routesets feature, enter this command.

   `rtrv-ctrl-feat:partnum=893019801`

   The following is an example of the possible output.

   ```
   rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
   ```

```
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, perform the Activating the 6-Way Loadsharing on Routesets Feature procedure to enable and turn on the 6-Way Loadsharing on Routesets feature.

After the 6-Way Loadsharing on Routesets feature has been enabled and turned on, or if the `rtrv-ctrl-feat` output shows that the 6-Way Loadsharing on Routesets feature is enabled and turned on, continue this procedure by performing one of these steps.

- If the DPC is a member of a cluster, continue the procedure with 6.
- If the DPC is not a member of a cluster, continue the procedure with 7.

6. Display the `ncai` parameter value assigned to the cluster point code using the `rtrv-dstn` command and specifying the cluster point code. If the `ncai` parameter value is `no`, then the route to the DPC must be the same as the route to the cluster point code. If the `ncai` parameter value is `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code. The `ncai` value is shown in the `NCAI` field of the `rtrv-dstn` output. For this example, enter this command.

   `rtrv-dstn:dpca=111-011-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI         BEI ELEI   ALIASI          ALIASN/N24     DMN
   111-011-*      rlghncbb000  yes yes ----------      --------------    SS7

   SPCA          NCAI          RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------   yes           none   off   none     no     no    none

Destination table is (12 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

   If the `ncai` parameter value of the cluster point code is `no`, and you wish to change the `ncai` parameter value to `yes`, perform the Changing the Attributes of a Cluster Point Code procedure. If the `ncai` parameter value of the cluster point code is `no`, and you do not wish to change the `ncai` parameter value to `yes`, add a new DPC for the route by performing either the Adding a Destination Point Code procedure or the Adding a Network Routing Point Code procedure.

7. Verify that the required linkset for the route is in the database by displaying the linksets in the database with the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                    L3T SLT             GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2          001-207-000    none 1   1   no  B   6    off off off
no    off
ls1305        000-005-000    none 1   1   no  A   1    off off off
no    off
ls1307        000-007-000    none 1   1   no  A   1    off off off
no    off
lsn7          002-002-002    none 1   1   no  C   8    off off off
no    off
e1m1s1        001-001-001    none 1   1   no  A   7    off off off
no    off
e1m1s2        001-001-002    none 1   1   no  A   7    off off off
no    off

                                    L3T SLT             GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i         1-207-0        none 1   1   no  B   4    off off off
---   on
ls1315        0-015-0        none 1   1   no  A   1    off off off
---   off
ls1317        0-017-0        none 1   1   no  A   1    off off off
---   on
ls7890        7-089-0        none 1   2   no  B   1    off off off
---   off
e1m2s1        1-011-1        none 1   1   no  A   7    off off off
---   off
e1m2s2        1-011-2        none 1   1   no  A   7    off off off
---   off

Link set table is (12 of 1024) 1% full.
```

   If the required linkset is not in the database, perform the Adding an SS7 Linkset procedure to add the linkset to the database with the `ipgwapc=no` parameter value. The APC of the linkset cannot be a private point code. Continue the procedure with 8.

8. Display each linkset being assigned to the route to verify the `multgc` and `ipgwapc` parameter values with the `rtrv-ls` command, specifying the name of the linkset that will be assigned to the route.

   If the `multgc` linkset parameter value is `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `multgc` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route. The `multgc` value is shown in the `MULTGC` field of the `rtrv-ls` output. Linksets that have the `ipgwapc=yes` parameter value are assigned to routes using the Adding a Route Containing an IPGWx Linkset procedure. If the linkset displayed in this step contains the `ipgwapc=yes` parameter, repeat this step with another linkset shown in 7. If all the linksets have been displayed, and the `ipgwapc` value for all the linksets is `yes`, add the desired linkset by performing Adding an SS7 Linkset with the `ipgwapc=no` parameter value. The APC of the linkset cannot be a private point code.

For this example, enter the following commands.

`rtrv-ls:lsn=lsn7`

This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                   L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)   SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn7          002-002-002     none 1   1   no  C   8    off off off no
off

           CLLI          TFATCABMLQ MTPRSE ASL8
           -----------   4          ---    no

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

                                    L2T              PCR  PCR
           LOC  PORT SLC TYPE       SET  BPS    ECM   N1   N2
           1211 A      0 LIMDS0     1    56000  BASIC ---  -----
           1211 B      1 LIMDS0     1    56000  BASIC ---  -----
           1211 A1     2 LIMDS0     1    56000  BASIC ---  -----
           1211 A2     3 LIMDS0     1    56000  BASIC ---  -----
           1211 B2     4 LIMDS0     1    56000  BASIC ---  -----
           1211 B1     5 LIMDS0     1    56000  BASIC ---  -----
           1211 B3     6 LIMDS0     1    56000  BASIC ---  -----
           1211 A3     7 LIMDS0     1    56000  BASIC ---  -----

Link set table is (12 of 1024) 1% full.
```

`rtrv-ls:lsn=ls7890`

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                   L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)   SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls7890        7-089-0         none 1   2   no  B   1    off off off ---
off

           CLLI          TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
```

```
    dtaclli       1           no      ---   none      1        no

    ITUTFR
    off

    IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
    no      ---------- ---   ---      ---       CdPA

                             L2T               PCR   PCR
    LOC   PORT SLC TYPE      SET   BPS    ECM   N1    N2
    1103  A      0  LIMDS0   11    56000  BASIC ---   -----

Link set table is (12 of 1024) 1% full.
```

9. Add the route using the `ent-rte` command. For this example, enter these commands.

   `ent-rte:dpca=002-002-200:lsn=lsn7:rc=10`

   `ent-rte:dpci=7-089-0:lsn=ls7890:rc=20`

   `ent-rte:dpca=003-003-003:lsn=lsn7:rc=20`

   These are the rules that apply to adding a route.

   - The `force=yes` parameter must be specified if the linkset being assigned to the route has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.
   - A route can contain a maximum of six linksets.
   - A maximum of two linksets can be assigned the same `rc` parameter value, if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six linksets in the route can have the same `rc` parameter value.
   - If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to `no`, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code.
   - For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the `MULTGC` value set to `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `MULTGC` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.
   - The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Alias point codes and secondary point codes cannot be used. True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields.

- Private point codes can be specified as the DPC of a route only if the linkset assigned to the route is an IPGWx linkset (a linkset that has the `ipgwapc=yes` parameter assigned to it).
- If the DPC of the route is a network routing point code, the link set type of the linkset assigned to the route must be either B, C, or D.

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
ENT-RTE: MASP A - COMPLTD
```

10. Verify the changes using the `rtrv-rte` command, specifying the destination point code of the route.

    For this example, enter these commands.

    `rtrv-rte:dpca=002-002-200`

    This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0

   DPCA            ALIASI      ALIASN/N24     LSN         RC    APCA
   002-002-002 ---------- --------------    lsn7        10    002-002-002
                                                RTX:No   CLLI=-----------
```

    `rtrv-rte:dpci=7-089-0:lsn=ls7890:rc=20`

    This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0

   DPCI        ALIASN/N24        ALIASA       LSN         RC    APC
   7-089-0 --------------   -------------- ls7890      10    7-089-0
                                                RTX:No   CLLI=dtaclli
```

    `rtrv-rte:dpca=003-003-003`

    This is an example of the possible output.

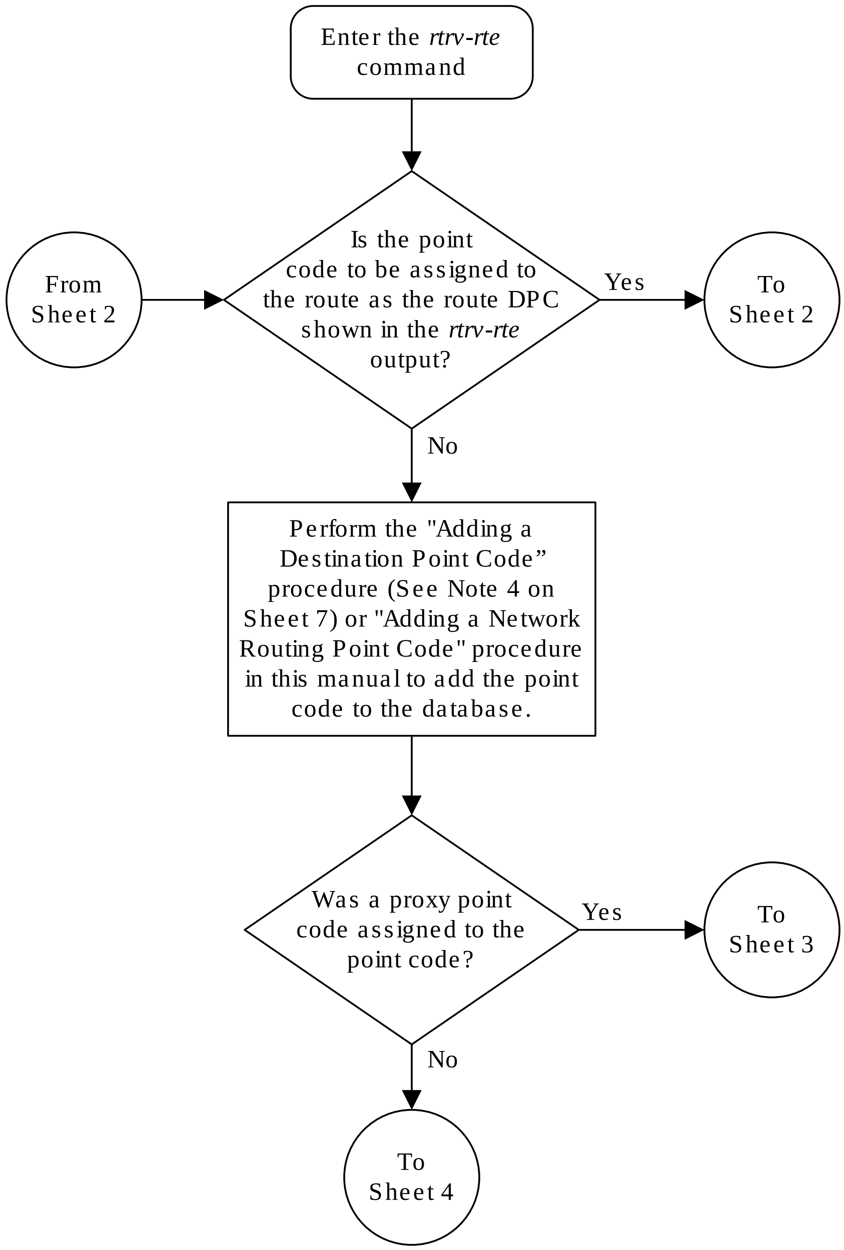
```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0

   DPCA            ALIASI      ALIASN/N24     LSN         RC    APCA
   003-003-003 ---------- --------------    lsn3        10    003-003-003
                                             lsn7        20    002-002-002
                                                RTX:No   CLLI=-----------
```

11. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

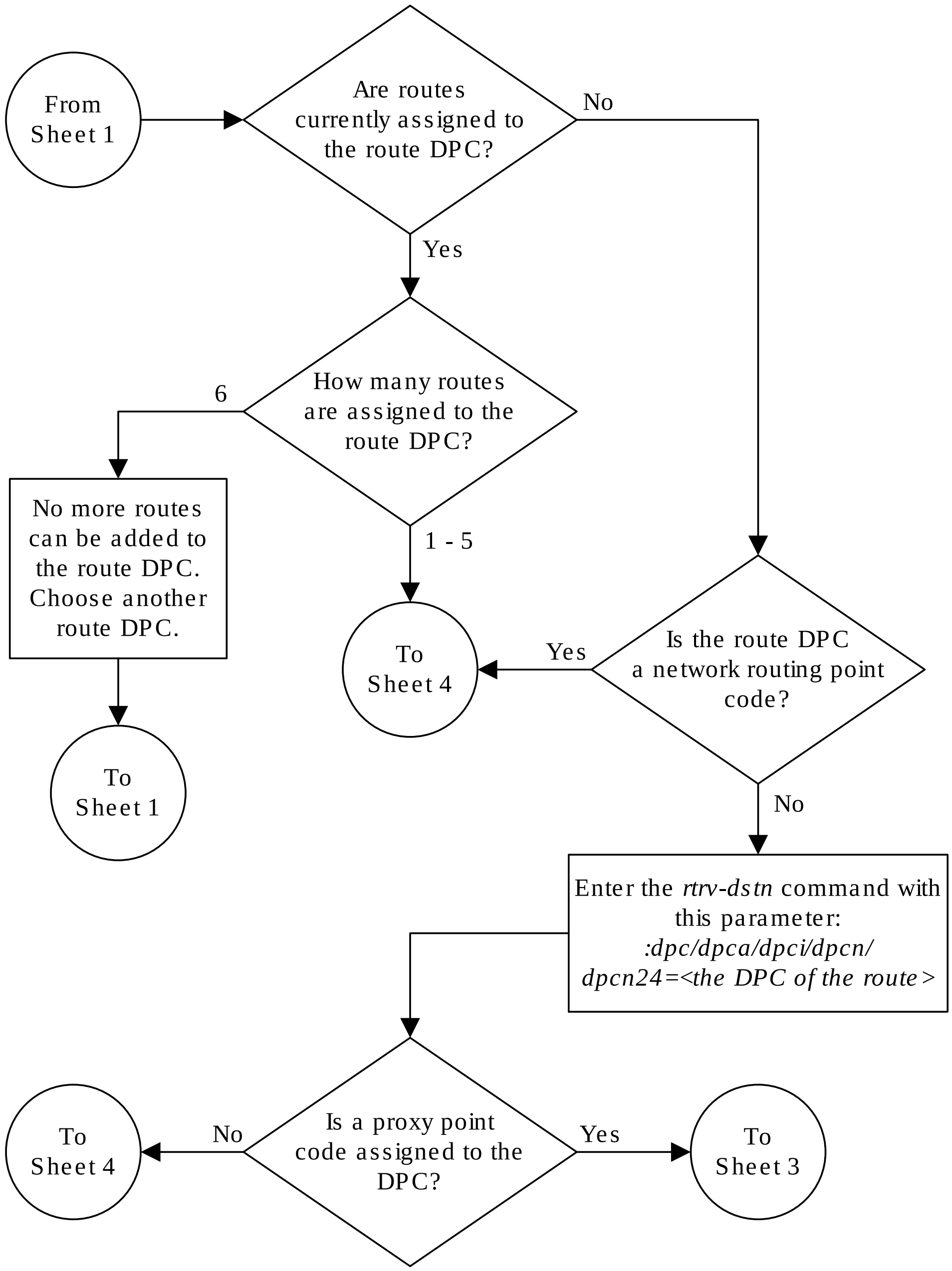
These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

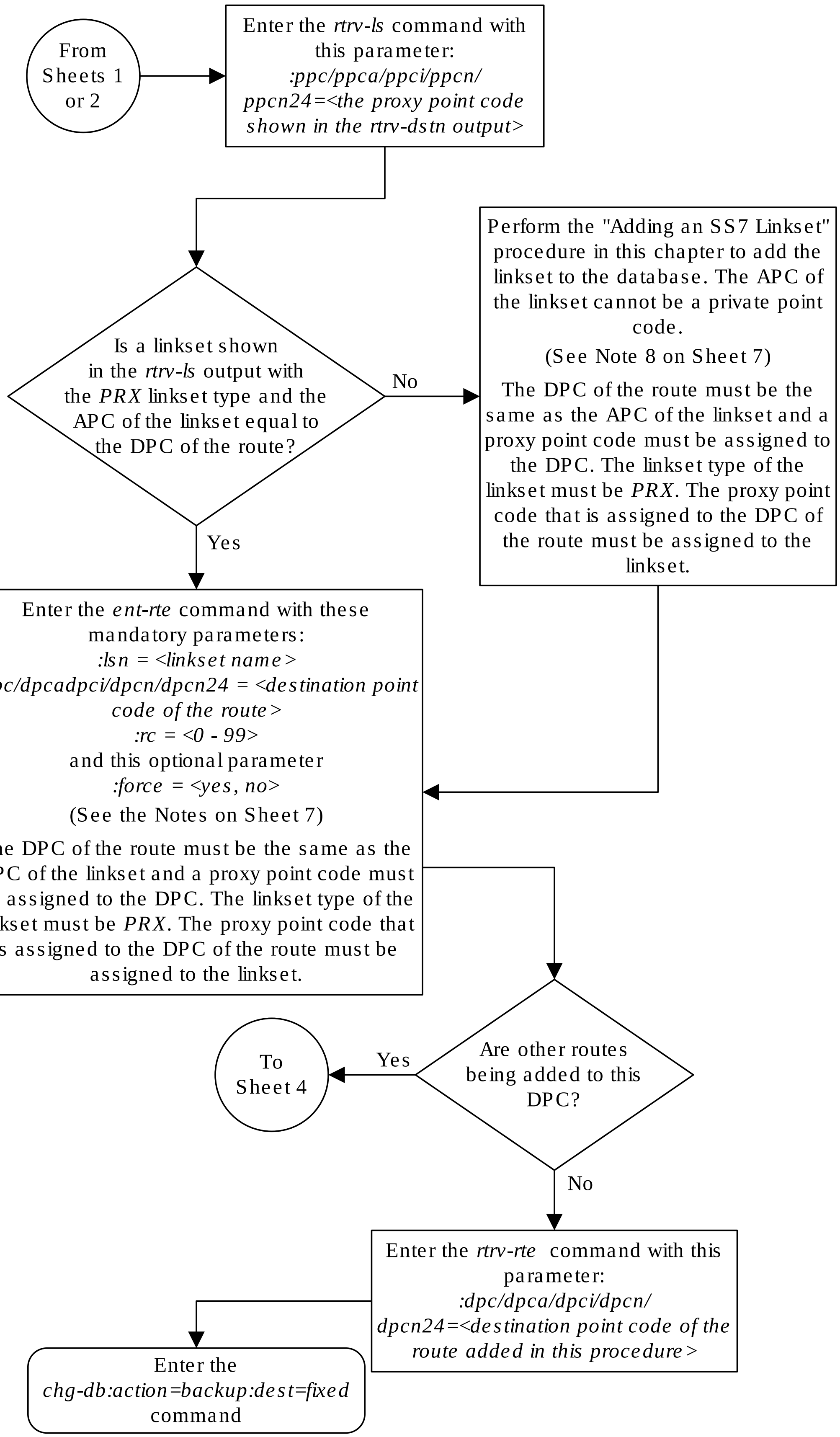
Figure 3-18 Adding a Route Containing an SS7 DPC



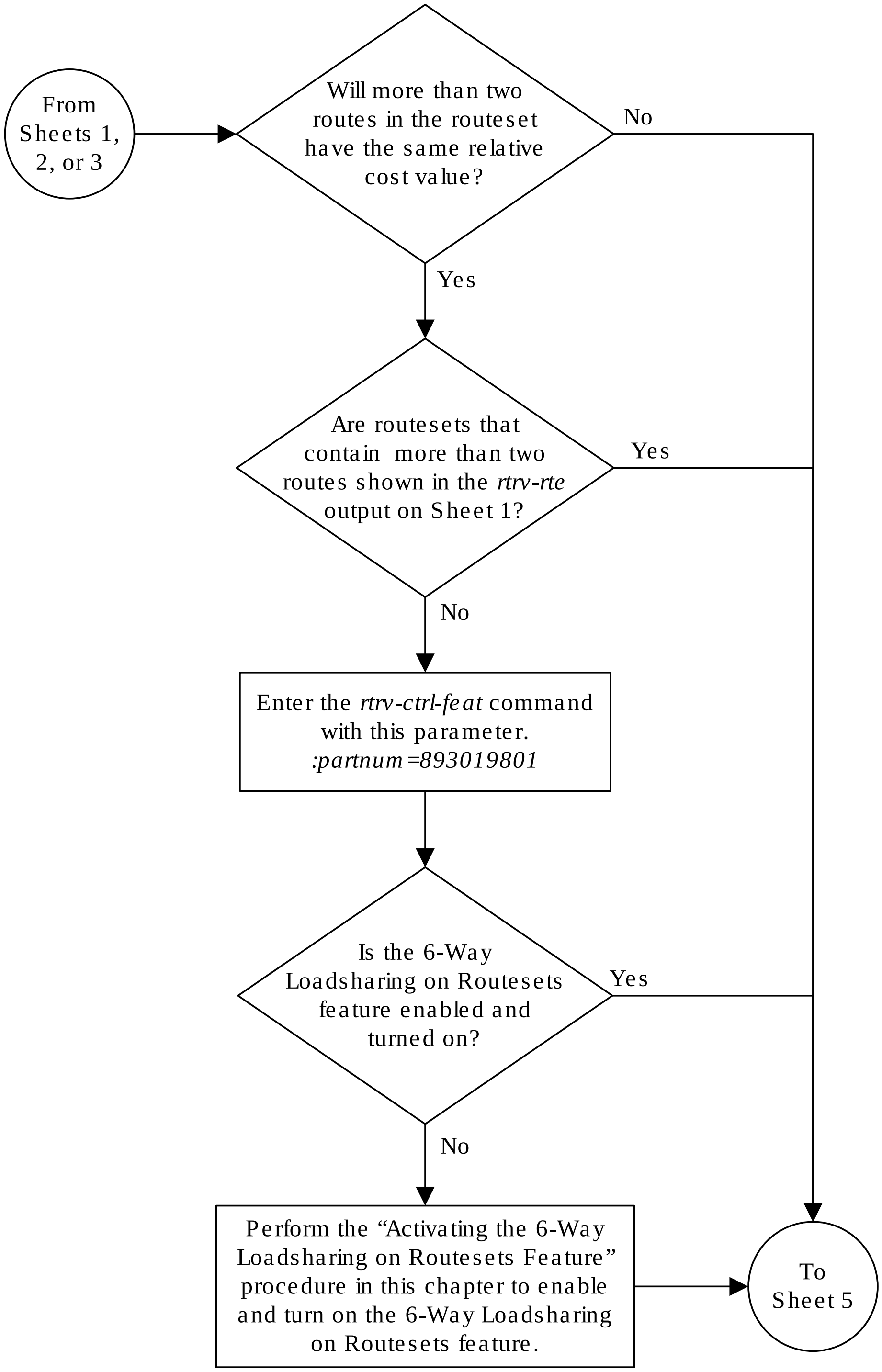
Sheet 1 of 7


From Sheet 1
Are routes currently assigned to the route DPC?
No
Yes
How many routes are assigned to the route DPC?
6
1 - 5
No more routes can be added to the route DPC. Choose another route DPC.
To Sheet 1
To Sheet 4
Yes
Is the route DPC a network routing point code?
No
Enter the *rtrv-dstn* command with this parameter:
:dpc/dpca/dpci/dpcn/ dpcn24=<the DPC of the route>
Is a proxy point code assigned to the DPC?
No
To Sheet 4
Yes
To Sheet 3

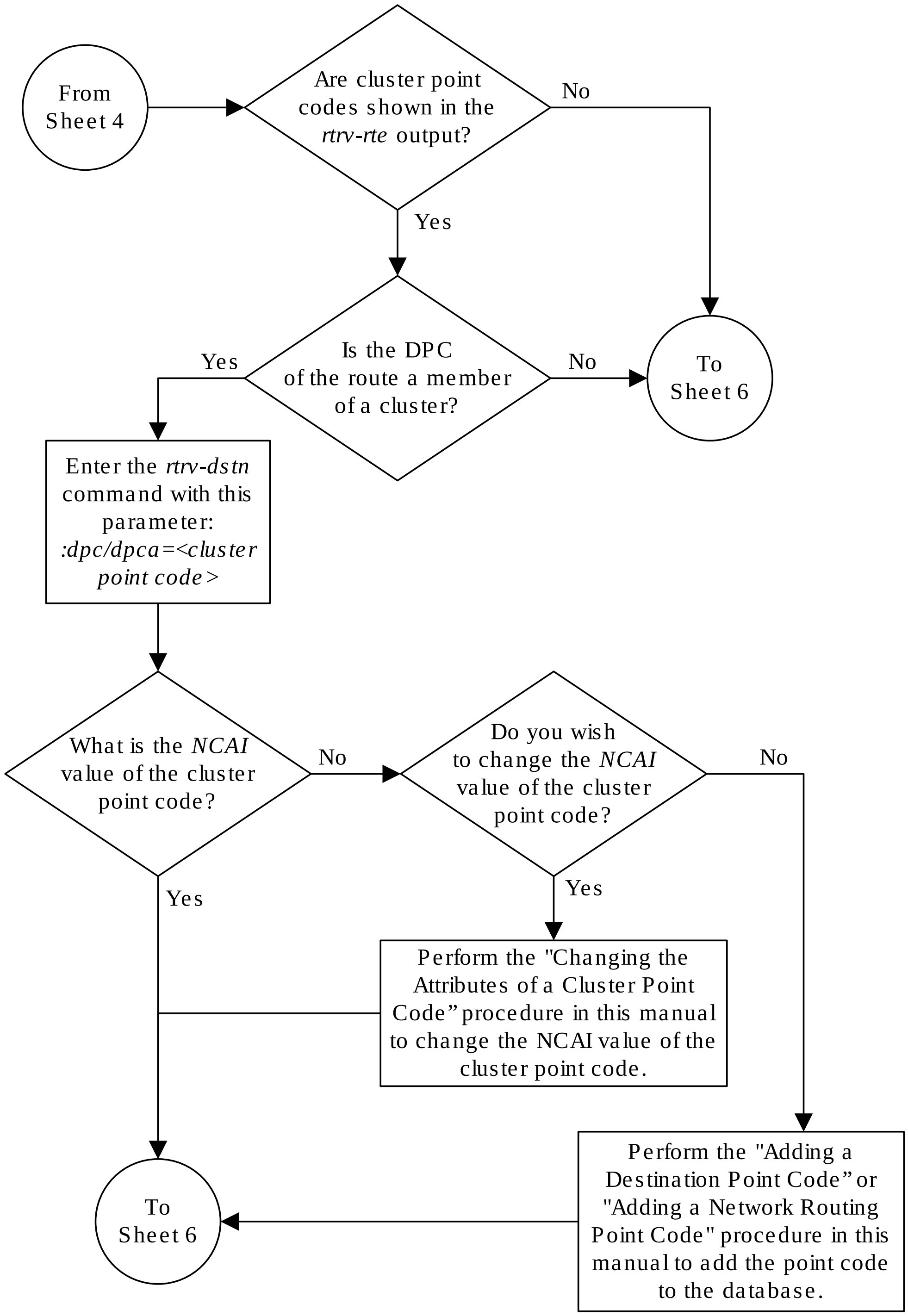
Sheet 2 of 7


From Sheets 1 or 2
Enter the rtrv-ls command with this parameter: :ppc/ppca/ppci/ppcn/ ppcn24=<the proxy point code shown in the rtrv-dstn output>
Is a linkset shown in the rtrv-ls output with the PRX linkset type and the APC of the linkset equal to the DPC of the route?
No
Perform the "Adding an SS7 Linkset" procedure in this chapter to add the linkset to the database. The APC of the linkset cannot be a private point code.
(See Note 8 on Sheet 7)
The DPC of the route must be the same as the APC of the linkset and a proxy point code must be assigned to the DPC. The linkset type of the linkset must be PRX. The proxy point code that is assigned to the DPC of the route must be assigned to the linkset.
Yes
Enter the ent-rte command with these mandatory parameters: :lsn = <linkset name> :dpc/dpcadpci/dpcn/dpcn24 = <destination point code of the route> :rc = <0 - 99> and this optional parameter :force = <yes, no>
(See the Notes on Sheet 7)
The DPC of the route must be the same as the APC of the linkset and a proxy point code must be assigned to the DPC. The linkset type of the linkset must be PRX. The proxy point code that is assigned to the DPC of the route must be assigned to the linkset.
Are other routes being added to this DPC?
Yes
To Sheet 4
No
Enter the rtrv-rte command with this parameter: :dpc/dpca/dpci/dpcn/ dpcn24=<destination point code of the route added in this procedure>
Enter the chg-db:action=backup:dest=fixed command

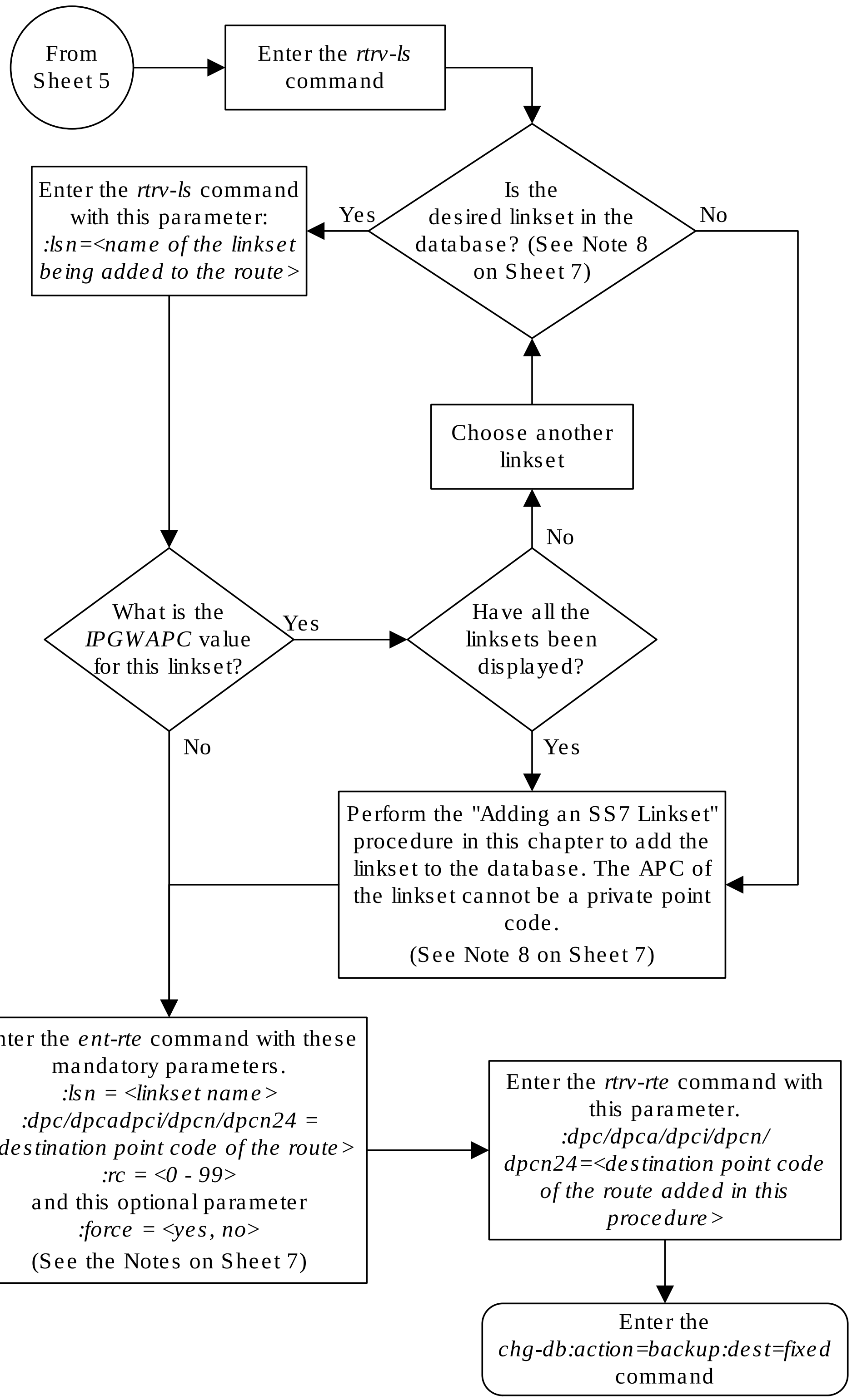
Sheet 3 of 7


From Sheets 1, 2, or 3
Will more than two routes in the routeset have the same relative cost value?
No
Yes
Are routesets that contain more than two routes shown in the *rtrv-rte* output on Sheet 1?
Yes
No
Enter the *rtrv-ctrl-feat* command with this parameter. *:partnum=893019801*
Is the 6-Way Loadsharing on Routesets feature enabled and turned on?
Yes
No
Perform the “Activating the 6-Way Loadsharing on Routesets Feature” procedure in this chapter to enable and turn on the 6-Way Loadsharing on Routesets feature.
To Sheet 5

Sheet 4 of 7


From Sheet 4
Are cluster point codes shown in the *rtrv-rte* output?
No
Yes
Is the DPC of the route a member of a cluster?
Yes
No
To Sheet 6
Enter the *rtrv-dstn* command with this parameter: *:dpc/dpca=<cluster point code>*
What is the *NCAI* value of the cluster point code?
No
Do you wish to change the *NCAI* value of the cluster point code?
No
Yes
Yes
Perform the "Changing the Attributes of a Cluster Point Code" procedure in this manual to change the NCAI value of the cluster point code.
To Sheet 6
Perform the "Adding a Destination Point Code" or "Adding a Network Routing Point Code" procedure in this manual to add the point code to the database.

Sheet 5 of 7


From Sheet 5
Enter the rtrv-ls command
Is the desired linkset in the database? (See Note 8 on Sheet 7)
Yes
No
Enter the rtrv-ls command with this parameter: :lsn=<name of the linkset being added to the route>
Choose another linkset
No
What is the IPGWAPC value for this linkset?
Yes
Have all the linksets been displayed?
No
Yes
Perform the "Adding an SS7 Linkset" procedure in this chapter to add the linkset to the database. The APC of the linkset cannot be a private point code.
(See Note 8 on Sheet 7)
Enter the ent-rte command with these mandatory parameters.
:lsn = <linkset name>
:dpc/dpcadpci/dpcn/dpcn24 = <destination point code of the route>
:rc = <0 - 99>
and this optional parameter
:force = <yes, no>
(See the Notes on Sheet 7)
Enter the rtrv-rte command with this parameter.
:dpc/dpca/dpci/dpcn/dpcn24=<destination point code of the route added in this procedure>
Enter the chg-db:action=backup:dest=fixed command

Sheet 6 of 7

Notes:

1. The *force=yes* parameter must be specified if the linkset being assigned to the route has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

2. A route can contain a maximum of six linksets.

3. A maximum of two linksets can be assigned the same *rc* parameter value, if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six linksets in the route can have the same *rc* parameter value.

4. If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (*ncai* parameter of either the *ent-dstn* or *chg-dstn* command) is set to no, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code.

5. For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the MULTGC value set to yes, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the MULTGC value is set to no, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.

6. The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs. The DPC of the route must be defined as a true point code in the *rtrv-dstn* output. Alias point codes and secondary point codes cannot be used. True point codes are shown in the output of the *rtrv-dstn* command in the *DPCA*, *DPCI*, *DPCN*, or *DPCN24* fields.

7. Private point codes can be specified as the DPC of a route only if the linkset assigned to the route is an IPGWx linkset (a linkset that has the *ipgwapc=yes* parameter assigned to it).

8. If the DPC of the route is a network routing point code, the link set type of the linkset assigned to the route must be either B, C, or D.

Sheet 7 of 7

3.21 Adding a Route Containing a Cluster Point Code

This procedure is used to add a route to the database containing a cluster point code as the **DPC** of the route using the `ent-rte` command. Routes that do not contain a cluster point code as the DPC of the route are configured in these procedures:

- Adding a Route Containing an SS7 DPC
- Adding a Route Containing an IPGWx Linkset

The `ent-rte` command uses these parameters.

`:dpc/dpca` – The destination point code (cluster point code) of the node that the traffic is being sent to.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE 5 ISS.

`:lsn` – The name of the linkset that will carry the traffic to the node specified by the destination point code.

`:rc` – The relative cost (priority) for this route.

`:force` – This parameter allows a route to be added to the database even if the linkset to be assigned to the route does not have any signaling links in it.

These items must be configured in the database before a route can be added:

- Destination point code (DPC) – see Adding a Cluster Point Code
- Linkset – see Adding an SS7 Linkset
- Link – see Adding an SS7 Signaling Link

The linkset assigned to this route must have an adjacent point code (**APC**) in the SS7 domain. The domain of the DPC is shown in the `DMN` field in the output of the `rtrv-dstn` command.

The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing **ANSI** DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Alias point codes and secondary point codes cannot be used. True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields. Private point codes cannot be used as the DPC of a route in this procedure. Routes that have private point codes as the DPC of a route can contain only **IPGWx** linksets. Perform the Adding a Route Containing an IPGWx Linkset procedure to add routes containing IPGWx linksets.

The DPC of the route is the destination point code to be reached by the route and is shown in the output of the rtrv-rte command in the DPCA, DPCI, DPCN, or DPCN24 fields.

The APCA, APCI, APCN, and APCN24 fields in the output of the rtrv-rte command show the point code of the node that is directly adjacent to the node in the route.

A linkset can only be entered once as a route for each DPC.

A maximum of six routes can be defined for each DPC.

If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six routes in the routeset can be assigned the same relative cost value. It is recommended that the routeset be provisioned with a group of four routes that have the same relative cost value and another group of two routes that have the same relative cost value. Three or five routes in the routeset that have the same relative cost value can be provisioned, but the odd number makes it more difficult to distribute the route traffic evenly. Six routes in the routeset that have the same relative cost value can be provisioned, but this does not allow for any backup routes and also offers the worst chance for congestion and queuing issues during network failures. If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, a maximum of two linksets can be assigned the same relative cost value. The relative cost value of the route is defined by the rc parameter of the ent-rte command and is shown in the RC field in the output of the rtrv-rte command.

The force=yes parameter must be specified if the specified linkset has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

If the DPC of the route is a cluster point code, only linksets whose linkset type is either B, C, or D can be assigned to the route. The linkset type is shown in the LST field of the rtrv-ls command output. If the linkset type of the desired linkset is either A, E, or PRX, one of three actions must be taken.

- Choose another linkset with the linkset type B, C, or D.
- Change the linkset type of an existing linkset – perform the Changing an SS7 Linkset procedure.
- Add a new linkset to the database with the necessary signaling links and the linkset type B, C, or D.
  1. Perform the Adding an SS7 Linkset procedure to add the linkset.
  2. If the necessary signaling links are not in the database, perform the Adding an SS7 Signaling Link procedure to add the signaling links to the database.

Canceling the RTRV-LS, RTRV-DSTN, and RTRV-RTE Commands

Because the rtrv-ls, rtrv-dstn, and rtrv-rte commands used in this procedure can output information for a long period of time, the rtrv-ls, rtrv-dstn, and rtrv-rte commands can be canceled and the output to the terminal stopped. There are three ways that the rtrv-ls, rtrv-dstn, and rtrv-rte commands can be canceled.

- Press the F9 function key on the keyboard at the terminal where the rtrv-ls, rtrv-dstn, or rtrv-rte commands were entered.
- Enter the canc-cmd without the trm parameter at the terminal where the rtrv-ls, rtrv-dstn, or rtrv-rte commands were entered.
- Enter the canc-cmd:trm=<xx>, where <xx> is the terminal where the rtrv-ls, rtrv-dstn, or rtrv-rte commands were entered, from another terminal other that the terminal where the rtrv-ls, rtrv-dstn, or rtrv-rte commands were entered. To

enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands Manual*.

1. Display the current route configuration using the `rtrv-rte` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24     LSN         RC     APCA
   140-012-004    1-111-1    10-13-12-1     ls000001    10
240-012-002
                                            ls000002    10
240-012-002
                                            ls000003    20
240-012-002
                                            ls000004    30
240-012-002
                                            ls000005    40
240-012-002
                                            ls000006    50
240-012-002
                                                RTX:No  CLLI=dp1
   140-012-005 1-111-2 10-13-12-2           ls000001    10
240-012-002
                                            ls000002    10
240-012-002
                                            ls000003    20
240-012-002
                                            ls000004    30
240-012-002
                                            ls000005    40
240-012-002
                                            ls000006    50
240-012-002
                                                RTX:No  CLLI=dp2
   DPCI       ALIASN/N24       ALIASA       LSN         RC     APC
   2-234-5    11-13-3-3       240-111-111   ls100001    10     1-234-5
                                            ls100002    10     1-234-6
                                            ls100003    20     1-234-7
                                            ls100004    30     1-234-1
                                            ls100005    40     1-234-2
                                            ls100006    50     1-234-3
                                                RTX:No  CLLI=idp1
   DPCN             ALIASA         ALIASI   LSN         RC     APC
   12-12-13-3       011-222-111    0-001-1  ls200001    10
10-13-9-3
                                            ls200002    10
10-13-10-0
```

```
                                                ls200003    20     10-13-10-1
                                                ls200004    30     10-13-10-2
                                                ls200005    40     10-13-10-3
                                                ls200006    50     10-13-11-0
                                                    RTX:No  CLLI=ndp1
   DPCN24           ALIASA          ALIASI    LSN         RC     APC
```

If the cluster point code of the route being added in this procedure is not shown in the `rtrv-rte` output, perform the Adding a Cluster Point Code procedure and add the cluster point code. Continue the procedure with 3.

If the cluster point code of the route being added in this procedure is shown in the `rtrv-rte` output, continue the procedure with 2.

2. Display the `ncai` parameter value assigned to the cluster point code using the `rtrv-dstn` command and specifying the cluster point code. If the `ncai` parameter value is `no`, then the route to the DPC must be the same as the route to the cluster point code. If the `ncai` parameter value is `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code. The `ncai` value is shown in the `NCAI` field of the `rtrv-dstn` output. For this example, enter this command.

   `rtrv-dstn:dpca=111-011-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI          ALIASN/N24    DMN

   111-011-*      rlghncbb000 yes yes ----------      --------------   SS7

   SPCA          NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   -----------   yes          none   off   none     no     no    none

Destination table is (12 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

3. Verify that the required linkset for the route is in the database by displaying the linksets in the database with the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                   L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2          001-207-000    none 1    1    no  B    6    off off off no
off
ls1305        000-005-000    none 1    1    no  A    1    off off off no
off
ls1307        000-007-000    none 1    1    no  A    1    off off off no
off
lsn7          002-002-002    none 1    1    no  C    8    off off off no
```

```
off
e1m1s1         001-001-001   none 1    1    no   A    7     off off off
no     off
e1m1s2         001-001-002   none 1    1    no   A    7     off off off
no     off

                                  L3T SLT             GWS GWS GWS
LSN            APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i          1-207-0       none 1    1    no   B    4     off off off
---    on
ls1315         0-015-0       none 1    1    no   A    1     off off off
---    off
ls1317         0-017-0       none 1    1    no   A    1     off off off
---    on
ls7890         7-089-0       none 1    2    no   B    1     off off off
---    off
e1m2s1         1-011-1       none 1    1    no   A    7     off off off
---    off
e1m2s2         1-011-2       none 1    1    no   A    7     off off off
---    off

Link set table is (12 of 1024) 1% full.
```

The route containing a cluster point code can have only linksets with the linkset types B, C, or D assigned to it. If the required linkset is not in the database, perform the Adding an SS7 Linkset procedure to add the linkset to the database with the `ipgwapc=no` parameter value and with the linkset types B, C, or D. The APC of the linkset cannot be a private point code. Continue the procedure with 5.

If the linkset that will be added to the route is shown in the `rtrv-ls` output and is a B-, C-, or D-type linkset, continue the procedure with 4.

4. Display each linkset being assigned to the route to verify the `ipgwapc` parameter values with the `rtrv-ls` command, specifying the name of the linkset that will be assigned to the route.

   The `ipgwapc` linkset parameter value is `yes`, the DPC of the route cannot be a cluster point code. The `ipgwapc` value is shown in the `IPGWAPC` field of the `rtrv-ls` output.

   If the linkset displayed in this step contains the `ipgwapc=yes` parameter, repeat this step with another linkset shown in 3. If all the linksets have been displayed, and the `ipgwapc` value for all the linksets is `yes`, add the desired linkset by performing the Adding an SS7 Linkset procedure with the `ipgwapc=no` parameter value and with the linkset types B, C, or D. The **APC** of the linkset cannot be a private point code.

   For this example, enter the following command.

   `rtrv-ls:lsn=lsn7`

   This is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0
```

```
                                L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn7          002-002-002   none 1   1   no  C   8    off off off no
off

           CLLI         TFATCABMLQ MTPRSE ASL8
           -----------  4          ---    no

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

                                 L2T                PCR  PCR
           LOC  PORT SLC TYPE     SET  BPS    ECM   N1   N2
           1211 A      0  LIMDS0   1    56000  BASIC ---  -----
           1211 B      1  LIMDS0   1    56000  BASIC ---  -----
           1211 A1     2  LIMDS0   1    56000  BASIC ---  -----
           1211 A2     3  LIMDS0   1    56000  BASIC ---  -----
           1211 B2     4  LIMDS0   1    56000  BASIC ---  -----
           1211 B1     5  LIMDS0   1    56000  BASIC ---  -----
           1211 B3     6  LIMDS0   1    56000  BASIC ---  -----
           1211 A3     7  LIMDS0   1    56000  BASIC ---  -----

Link set table is (12 of 1024) 1% full.
```

5. For a routeset to have more than two routes with the same relative cost value, the 6-Way Loadsharing on Routesets feature must be enabled and turned on.

   To verify the status of the 6-Way Loadsharing on Routesets feature, enter this command.

   `rtrv-ctrl-feat:partnum=893019801`

   The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, perform Activating the 6-Way Loadsharing on Routesets Feature to enable and turn on the 6-Way Loadsharing on Routesets feature.

After the 6-Way Loadsharing on Routesets feature has been enabled and turned on, or if the `rtrv-ctrl-feat` output shows that the 6-Way Loadsharing on Routesets feature is enabled and turned on, continue this procedure with 6.

6. Add the route using the `ent-rte` command specifying the cluster point code as the DPC of the route.

   For this example, enter this command.

   `ent-rte:dpca=111-011-*:lsn=lsn7:rc=10`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
ENT-RTE: MASP A - COMPLTD
```

7. Verify the changes using the `rtrv-rte` command, specifying the destination point code of the route.

   For this example, enter these commands.

   `rtrv-rte:dpca=111-011-*`

   This is an example of the possible output.

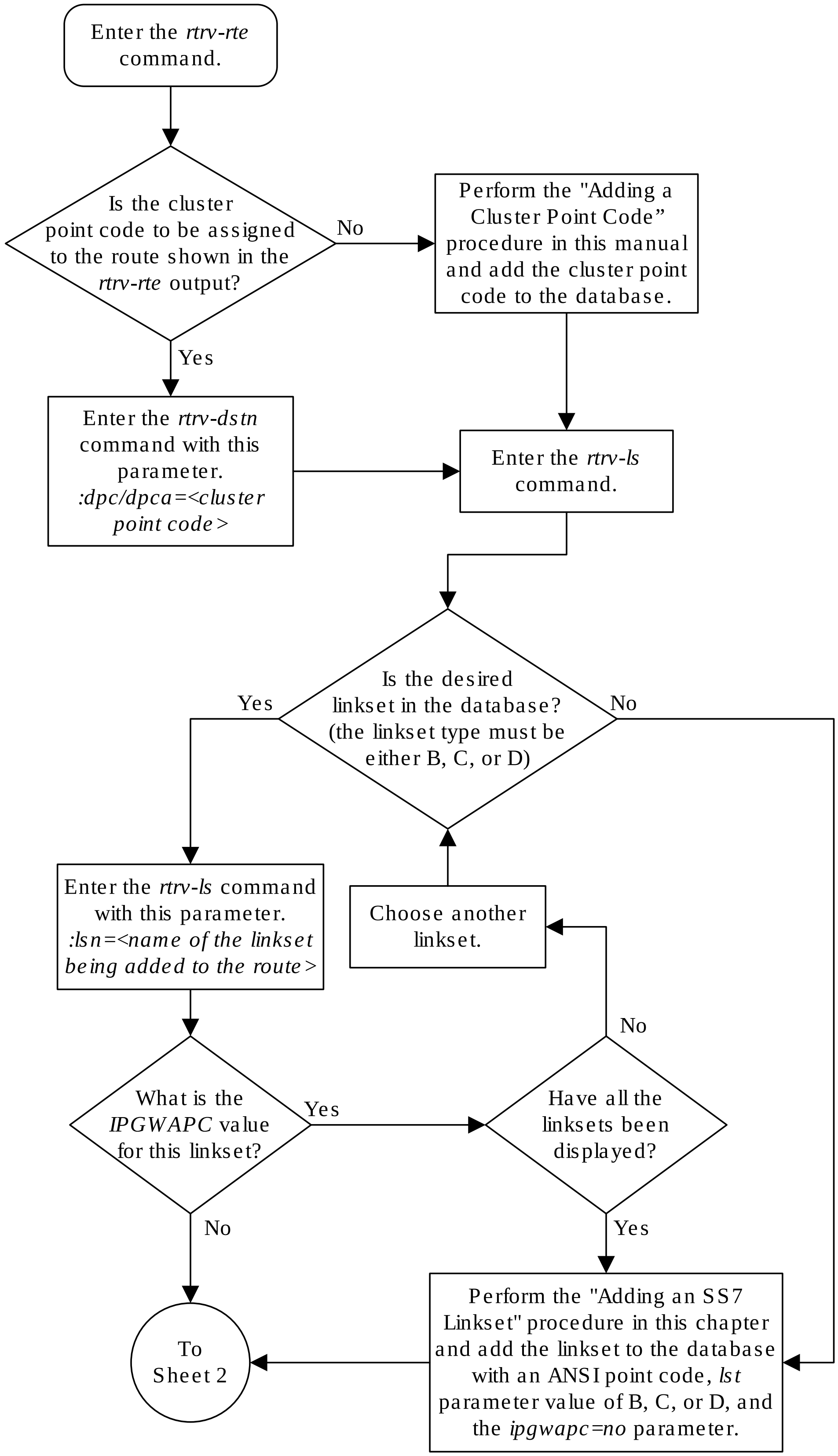
```
rlghncxa03w 09-05-07 11:43:04 GMT  EAGLE5 41.0.0

   DPCA              ALIASI           ALIASN/N24    RTX   CLLI
                                   LSN             RC    APCA
111-011-*     --------------   --------------   No    -----------
                                   lsn7            10    002-002-002
```

8. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

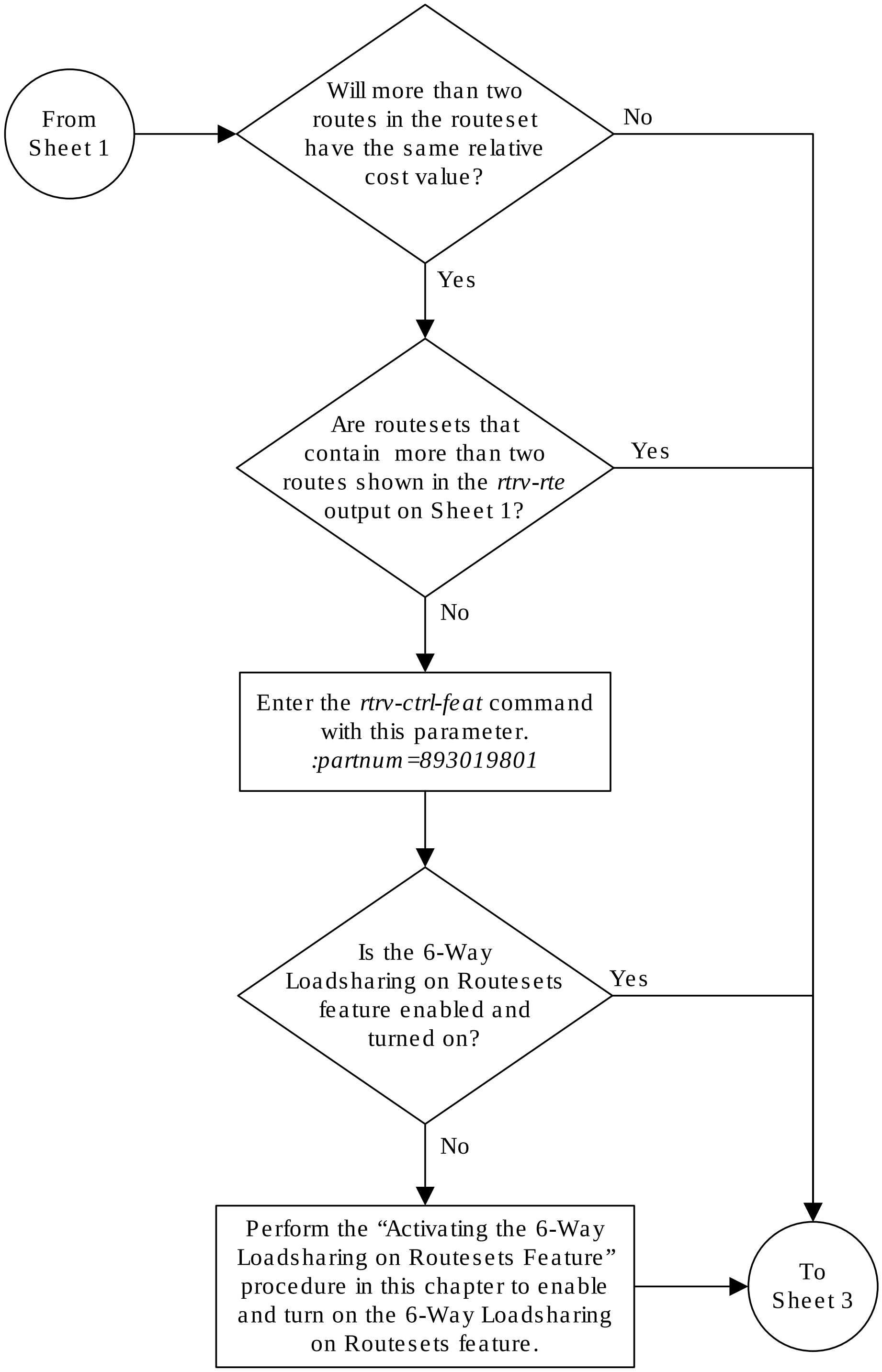
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

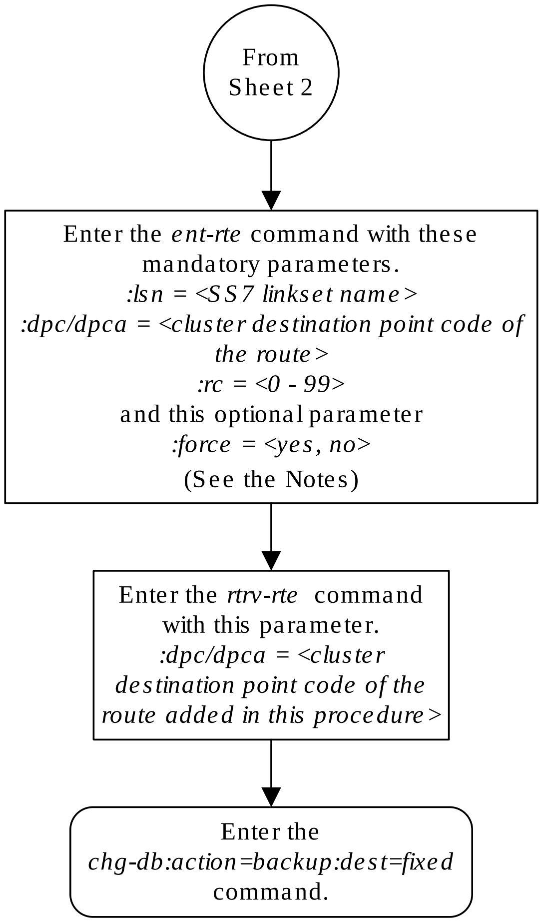
Figure 3-19 Adding a Route Containing a Cluster Point Code



Sheet 1 of 3


From
Sheet 1
Will more than two
routes in the routeset
have the same relative
cost value?
No
Yes
Are routesets that
contain more than two
routes shown in the rtrv-rte
output on Sheet 1?
Yes
No
Enter the rtrv-ctrl-feat command
with this parameter.
:partnum=893019801
Is the 6-Way
Loadsharing on Routesets
feature enabled and
turned on?
Yes
No
Perform the "Activating the 6-Way
Loadsharing on Routesets Feature"
procedure in this chapter to enable
and turn on the 6-Way Loadsharing
on Routesets feature.
To
Sheet 3

Sheet 2 of 3



Notes:

1. The *force=yes* parameter must be specified if the linkset being assigned to the route has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

2. A route can contain a maximum of six linksets.

3. A maximum of two linksets can be assigned the same *rc* parameter value, if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six linksets in the route can have the same *rc* parameter value.

4. If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (*ncai* parameter of either the *ent-dstn* or *chg-dstn* command) is set to no, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code.

5. Private point codes can be specified as the DPC of a route only if the linkset assigned to the route is an IPGWx linkset (a linkset that has the *ipgwapc=yes* parameter assigned to it).

Sheet 3 of 3

3.22 Adding a Route Containing an IPGWx Linkset

This procedure is used to add a route to the database containing an **IPGWx** linkset using the `ent-rte` command. Routes that do not contain IPGWx linksets are configured in these procedures.

- Adding a Route Containing an SS7 DPC
- Adding a Route Containing a Cluster Point Code

The `ent-rte` command uses these parameters.

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code of the node that the traffic is being sent to.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes.

`:lsn` – The name of the linkset that will carry the traffic to the node specified by the destination point code.

`:rc` – The relative cost (priority) for this route.

`:force` – This parameter allows a route to be added to the database even if the linkset to be assigned to the route does not have any signaling links in it.

These items must be configured in the database before a route can be added:

- Destination point code (DPC) – see Adding a Destination Point Code. The DPC of the route can be a private point code, but does not have to be.
- Linkset – see the “Configuring an IPGWx Linkset” procedure in *Database Administration - IP7 User's Guide*.
- Link – see the “Adding an IPGWx Signaling Link” procedure in *Database Administration - IP7 User's Guide*.

The linkset assigned to this route must have an adjacent point code (APC) in the SS7 domain and must contain the `ipgwapc=yes` parameter value. The domain of the DPC is shown in the `DMN` field in the output of the `rtrv-dstn` command. The `ipgwapc` parameter value is shown in the output of the `rtrv-ls:lsn=<linkset name>` command.

The DPC of the route must be the APC of the linkset, or the **SAPC** assigned to the linkset. The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, a routes containing ANSI DPC must have a linkset with an ANSI APC; a route containing an ITU-I DPC must have a linkset with an ITU-I APC; a route containing a 14-bit ITU-N DPC must have a linkset with a 14-bit ITU-N APC; a route containing a 24-bit ITU-N DPC must have a linkset with a 24-bit ITU-N APC. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Cluster point codes, network routing point codes, alias point codes, and secondary point codes cannot be used. True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields. The DPC of the route cannot be a proxy point code. A proxy point code or secondary point code cannot be assigned to the DPC of the route. A secondary point code cannot be assigned to the linkset.

For a linkset with an ITU APC, if that linkset has an SAPC assigned to it, the SAPC of that linkset can be specified as the DPC of the route. The format of the SAPC can be different from the APC of the linkset. For example, an IPGWx linkset has an ITU-I APC and an ITU-N SAPC is assigned to the linkset. The DPC of the route can be either the ITU-I APC of the linkset or the ITU-N SAPC assigned to the linkset.

The DPC of the route is the destination point code to be reached by the route and is shown in the output of the `rtrv-rte` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields.

The `APCA`, `APCI`, `APCN`, and `APCN24` fields in the output of the `rtrv-rte` command show the point code of the node that is directly adjacent to the node in the route.

The route containing an IPGWx linkset can contain only one linkset.

The `force=yes` parameter must be specified if the specified linkset has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to no, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code. For more information, see the Nested Cluster Routing section.

For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the `MULTGC` value set to `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `MULTGC` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.

Canceling the `RTRV-LS`, `RTRV-DSTN`, and `RTRV-RTE` Commands

Because the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls`, `rtrv-dstn`, and `rtrv-rte` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered, from another terminal other that the terminal where the `rtrv-ls`, `rtrv-dstn`, or `rtrv-rte` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current route configuration using the `rtrv-rte` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24    LSN         RC    APCA
   140-012-004    1-111-1    10-13-12-1    ls000001    10
240-012-002
                                           ls000002    10
240-012-002
                                           ls000003    20
240-012-002
                                           ls000004    30
240-012-002
                                           ls000005    40
240-012-002
                                           ls000006    50
240-012-002
                                               RTX:No   CLLI=dp1
   140-012-005 1-111-2 10-13-12-2          ls000001    10
240-012-002
                                           ls000002    10
240-012-002
                                           ls000003    20
240-012-002
                                           ls000004    30
240-012-002
                                           ls000005    40
240-012-002
                                           ls000006    50
240-012-002
                                               RTX:No   CLLI=dp2
 p-004-004-004 ----------    11-12-10-3    ---------- --
-----------
                                               RTX:No
CLLI=-----------
   DPCI       ALIASN/N24       ALIASA      LSN         RC    APC
   2-234-5    11-13-3-3       240-111-111  ls100001    10    1-234-5
                                           ls100002    10    1-234-6
                                           ls100003    20    1-234-7
                                           ls100004    30    1-234-1
                                           ls100005    40    1-234-2
                                           ls100006    50    1-234-3
                                               RTX:No   CLLI=idp1
   DPCN              ALIASA         ALIASI  LSN         RC    APC
   12-12-13-3        011-222-111    0-001-1 ls200001    10
10-13-9-3
                                           ls200002    10
10-13-10-0
                                           ls200003    20
10-13-10-1
```

```
                                                 ls200004    30     10-13-10-2
                                                 ls200005    40     10-13-10-3
                                                 ls200006    50     10-13-11-0
                                                    RTX:No   CLLI=ndp1
   DPCN24              ALIASA           ALIASI   LSN         RC     APC
```

If the destination point code of the route being added in this procedure is not shown in the `rtrv-rte` output, perform the Adding a Destination Point Code procedure and add the destination point code of the route to the destination point code table. This point code can be a private point code, but does not have to be a private point code. The DPC of the route cannot be a proxy point code. A proxy point code or secondary point code cannot be assigned to the DPC of the route. After the point code is added, continue the procedure with 3.

If the point code that will be assigned to the route is shown in the `rtrv-rte` output, but has a route assigned to it, that point code cannot be used as the DPC of the route being added in this procedure. Choose another point code and repeat this step.

If the `RC`, `LSN`, and `APC` columns in the `rtrv-rte` output contain dashes for the given point code, a route is not assigned to the point code.

If the point code that will be assigned to the route is shown in the `rtrv-rte` output, but does not have a route assigned to it, continue the procedure with 2.

> **Note:**
>
> If cluster point codes are not shown in 1, or if the DPC of the route being added is not a member of the cluster point code, continue the procedure with 4.

2. Enter the `rtrv-dstn` command with the DPC of the route. For this example, enter this command.

   `rtrv-dstn:dpca=004-004-004`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   004-004-004    ----------- no  --- ----------      --------------    SS7

   PPCA          NCAI  PRX      RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
   010-010-010   ----  no       none    off   none      no      no    none

Destination table is (14 of 2000) 1% full
Alias table is (0 of 12000) 0% full
PPC table is (2 of 10) 20% full
```

The DPC of the route cannot be a proxy point code. A proxy point code or secondary point code cannot be assigned to the DPC of the route. If any of these conditions are shown in the rtrv-dstn output, either choose another point code shown in 1 and repeat this procedure, or perform the Adding a Destination Point Code procedure and add the destination point code of the route to the destination point code table. This point code can be a private point code, but does not have to be a private point code. The DPC of the route cannot be a proxy point code. A proxy point code or secondary point code cannot be assigned to the DPC of the route.

> **Note:**
>
> If cluster point codes are not shown in 1, or if the DPC of the route being added is not a member of the cluster point code, continue the procedure with 4.

3. Display the `ncai` parameter value assigned to the cluster point code using the `rtrv-dstn` command and specifying the cluster point code.

   If the `ncai` parameter value is `no`, then the route to the DPC must be the same as the route to the cluster point code. If the `ncai` parameter value is `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code. The `ncai` value is shown in the `NCAI` field of the `rtrv-dstn` output. For this example, enter this command.

   `rtrv-dstn:dpca=111-011-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA           CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   111-011-*      rlghncbb000 yes yes ----------
--------------    SS7

   SPCA          NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------    yes          none    off   none      no      no     none

Destination table is (12 of 2000) 1% full
Alias table is (18 of 8000) 1% full
```

   If the `ncai` parameter value of the cluster point code is `no`, and you wish to change the `ncai` parameter value to `yes`, perform the Changing the Attributes of a Cluster Point Code procedure. If the `ncai` parameter value of the cluster point code is `no`, and you do not wish to change the `ncai` parameter value to `yes`, add a new DPC for the route by performing the Adding a Destination Point Code procedure. The DPC of the route cannot be a proxy point code. A proxy point code or secondary point code cannot be assigned to the DPC of the route.

4. Verify that the required linkset for the route is in the database by displaying the linksets in the database with the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
```

```
SLSCI NIS
e1e2          001-207-000   none 1   1   no  B   6    off off off no
off
ls1305        000-005-000   none 1   1   no  A   1    off off off no
off
ls1307        000-007-000   none 1   1   no  A   1    off off off no
off
lsn4        p-004-004-004   none 1   1   no  A   6    off off off no
off
e1m1s1        001-001-001   none 1   1   no  A   7    off off off no
off
e1m1s2        001-001-002   none 1   1   no  A   7    off off off no
off

                                 L3T SLT             GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0        none 1   1   no  B   4    off off off ---   on
ls1315        0-015-0        none 1   1   no  A   1    off off off ---
off
ls1317        0-017-0        none 1   1   no  A   1    off off off ---   on
e1m2s1        1-011-1        none 1   1   no  A   7    off off off ---
off
e1m2s2        1-011-2        none 1   1   no  A   7    off off off ---
off

Link set table is (11 of 1024) 1% full.
```

If the point code chosen in 1 is not shown as the APC of a linkset, perform the “Configuring an IPGWx Linkset” procedure in *Database Administration - IP7 User's Guide* and add the IPGWx linkset to the database. After the IPGWx linkset has been added, continue the procedure with 7.

If the point code chosen in 1 is shown as the APC of a linkset, continue the procedure with 5.

5. Display each linkset being assigned to the route to verify the `multgc` and `ipgwapc` parameter values with the `rtrv-ls` command, specifying the name of the linkset that will be assigned to the route.

   If the `multgc` linkset parameter value is `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `multgc` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route. The `multgc` value is shown in the `MULTGC` field of the `rtrv-ls` output.

   If the `ipgwapc` parameter value for the linkset is `yes`, continue the procedure with 6.

   If the `ipgwapc` parameter value for the linkset is `no`, the linkset and point code cannot be assigned to the route. Either select another point code and repeat this procedure from 1, or add the desired linkset by perform the “Configuring an IPGWx Linkset” procedure in the *Database Administration Manual - IP[7] Secure Gateway* and add the IPGWx linkset to the database. After the **IPGWx** linkset has been added, continue the procedure with 7.

   For this example, enter the following commands.

   ```
   rtrv-ls:lsn=lsn4
   ```

This is an example of the possible output.

```
rlghncxa03w 06-10-11 11:06:27 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn4         p-004-004-004   none 1   1   no  A    6    off off off
no    off

           CLLI         TFATCABMLQ MTPRSE ASL8
           -----------  3          no     no

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           yes     ---------- 100   100     % 80       % CdPA

           LOC  PORT SLC TYPE
           1107 A      0  SS7IPGW
           1205 A      1  SS7IPGW
           1305 A      2  SS7IPGW
           1303 A      3  SS7IPGW
           1307 A      4  SS7IPGW
           1311 A      5  SS7IPGW


Link set table is (16 of 1024) 1% full.
```

6. Only one linkset can be assigned to a route containing an IPGWx linkset.

   Verify that the linkset that will be assigned to the route is not assigned to any existing routes. Enter the `rtrv-rte` command with the name of the linkset that you wish to assign to the route. For this example, enter this command.

   `rtrv-rte:lsn=lsn4`

   If the linkset is not assigned to a route, no entries are displayed in the `rtrv-rte` output as shown in the following output example.

```
rlghncxa03w 06-10-11 11:06:27 GMT EAGLE5 36.0.0
LSN           DPC           RC
```

   If the linkset is assigned to a route, add the desired linkset by perform the “Configuring an IPGWx Linkset” procedure in *Database Administration - IP7 User's Guide* and add the IPGWx linkset to the database. After the **IPGWx** linkset has been added, continue the procedure with 7.

   If the linkset is not assigned to a route, continue the procedure with 7.

7. Add the route using the `ent-rte` command with the **IPGWx** linkset.

   These are the rules that apply to adding a route.

   - The `force=yes` parameter must be specified if the linkset being assigned to the route has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.

- A route can contain only one linkset.
- If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to `no`, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code.
- For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the `MULTGC` value set to `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `MULTGC` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.
- The DPC of the route must be the APC of the linkset, or the SAPC assigned to the linkset. The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, a route containing an ANSI DPC must have a linkset with an ANSI APC; a route containing an ITU-I DPC must have a linkset with an ITU-I APC; a route containing a 14-bit ITU-N DPC must have a linkset with a 14-bit ITU-N APC; a route containing a 24-bit ITU-N DPC must have a linkset with a 24-bit ITU-N APC. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Cluster point codes, network routing point codes, alias point codes, secondary point codes, and proxy point codes cannot be used. True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields. For a linkset with an ITU APC, if that linkset has an SAPC assigned to it, the DPC of the route can be either the APC of the linkset or the SAPC assigned to the linkset. The format of the SAPC can be different from the APC of the linkset. For a linkset with an ITU APC, if that linkset does not have an SAPC assigned to it, the DPC of the route must be the APC of the linkset.
- Private point codes can be specified as the DPC of a route only if the linkset assigned to the route is an IPGWx linkset (a linkset that has the `ipgwapc=yes` parameter assigned to it).

```
ent-rte:dpca=p-004-004-004:lsn=lsn4:rc=10
```

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
ENT-RTE: MASP A - COMPLTD
```

8. Verify the changes using the `rtrv-rte` command, specifying the destination point code of the route.

   For this example, enter this command.

   ```
   rtrv-rte:dpca=p-004-004-004
   ```

   This is an example of the possible output.

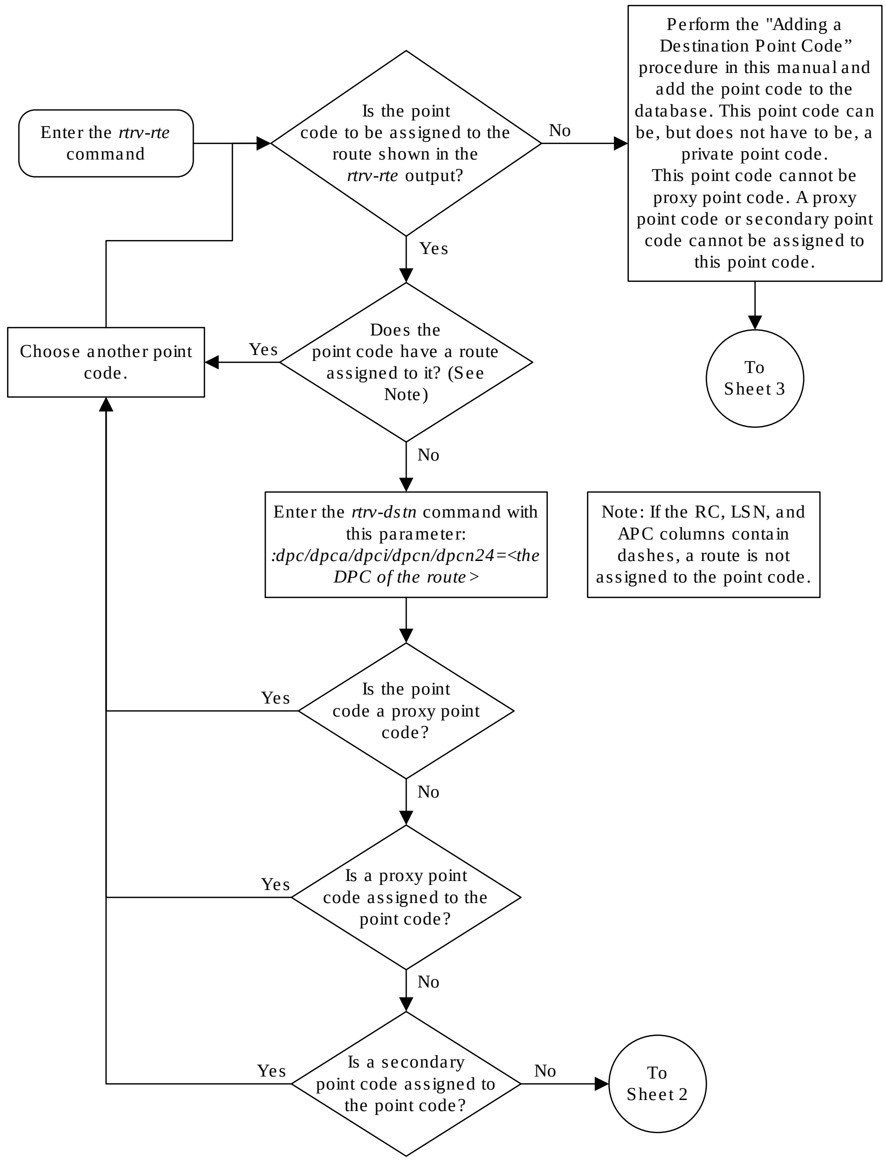
   ```
   rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
     DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   p-004-004-004 ----------    11-12-10-3    lsn4       10  p-004-004-004
                                                     RTX:No  CLLI=-----------
   ```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

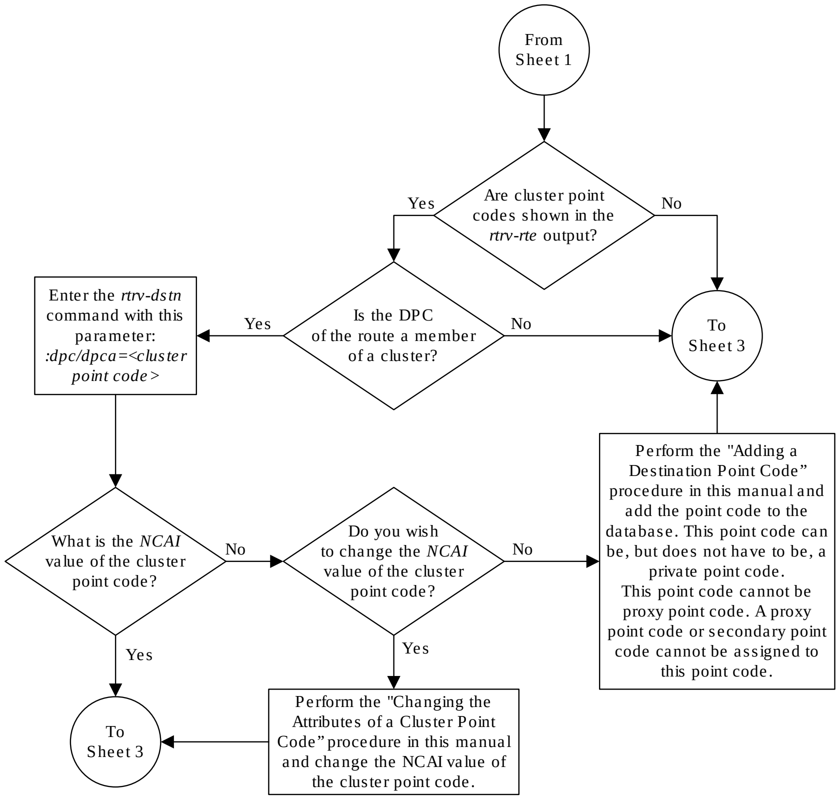
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

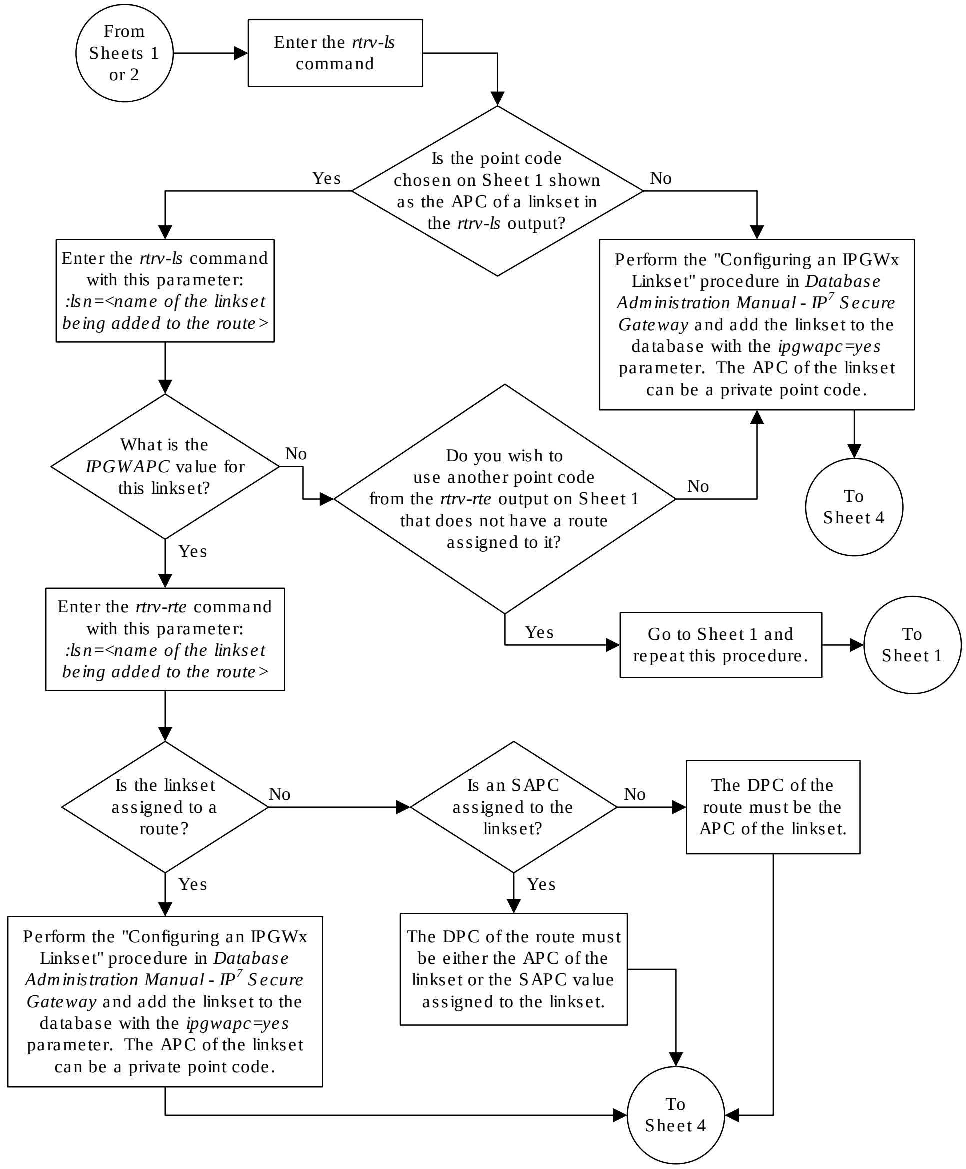
Figure 3-20 Adding a Route Containing an IPGWx Linkset



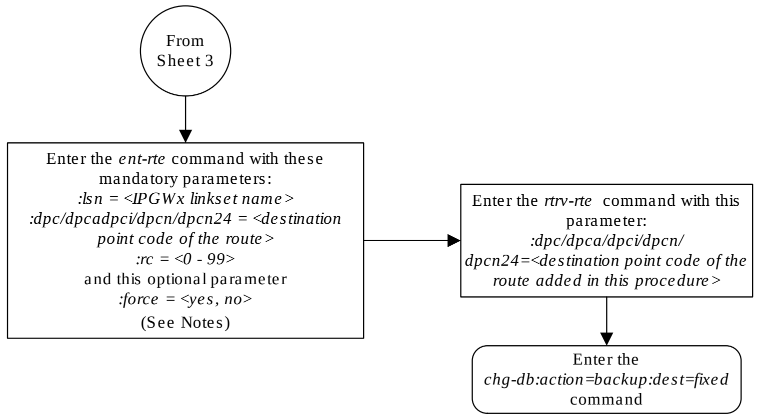
Sheet 1 of 4


From Sheet 1
Are cluster point codes shown in the rtrv-rte output?
Yes
No
Is the DPC of the route a member of a cluster?
Yes
No
To Sheet 3
Enter the rtrv-dstn command with this parameter: :dpc/dpca=<cluster point code>
What is the NCAI value of the cluster point code?
No
Do you wish to change the NCAI value of the cluster point code?
No
Perform the "Adding a Destination Point Code" procedure in this manual and add the point code to the database. This point code can be, but does not have to be, a private point code. This point code cannot be proxy point code. A proxy point code or secondary point code cannot be assigned to this point code.
Yes
Yes
To Sheet 3
Perform the "Changing the Attributes of a Cluster Point Code" procedure in this manual and change the NCAI value of the cluster point code.

Sheet 2 of 4


From Sheets 1 or 2
Enter the rtrv-ls command
Is the point code chosen on Sheet 1 shown as the APC of a linkset in the rtrv-ls output?
Yes
No
Enter the rtrv-ls command with this parameter: :lsn=<name of the linkset being added to the route>
Perform the "Configuring an IPGWx Linkset" procedure in Database Administration Manual - IP7 Secure Gateway and add the linkset to the database with the ipgwapc=yes parameter. The APC of the linkset can be a private point code.
What is the IPGWAPC value for this linkset?
No
Do you wish to use another point code from the rtrv-rte output on Sheet 1 that does not have a route assigned to it?
No
To Sheet 4
Yes
Enter the rtrv-rte command with this parameter: :lsn=<name of the linkset being added to the route>
Yes
Go to Sheet 1 and repeat this procedure.
To Sheet 1
Is the linkset assigned to a route?
No
Is an SAPC assigned to the linkset?
No
The DPC of the route must be the APC of the linkset.
Yes
Yes
Perform the "Configuring an IPGWx Linkset" procedure in Database Administration Manual - IP7 Secure Gateway and add the linkset to the database with the ipgwapc=yes parameter. The APC of the linkset can be a private point code.
The DPC of the route must be either the APC of the linkset or the SAPC value assigned to the linkset.
To Sheet 4

Sheet 3 of 4



Notes:

1. The *force=yes* parameter must be specified if the linkset being assigned to the route has no signaling links assigned to it. Otherwise, each linkset must have at least one signaling link assigned to it.
2. A route can contain only one linkset.
3. If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (*ncai* parameter of either the *ent-dstn* or *chg-dstn* command) is set to no, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code.
4. For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the MULTGC value set to yes, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the MULTGC value is set to no, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route.
5. The DPC of the route must be the APC of the linkset, or the SAPC assigned to the linkset. The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, a route containing an ANSI DPC must have a linkset with an ANSI APC; a route containing an ITU-I DPC must have a linkset with an ITU-I APC; a route containing a 14-bit ITU-N DPC must have a linkset with a 14-bit ITU-N APC; a route containing a 24-bit ITU-N DPC must have a linkset with a 24-bit ITU-N APC.

   The DPC of the route must be defined as a true point code in the *rtrv-dstn* output. Cluster point codes, network routing point codes, alias point codes, secondary point codes, and proxy point codes cannot be used. True point codes are shown in the output of the *rtrv-dstn* command in the *DPCA*, *DPCI*, *DPCN*, or *DPCN24* fields.

   For a linkset with an ITU APC, if that linkset has an SAPC assigned to it, the DPC of the route can be either the APC of the linkset or the SAPC assigned to the linkset. The format of the SAPC can be different from the APC of the linkset.

   For a linkset with an ITU APC, if that linkset does not have an SAPC assigned to it, the DPC of the route must be the APC of the linkset.
6. Private point codes can be specified as the DPC of a route only if the linkset assigned to the route is an IPGWx linkset (a linkset that has the *ipgwapc=yes* parameter assigned to it).

Sheet 4 of 4

3.23 Removing a Route

This procedure is used to remove a route from the database using the `dlt-rte` command.

The `dlt-rte` command uses these parameters.

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code of the node shown in the `rtrv-rte` output.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes.

`:lsn` – The name of the linkset that carries the traffic bound for the node specified by the destination point code.

`:all` – Are all routes associated with the **DPC** to be removed

The route to be removed must exist in the database. This can be verified in 1.

The last route to a DPC cannot be removed if it is reference by a mated application or concerned signaling point code group. If this condition exists, the command to remove the route from the database is rejected. Before removing the last route to a DPC from the database, enter the `rtrv-cspc` and `rtrv-map` commands to verify if the DPC to the route being removed from the database is referenced by either mated applications or concerned signaling point code groups. If `rtrv-cspc` command output shows a reference to the DPC of the route being removed by this procedure (in the `PCA`, `PCI`, `PCN`, or `PCN24` fields), perform the "Removing Concerned Signaling Point Codes" procedure in *Database Administration – GTT User's Guide*. If the `rtrv-map` command output shows a reference to the DPC of the route being removed by this procedure (shown in the `PCA`, `PCI`, `PCN`, or `PCN24` fields), perform the "Removing a Mated Application" procedure in *Database Administration – GTT User's Guide*.

The last route to a DPC cannot be removed if it is referenced by a route exception table entry. Use the `rtrv-rtx` command with the DPC value to display the route exception entries that reference the DPC of the route being removed. If route exception table entries reference the DPC of the route being removed, perform the Removing a Route Exception Entry procedure to remove the route exception table entries that reference the DPC of the route being removed.

The last route to a DPCdestination (**Route** DPC) cannot be removed if that route is referenced by the gateway screening redirect function's DPC parameter. Use the `rtrv-gws-redirect` command to verify the DPC used for the gateway screening redirect function. If the gateway screening redirect function is referencing the destination of the route to be removed from the database, change the gateway screening redirect function's DPC with the "Changing the Gateway Screening Redirect Parameters" procedures in *Database Administration – Features User's Guide*. The gateway screening redirect function can also be disabled by using the "Disabling the Gateway Screening Redirect Function" procedure in *Database Administration – Features User's Guide*.

The last route to a DPC cannot be removed if is referenced in the `rtrv-pct` output as either a `REALPC` or `FILTPC` value. Perform the Removing a Point Code and CIC Translation Entry procedure to remove the point code and CIC entries that reference the DPC of the route.

Either the `lsn` or `all=yes` parameters must be specified with the `dlt-rte` command. If the `all=no` parameter is specified, the `lsn` parameter must be specified. If the `lsn` parameter is specified, the linkset must be defined in the database as a route to the specified route DPC. The linkset name is shown in the `LSN` field of the `rtrv-rte` command output.

The route assigned to a full point code DPC cannot be removed from the database if that DPC is a member of a cluster point code in the database if the network cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to no. If the nested cluster allowed indicator is set to yes, the route to the full point code DPC that is a member of a cluster point code can be removed from the database, but the route to the cluster point code will not be removed from the database, even if the cluster point code and the full point code are assigned to the same route. When the route to the member of the cluster point code is removed from the database, the member of the cluster point code assumes all the attributes of the cluster point code and will use the same routes that are assigned to the cluster point code.

If a route assigned to a cluster point code is removed from the database, all routes to any members of that cluster are also removed from the database if the network cluster allowed indicator is set to no. If the nested cluster allowed indicator is set to yes, the route to the cluster point code can be removed from the database, but any routes to any point codes that are members of the cluster point code remain in the database, even if the cluster point code and its members are assigned to the same route. For more information, refer to the Nested Cluster Routing section.

The destination point code of the route being removed from the database cannot be in the mated relay node (**MRN**) table. Verify this by entering the `rtrv-mrn` command, specifying the destination point code of the route being removed from the database. If the destination point code of the route is shown in the `rtrv-mrn` command output, remove the point code from the MRN table, by performing the "Removing an MRN Group or MRN Group Entry" procedure in *Database Administration – GTT User's Guide*.

The destination point code of the route being removed from the database cannot be referenced by a global title translation entry shown in the `rtrv-gtt` or `rtrv-gta` outputs. Verify this by entering the `rtrv-gtt` or `rtrv-gta` command, specifying the destination point code of the route being removed from the database. If the destination point code of the route is shown in the `rtrv-gtt` output, remove the global title translation entry by performing the "Removing a Global Title Translation" procedure in *Database Administration – GTT User's Guide*. If the destination point code of the route is shown in the `rtrv-gta` output, remove the global title translation entry by performing the "Removing Global Title Address Information" procedure in *Database Administration – GTT User's Guide*.

The destination point code of the route being removed from the database cannot be shown in the `rtrv-ppsopts` output. Verify this by entering the `rtrv-ppsopts` command. Any references to the destination point code the `rtrv-ppsopts` output are removed in 12.

If the APC of the linkset assigned to the route being removed is the same as the DPC of the route, this route cannot be removed if a proxy point code is assigned to the DPC of the route, and the linkset assigned to this route contains these attributes:

- The LST=PRX parameter value
- The proxy point code that is assigned to the DPC of the route is also assigned to the linkset.

If the DPC of the route contains a proxy point code and the linkset contains the value `PRX` for the linkset type (`LST`) and the proxy point code value assigned to the route DPC, and there are other routes assigned to this DPC, the other routes to this DPC must be removed before this route can be removed with the `dlt-rte` command.

The examples in this procedure are used to remove all routes to DPC `003-003-003` from the database.

Canceling the `RTRV-RTE` Command

Because the `rtrv-rte` command used in this procedure can output information for a long period of time, the `rtrv-rte` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-rte` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-rte` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-rte` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-rte` command was entered, from another terminal other that the terminal where the `rtrv-rte` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current route configuration using the `rtrv-rte` command. This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA            ALIASI     ALIASN/N24    LSN        RC    APCA
   001-002-003 --------- --------------    ls04       10    001-002-003
                                               RTX:No  CLLI=ls04clli
   002-002-100 --------- --------------    ls01       10    002-002-100
                                           ls02       20    004-004-004
                                           ls03       30    003-003-003
                                               RTX:No  CLLI=ls01clli
   002-007-008 --------- --------------    ls06       10    002-007-008
                                               RTX:No  CLLI=ls06clli
   002-009-003 ---------- --------------   ls05       10    002-009-003
                                               RTX:No  CLLI=-----------
   003-003-003 --------- --------------    ls03       10    003-003-003
                                           ls01       20    002-002-100
                                           ls02       30    004-004-004
                                               RTX:No  CLLI=ls03clli
   004-004-004 --------- --------------    ls02       10    004-004-004
                                           ls01       20    002-002-100
                                           ls03       30    003-003-003
                                               RTX:No  CLLI=ls02clli
   009-002-003 ---------- --------------   ls07       10    009-002-003
                                               RTX:No  CLLI=-----------
   140-012-004    1-111-1      11121       ls000001   10    240-012-002
                                           ls000002   10    240-012-003
                                           ls000003   20    240-012-004
                                           ls000004   30    240-012-005
                                           ls000005   40    240-012-006
                                           ls000006   50    240-012-007
                                               RTX:No  CLLI=dp1
   140-012-005 1-111-2       11122         ls000001   10    240-012-002
```

```
                                              ls000002   10
240-012-003
                                              ls000003   20
240-012-004
                                              ls000004   30
240-012-005
                                              ls000005   40
240-012-006
                                              ls000006   50
240-012-007
                                                  RTX:No   CLLI=dp2
   179-100-087 ---------- --------------   atmansi0   10
179-100-087
                                                  RTX:No
CLLI=-----------
   200-050-176 ---------- --------------   atmansi1   10
200-050-176
                                                  RTX:No
CLLI=-----------

   DPCI        ALIASN/N24       ALIASA      LSN        RC     APC
   2-234-5     11-13-3-3       240-111-111  ls100001   10     1-234-5
                                            ls100002   10     1-234-6
                                            ls100003   20     1-234-7
                                            ls100004   30     1-234-1
                                            ls100005   40     1-234-2
                                            ls100006   50     1-234-3
                                                RTX:No   CLLI=idp1
   3-150-4 -------------   --------------  lsi7       10     3-150-4
                                                RTX:No   CLLI=lsi7clli

   DPCN              ALIASA          ALIASI  LSN        RC     APC
   10685      ------------- ---------        lsn5       10     10685
                                                RTX:No   CLLI=lsi5clli
   13111         011-222-111 0-001-1         ls200001   10     11111
                                             ls200002   10     11112
                                             ls200003   20     11113
                                             ls200004   30     11114
                                             ls200005   40     11115
                                             ls200006   50     11116
                                                RTX:No   CLLI=ndp1

   DPCN24            ALIASA          ALIASI  LSN        RC     APC
```

2. Verify that the **GTT** feature is on, by entering the `rtrv-feat` command. If the GTT feature is on, the `GTT` field should be set to `on`.

> **Note:**
>
> The`rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the`rtrv-feat` command description in *Commands User's Guide*.

If the GTT feature is off, continue the procedure with 13.

If the GTT feature is on, continue the procedure with 3.

3. Display the mated applications in the database, using the `rtrv-map` command and the DPC of the route being removed from the database. For this example, enter this command.

   `rtrv-map:pca=003-003-003`

   This is an example of the possible output.

```
rlghncxa03w 09-07-25 09:42:31  GMT  EAGLE5 41.1.0

PCA           Mate PCA      SSN RC MULT SRM MRC GRP NAME SSO
003-003-003                 252 10  SOL *N  *N  GRP01    OFF

MAP TABLE IS (5 of 1024) 1 % FULL
```

   If the DPC of the route is shown in the `rtrv-map` command output (in the `PCA`, `PCI`, `PCN`, `PCN24`, `MPCA`, `MPCI`, `MCPN`, or `MPCN24` fields), perform the " Removing a Mated Application" procedure in *Database Administration – GTT User's Guide*, to remove the remove the point code from the mated application that references the DPC of the route.

4. Display the group names in the database using the `rtrv-cspc` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 00:27:31 GMT EAGLE5 36.0.0
CSPC GRP   NETWORK                PERCENT FULL
GRP01      ANSI                     3%
GRP02      ITU-I                   81%
GRP03      ITU-N                   54%
GRP04      ANSI                    42%
GRP05      ANSI                    15%
GRP10      ANSI                    15%
GRP15      ANSI                    15%
```

5. Display the point codes in the **CSPC** group shown in 4, in the `GRP NAME` field, using the `rtrv-cspc` command with the CSPC group name whose point codes are the same network type as the DPC of the route being removed.

   Repeat this step until all CSPC groups with the same network type as the DPC of the route have been displayed. For this example, enter this command.

   `rtrv-cspc:grp=grp01`

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 00:28:31 GMT EAGLE5 36.0.0
CSPC GRP      PC            TYPE
GRP01         003-003-003   A
              009-009-009   A
```

If the DPC of the route is in the CSPC group, perform the "Removing Concerned Signaling Point Codes" procedure in *Database Administration – GTT User's Guide* to remove the point code from the CSPC group that references the DPC of the route.

6. Display the status of the Intermediate GTT **Load Sharing** (**IGTTLS**) controlled feature by entering this command.

   `rtrv-ctrl-feat:partnum=893006901`

   The following is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
INTERMED GTT LOAD SHARING 893006901  off     ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the IGTTLS feature is not enabled, continue the procedure with 8.

   If the IGTTLS feature is enabled, continue the procedure with 7.

7. Display the mated relay node (MRN) groups in the database, using the `rtrv-mrn` command, specifying the destination point code of the route that is being removed from the database. For this example, enter this command.

   `rtrv-mrn:pca=003-003-003`

   This is an example of the possible output.

```
rlghncxa03w 10-07-07 00:34:31 GMT EAGLE5 42.0.0

     PC             RC
     003-003-003    10
     008-001-001    20
     240-012-007    30
     008-001-003    40
     008-001-004    50
     008-001-005    60
     008-001-006    70
     008-001-007    80
     008-001-008    90
```

```
MRN table is (39 of 3000) 1% full.
```

If the DPC of the route is not shown in the `rtrv-mrn` output in this step, continue the procedure with 8.

If the DPC of the route is shown in the `rtrv-mrn` output in this step, perform the "Removing an MRN Group or MRN Group Entry" procedure in *Database Administration – GTT User's Guide*, and remove the remove the point code from the MRN group that references the DPC of the route. After the point code has been removed from the MRN group, continue the procedure with 8.

8. Display the translation types in the database using the `rtrv-tt` command.

   This is an example of the possible output.

```
rlghncxa03w 10-07-25 09:42:31 GMT  EAGLE5 42.0.0
TYPEA       TTN         NDGT
1           lidb        5
2           c800        10
3           d700        6
5           scp1        6
10          scp2        6
15          scp3        3

ALIAS       TYPEA
30          5
40          10
50          3
65          3

TYPEI       TTN         NDGT
105         itudb       8

ALIAS       TYPEI
7           105

TYPEN       TTN         NDGT
120         dbitu       7

ALIAS       TYPEN
8           120
```

9. Display the global title translations in the database using the `rtrv-gtt` command specifying a translation type from the `rtrv-tt` command output shown in 8, and the DPC of the route from the database.

   For this example, enter this command.

   `rtrv-gtt:typea=10:pca=003-003-003`

   This is an example of the possible output.

```
rlghncxa03w 10-07-25 09:43:31 GMT  EAGLE5 42.0.0
TYPEA   TTN         NDGT
```

```
10     scp2       6

GTT TABLE IS  10 % FULL    (27000 of 269999)

START GTA              END GTA                XLAT   RI     PC
615370                 615380                 DPCSSN SSN
003-003-003
     MAPSET=6      SSN=254 NGT=---

Command Retrieved 1 Entries
```

Repeat this step for each translation type shown in 8.

If the `rtrv-gtt` output shows any entries, perform the "Removing a Global Title Translation" procedure in *Database Administration – GTT User's Guide* to remove the entries shown in this step.

If the `rtrv-gtt` output shows no entries or the "Removing a Global Title Translation" procedure was performed, continue the procedure with 10.

10. Display the GTT sets in the database using the `rtrv-gttset` command.

    This is an example of the possible output.

```
rlghncxa03w 10-07-07 00:27:31 GMT EAGLE5 42.0.0
GTTSN     NETDOM  NDGT
lidb      ansi    10
t800      ansi    10
si000     itu     15
imsi      itu     15
abcd1234  itu     12

GTT-SET table is (5 of 2000) 1% full.
```

11. Display the global title address (**GTA**) information for a GTT set from 10.

    Use the `rtrv-gta` command with the `gttsn` parameter value shown in 10, and with the DPC of the route that is being removed from the database. For this example, enter this command.

    `rtrv-gta:gttsn=t800:pca=003-003-003`

    This is an example of the possible output.

```
rlghncxa03w 10-07-07 00:27:31 GMT EAGLE5 42.0.0
GTTSN     NETDOM  NDGT
t800      ansi    10
GTA TABLE IS   1 % FULL  (17 of 269999)

START GTA  END GTA    XLAT   RI     PC
3365840000 3365849999 dpc    ssn    003-003-003
     MAPSET=6     SSN=0   CCGT=no  NTT=---

Command Retrieved 1 Entries
```

Repeat this step for each GTT set name type shown in 10.

If the `rtrv-gta` output shows any entries, perform the "Removing Global Title Address Information" procedure in *Database Administration – GTT User's Guide* to remove the entries shown in this step.

If the `rtrv-gta` output shows no entries or the "Removing Global Title Address Information" procedure was performed, continue the procedure with 12.

12. Enter the `rtrv-ppsopts` command to verify that the DPC of the route is not shown in the `rtrv-ppsopts` output. This is an example of the possible output.

```
rlghncxa03w 10-07-20 09:07:58 GMT  EAGLE5 42.0.0
Prepaid SMS Options
-------------------
BPARTYCHK     = OFF
PPT       PCA/PCI/PCN                  SSN       RI        Set ID
---       --------------------         ----      ---       ------
1         PCI:     1-001-1             25        SSN       DFLT
2         --------------------         NONE      GT        DFLT
3         --------------------         NONE      GT        DFLT
4         PCI:     003-003-003         30        GT        1
5         --------------------         NONE      GT        DFLT
6         --------------------         NONE      GT        DFLT
7         --------------------         NONE      GT        DFLT
8         PCI:     1-001-1             75        SSN       1
9         --------------------         NONE      GT        DFLT
10        --------------------         NONE      GT        DFLT
11        --------------------         NONE      GT        DFLT
12        --------------------         NONE      GT        DFLT
13        --------------------         NONE      GT        DFLT
14        --------------------         NONE      GT        DFLT
15        --------------------         NONE      GT        DFLT
16        --------------------         NONE      GT        DFLT
17        --------------------         NONE      GT        DFLT
18        --------------------         NONE      GT        DFLT
19        --------------------         NONE      GT        DFLT
20        --------------------         NONE      GT        DFLT
21        --------------------         NONE      GT        DFLT
22        --------------------         NONE      GT        DFLT
23        --------------------         NONE      GT        DFLT
24        --------------------         NONE      GT        DFLT
25        --------------------         NONE      GT        DFLT
26        --------------------         NONE      GT        DFLT
27        --------------------         NONE      GT        DFLT
28        --------------------         NONE      GT        DFLT
29        --------------------         NONE      GT        DFLT
30        --------------------         NONE      GT        DFLT
31        --------------------         NONE      GT        DFLT
32        --------------------         NONE      GT        DFLT

GTA
---
NONE
NONE
```

```
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
NONE
```

> **Note:**
>
> If the Flexible GTT Load Sharing feature is not enabled, the Set ID column is not displayed in the`rtrv-ppsopts` output.

If the `rtrv-ppsopts` output shows any entries that reference the DPC of the route, remove the reference using the `chg-ppsopts` command with the prepaid portability type (the `PPT` value) that contains the reference and either the `pci=none` or `pcn=none` parameters (depending on the type of point code the prepaid portability type contains).

`chg-ppsopts:ppt=4:pci=none`

This is an example of the possible output.

```
rlghncxa03w 07-05-20 09:07:58 GMT  EAGLE5 37.0.0
CHG-PPSOPTS: MASP A - COMPLTD
```

Repeat this step for other entries shown in the `rtrv-ppsopts` output that reference the DPC of the route.

13. Verify whether or not the DPC of the route is referenced by the gateway screening redirect function by entering the `rtrv-gws-redirect` command.

    The following is an example of the possible output.

```
rlghncxa03w 09-05-07 00:17:31 GMT EAGLE5 41.0.0
ENABLED     DPCA           RI    SSN  TT    GTA
on          003-003-003    GT    15   225   9105551212
```

    If the DPC of the route is shown in the DPC field, perform the "Changing the Gateway Screening Redirect Parameters" procedure in *Database Administration – Features User's Guide* to change the gateway screening redirect function's DPC.

14. If the APC of the linkset assigned to the route being removed is the same as the DPC of the route, this route cannot be removed if a proxy point code is assigned to the DPC of the route, and the linkset assigned to this route contains these attributes.

    - The LST=PRX parameter value
    - The proxy point code that is assigned to the DPC of the route is also assigned to the linkset.

    A quantity of proxy point codes must be enabled for a proxy point code to be assigned to the DPC of the route and to the linkset, and for the linkset type to be PRX (LST=PRX). Enter this command to verify whether or not a proxy point code quantity is enabled.

    `rtrv-ctrl-feat:partnum=893018701`

    The following is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Proxy Point Code          893018701  on      20

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

    If a proxy point code quantity is not enabled, continue the procedure by performing one of these steps.

    - If the route that is being removed is not the last route to the DPC, continue the procedure by performing one of these steps.
      – If the DPC of the route is not an ANSI point code, continue the procedure with one of these steps.
        * Perform 19 if the `RTX` value of the route, shown in 1 is `yes`.

        * Perform 21if the RTX value of the route is no.
    - If the DPC of the route is an ANSI point code, continue the procedure with 18.
- If the route that is being removed is the last route to the DPC, continue the procedure with 17.

If a proxy point code quantity is enabled, continue the procedure with 15.

15. Verify if a proxy point code is assigned to the DPC of the route. Enter the `rtrv-dstn` command with the DPC of the route. For this example, enter this command.

    `rtrv-dstn:dpca=003-003-003`

    The following is an example of the possible output.

```
rlghncxa03w 10-12-14 09:13:33 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   003-003-003   rlghncbb334 no  ---    1-112-3
10-13-10-1   SS7

   PPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   010-010-010  ---- no      none   off   none     no     no    none

Destination table is (13 of 2000) 1% full
Alias table is (0 of 12000) 0% full
PPC table is (2 of 10) 20% full
```

    If a proxy point code is not assigned to the DPC of the route, continue the procedure by performing one of these steps.

    - If the route that is being removed is not the last route to the DPC, continue the procedure by performing one of these steps.
        - If the DPC of the route is not an ANSI point code, continue the procedure with one of these steps.
            * Perform 19 if the RTX value of the route, shown in 1 is yes.
            * Perform 21if the RTX value of the route is no.
        - If the DPC of the route is an ANSI point code, continue the procedure with 18.
    - If the route that is being removed is the last route to the DPC, continue the procedure with 17.

    If a proxy point code is assigned to the DPC of the route, continue the procedure with 16.

16. Verify the attributes of the linkset assigned to the route being removed by entering the `rtrv-ls` command with the name of the linkset. For this example, enter this command.

    `rtrv-ls:lsn=ls03`

The following is an example of the possible output.

```
rlghncxa03w 07-08-14 09:24:36 EST  37.0.0

                                    L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls03          003-003-003    none 1   1   no  PRX 0    off off off no
off

              PPCA           CLLI         TFATCABMLQ MTPRSE ASL8
              010-010-010    -----------  1          ---    no

           IPGWAPC MATELSN    IPTPS  LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ----   ---      ---       CdPA

Link set table is (9 of 1024) 1% full.
```

If the linkset contains the value PRX for the linkset type (LST) and the proxy point code value shown in 15, the other routes to this DPC must be removed before this route can be removed in 21.

Whether or not the linkset contains the PRX linkset type and the proxy point code value shown in 15, continue the procedure by performing one of these steps.

- If the route that is being removed is not the last route to the DPC, continue the procedure by performing one of these steps.
  - If the DPC of the route is not an ANSI point code, continue the procedure with one of these steps.
    - Perform 19 if the `RTX` value of the route, shown in 1 is `yes`.
    - Perform 21 if the `RTX` value of the route is `no`.
  - If the DPC of the route is an ANSI point code, continue the procedure with 18.
- If the route that is being removed is the last route to the DPC, continue the procedure with 17.

17. Display the PCT (point code and CIC translation) entries by entering the `rtrv-pct` command.

    This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA             FILTPCA          REALPCA      SI  SSN  RELCAUSE
    001-001-001      *                002-002-002   5  ---   10

    ECICS = 10          ECICE = 20
    RCICS = 30          RCICE = 40

    001-001-001      *                003-003-003   5  ---   20

    ECICS = 70          ECICE = 80
    RCICS = 90          RCICE = 90
```

```
    006-006-006      003-003-003      020-020-020   3  200  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    007-007-007      009-009-009      008-008-008   3  135  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    007-007-007      010-010-010      008-008-008   5  ---   50

    ECICS = 200         ECICE = 224
    RCICS = 300         RCICE = 324

    EPCI             FILTPCI          REALPCI      SI  SSN  RELCAUSE
    1-001-2          2-002-2          2-002-2       3   10  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    EPCN             FILTPCN          REALPCN      SI  SSN  RELCAUSE
    00300            *                00200         *  ---  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------


Unique EPC    is 4 of 250
Unique RealPC is 5 of 250

PCT table is (6 of 1000) 1% full.
```

If the DPC of the route is shown in the `rtrv-pct` output, perform the Removing a Point Code and CIC Translation Entry procedure to remove the PCT entries whose REALPC or FILTPC values are the DPC of the route.

If the DPC of the route is not shown in the `rtrv-pct` output, or the Removing a Point Code and CIC Translation Entry procedure was performed, continue the procedure by performing one of these steps.

- If the DPC of the route is not an ANSI point code, continue the procedure with one of these steps.
  - Perform 19 if the `RTX` value of the route, shown in 1 is `yes`.
  - Perform 21 if the `RTX` value of the route is `no`.
- If the DPC of the route is an ANSI point code, continue the procedure with 18.

18. Verify whether or not the DPC of the route is a member of a cluster point code by entering the `rtrv-rte` command with these parameters and values.
    - The `dpca` parameter containing the network and cluster values of the DPC of the route.
    - Three asterisks (***) for the network-cluster member value of the point code.

- The `mode=full` parameter.

For this example, enter this command.

`rtrv-rte:dpca=003-003-***:mode=full`

This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:00:32 GMT  EAGLE5 43.0.0

DPCA              ALIASI            ALIASN/N24     RTX    CLLI
                                    LSN            RC     APCA
003-003-*      --------------    --------------   No     -----------
                                    ls1            1      002-002-002
                                    ls2            2      003-003-003
003-003-003       1-112-3           10-13-10-1     Yes    -----------
                                    ls1            1      002-002-002
                                    ls2            2      003-003-003

                  OPCA
                  011-011-011       ls3            1      004-004-004

003-003-200       1-117-3           10-13-11-1     Yes    -----------
                                    ls1            1      002-002-002
                                    ls2            2      003-003-003

                  OPCA
                  010-010-010       ls3            1      004-004-004

003-003-225    --------------    --------------   Yes    -----------
                                    ls1            1      002-002-002
                                    ls2            2      003-003-003
```

If the DPC of the route is not a member of a cluster point code, continue the procedure by performing one of these steps.

- Perform 19 if the RTX value of the route, shown in `RTX` field of the `rtrv-rte` output in 1, is `yes` and the last route to the DPC of the route is being removed.
- Perform 21 if these either of these conditions are present.
  - The RTX value of the route is `no`.
  - The RTX value of the route is `yes` and the last route to the DPC is not being removed.

If the DPC of the route is a member of a cluster point code, continue the procedure with 20.

19. Display the route exception table entries referencing the DPC of the route by entering the `rtrv-rtx` command with the DPC of the route being removed in this procedure. For this example, enter this command.

    `rtrv-rtx:dpca=003-003-003`

```
rlghncxa03w 10-12-07 00:34:31 GMT EAGLE5 43.0.0
```

```
   DPCA          RTX-CRITERIA                LSN        RC    APC

   003-003-003   OPCA
                 007-007-007                 ls01       1
002-002-100

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   40
    EXCEPTION DPC(s):               1
    TOTAL DPC(s):                  41
    CAPACITY (% FULL):              1%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

If the DPC of the route being removed in this procedure is shown in the `rtrv-rtx` output, perform the Removing a Route Exception Entry procedure to remove all the route exception table entries shown in this step. After the exception routes have been removed, continue the procedure with 21.

20. Display the attributes of the cluster point code by entering the `rtrv-dstn` command with the cluster point code value shown in 18. For this example, enter this command.

    `rtrv-dstn:dpca=003-003-*`

    This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24     DMN
   003-003-*     rlghncbb333 yes no    ----------
--------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------  no           none    off   none     no     no     none

Destination table is (11 of 2000) 1% full
Alias table is (6 of 8000) 1% full
```

To remove all the routes to the cluster point code and all the routes to the members of the cluster point code (shown in 18) with the `all=yes` parameter of the `dlt-rte` command, the `NCAI` value of the cluster point code must be `no`. Perform the Changing the Attributes of a Cluster Point Code procedure to change the `NCAI` value of the cluster point code to `no` if required. The `RTX=yes` value in the `rtrv-rte` output shows that exception routes reference the DPC of the route. To remove the routes to the members of the cluster point code, the exception routes that reference the DPC of the routes must be removed. Perform the Removing a Route Exception Entry procedure to remove the exception routes shown in the `rtrv-rte` output in 18. After the `NCAI` value has been verified and changed in necessary, and any exception routes have been removed if necessary, continue the procedure with 21 specifying the cluster point code that was specified in this step and with the `all=yes` parameter.

To remove all the routes to the cluster point code and without removing all the routes to the members of the cluster point code (shown in 18) with the `all=yes` parameter of the `dlt-rte` command, the `NCAI` value of the cluster point code must be `yes`. Perform the Changing the Attributes of a Cluster Point Code procedure to change the `NCAI` value of the cluster point code to `yes` if required. After the `NCAI` value has been verified and changed in necessary, continue the procedure with 21 specifying the cluster point code that was specified in this step and with the `all=yes` parameter.

To remove a single route to the cluster point code or a route to a member of the cluster point code (shown in 18) with the `lsn` parameter of the `dlt-rte` command, the `NCAI` value of the cluster point code must be `yes`. Perform the Changing the Attributes of a Cluster Point Code procedure to change the `NCAI` value of the cluster point code to `yes` if required. The `RTX=yes` value in the `rtrv-rte` output shows that exception routes reference the DPC of the route. To remove the last route to the member of the cluster point code, the exception routes that reference the DPC of the route must be removed. Perform the Removing a Route Exception Entry procedure to remove the exception routes shown in the `rtrv-rte` output in 18. After the `NCAI` value has been verified and changed in necessary, and any exception routes have been removed if necessary, continue the procedure with 21 specifying the DPC of the route and with the `lsn` parameter.

21. Remove the routes from the database using the `dlt-rte` command. For this example, enter this command.

    `dlt-rte:dpca=003-003-003:all=yes`

    A specific route to a DPC can be removed from the database. To do this, specify the `lsn` parameter instead of the `all` parameter and the linkset name of the route you wish to remove. For this example, enter this command.

    `dlt-rte:dpca=003-003-003:lsn=ls03`

    If the linkset contains the value `PRX` for the linkset type (`LST`) (shown in 16) and the proxy point code value shown in 15, the other routes to this DPC must be removed before this route can be removed in this step. For this example, enter the `dlt-rte` command with the `lsn` parameter to remove the linksets ls01 and ls02 from route DPC 003-003-003, before removing linkset ls03. For this example, enter these commands.

    `dlt-rte:dpca=003-003-003:lsn=ls01`

    `dlt-rte:dpca=003-003-003:lsn=ls02`

    `dlt-rte:dpca=003-003-003:lsn=ls03`

    If the `NCAI` field value in 20 is no, and was not changed, enter the `dlt-rte` command specifying the cluster point code as the value of the `dpca` parameter. For this example, enter this command.

    `dlt-rte:dpca=003-003-*:all=yes`

    When either of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:45:54 GMT  EAGLE5 36.0.0
DLT-RTE: MASP A - COMPLTD
```

22. Verify the changes using the `rtrv-rte` command, specifying the destination point code of the route. For this example, enter this command.

    `rtrv-rte:dpc=003-003-003`

    If all routes to the DPC were removed in 21, this is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   003-003-003 ---------- --------------   ---------- -- -----------
                                               RTX:No   CLLI=ls03clli
```

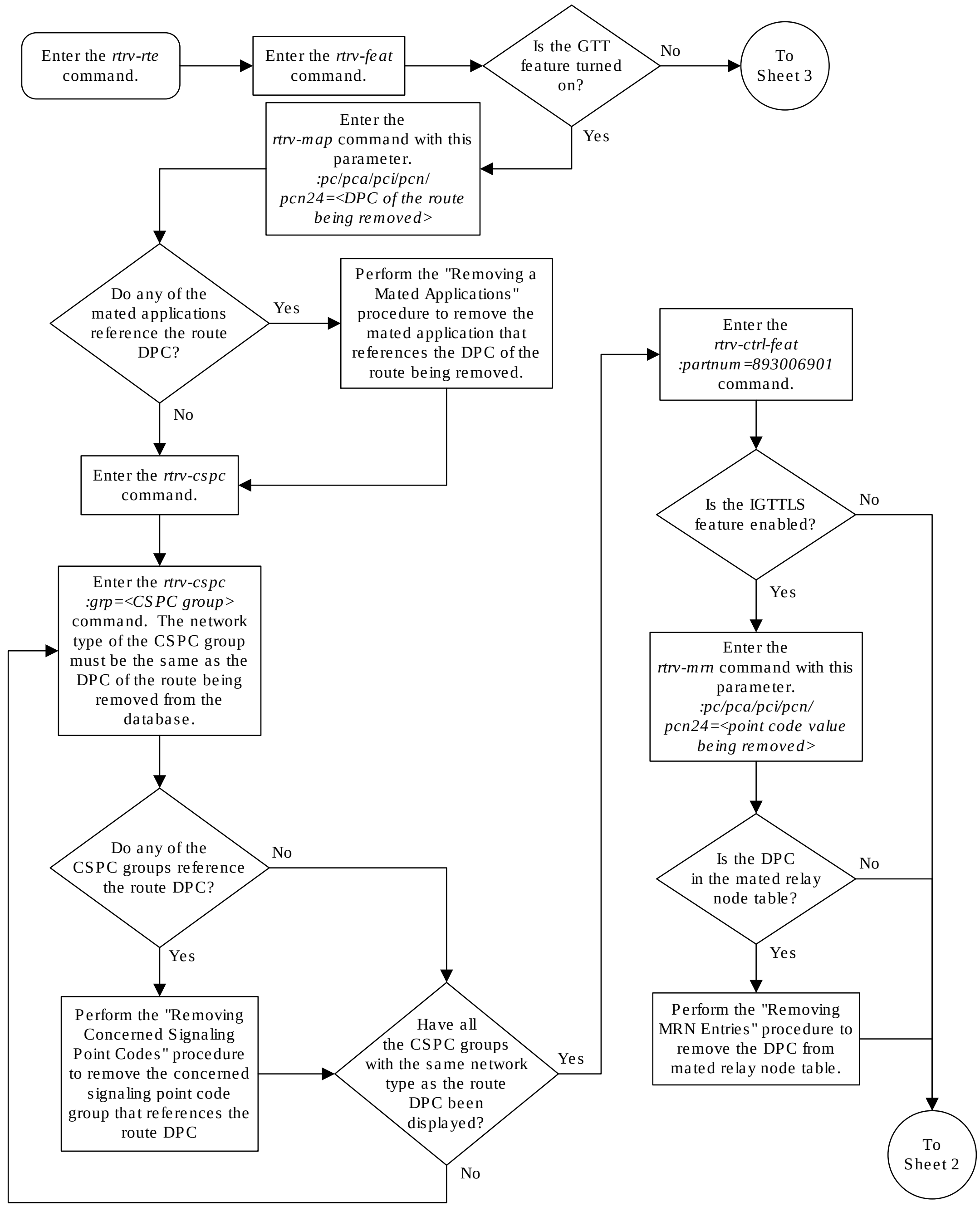
    If a specific route to the DPC was removed in 21, this is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   003-003-003 ----------- -----------     ls01       20
002-002-002
                                           ls02       30
004-004-004
                                               RTX:No   CLLI=ls03clli
```

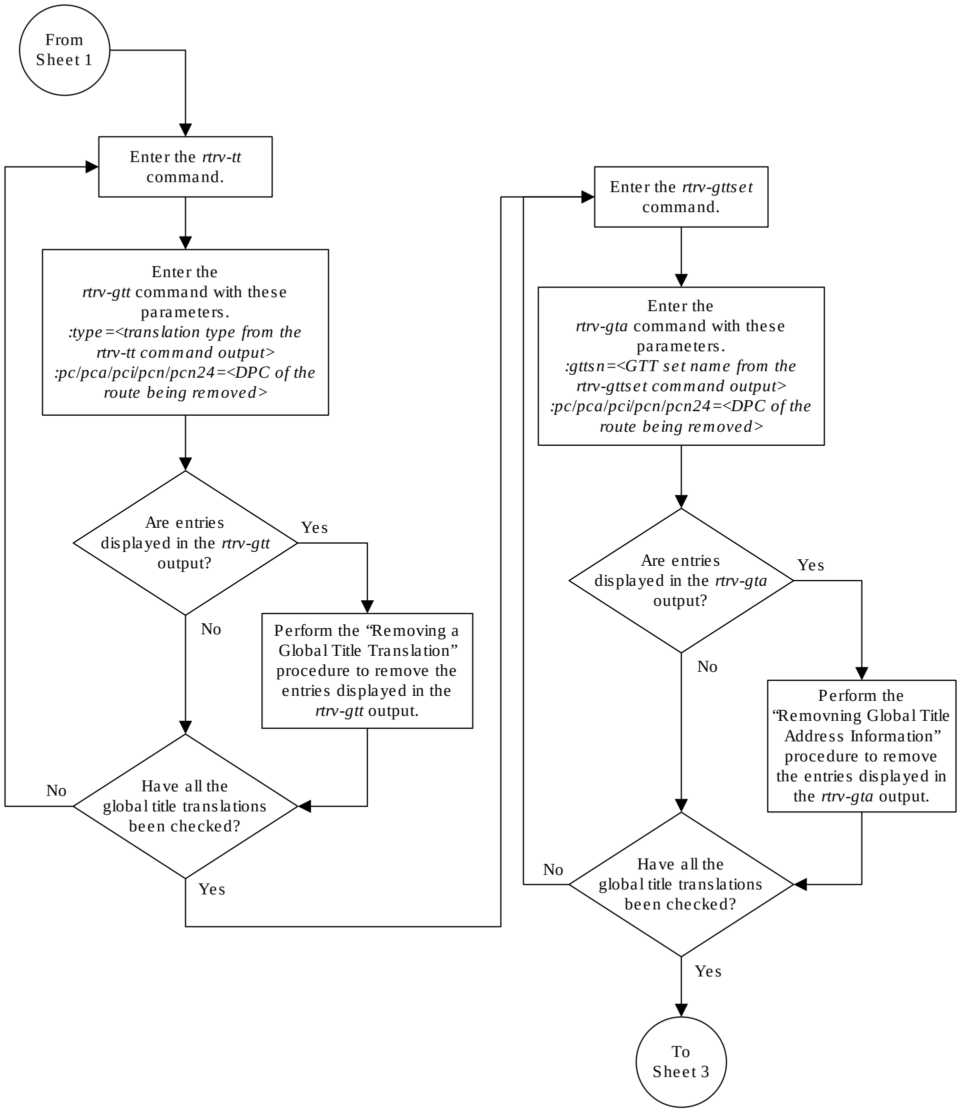
23. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

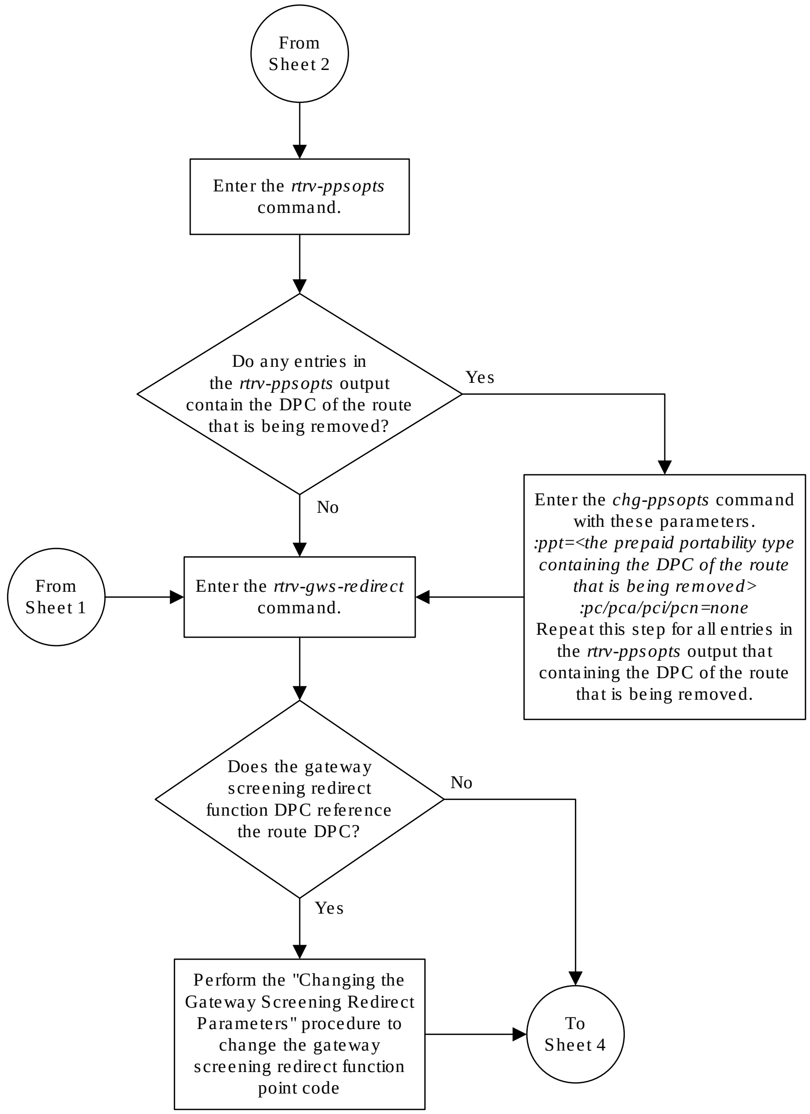
Figure 3-21 Removing a Route



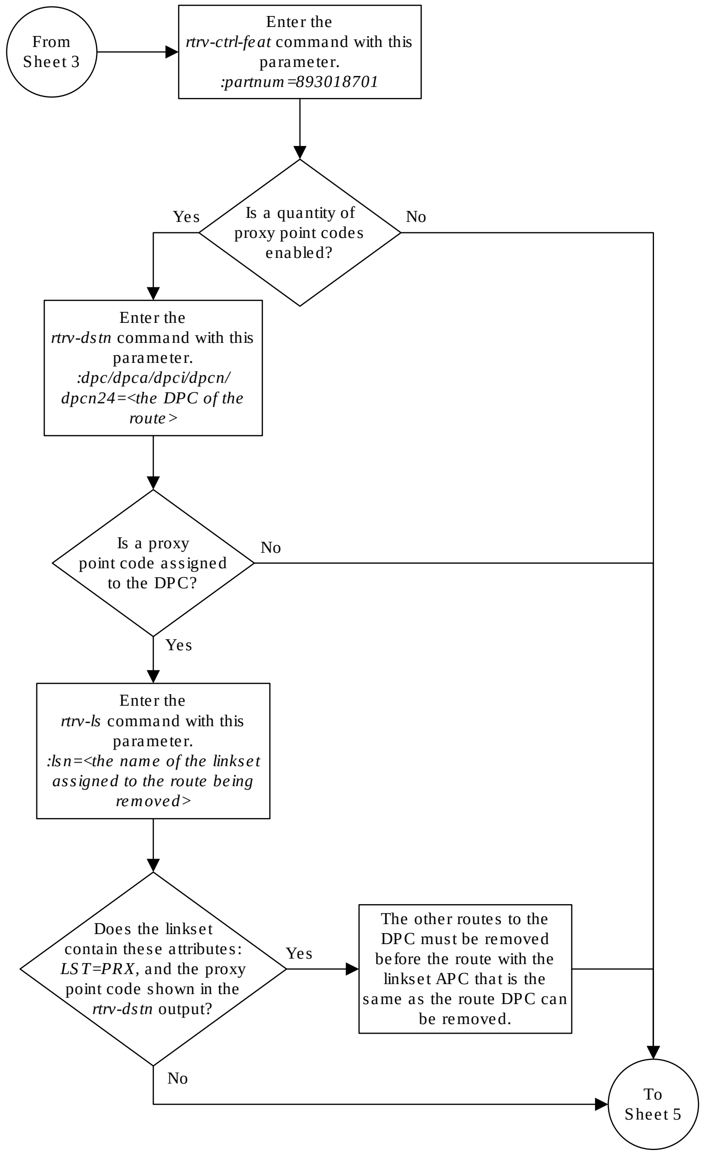
Sheet 1 of 8


From Sheet 1
Enter the rtrv-tt command.
Enter the rtrv-gtt command with these parameters.
:type=<translation type from the rtrv-tt command output>
:pc/pca/pci/pcn/pcn24=<DPC of the route being removed>
Are entries displayed in the rtrv-gtt output?
Yes
No
Perform the "Removing a Global Title Translation" procedure to remove the entries displayed in the rtrv-gtt output.
Have all the global title translations been checked?
No
Yes
Enter the rtrv-gttset command.
Enter the rtrv-gta command with these parameters.
:gttsn=<GTT set name from the rtrv-gttset command output>
:pc/pca/pci/pcn/pcn24=<DPC of the route being removed>
Are entries displayed in the rtrv-gta output?
Yes
No
Perform the "Removning Global Title Address Information" procedure to remove the entries displayed in the rtrv-gta output.
Have all the global title translations been checked?
No
Yes
To Sheet 3

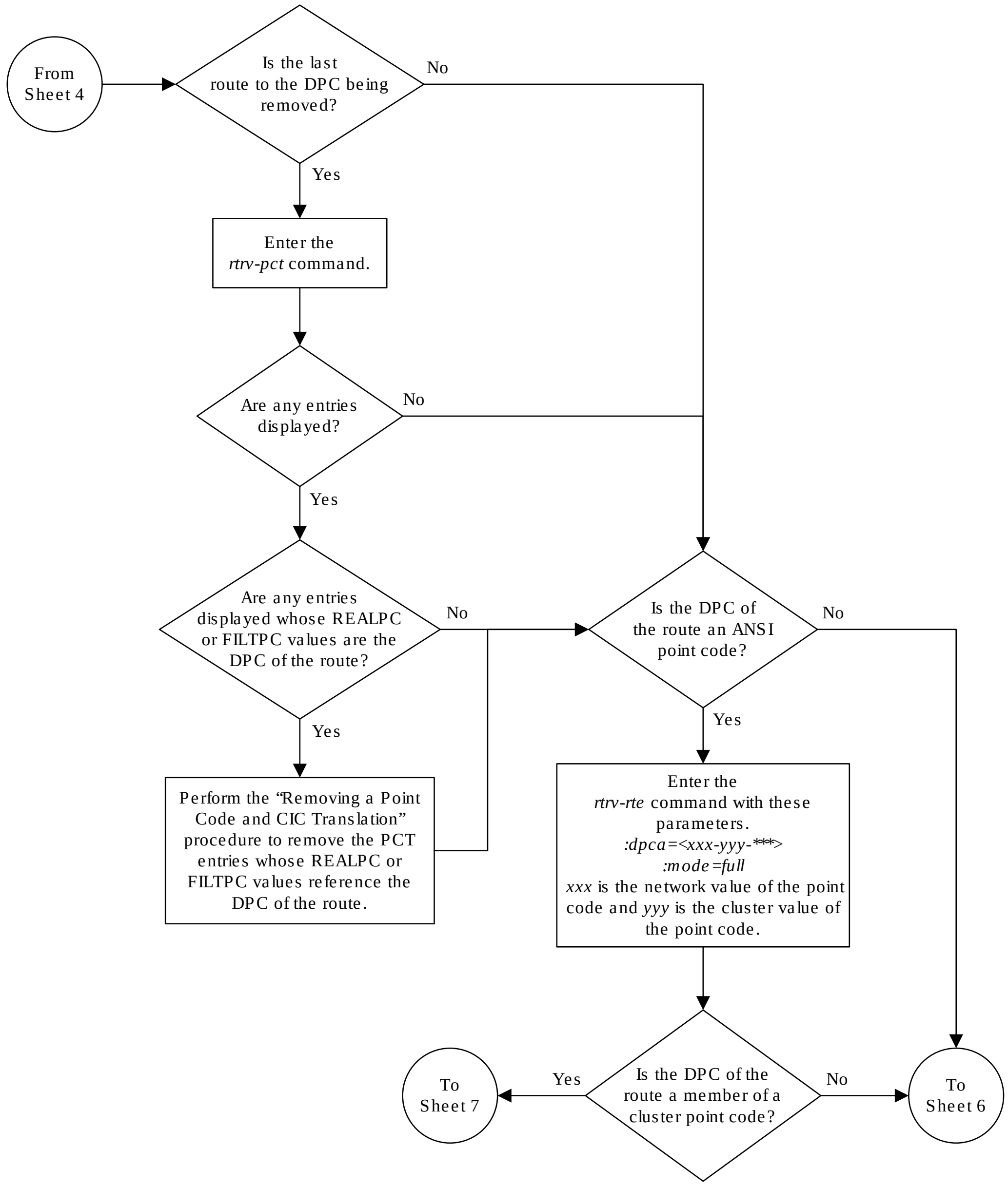
Sheet 2 of 8


From Sheet 2
Enter the rtrv-ppsopts command.
Do any entries in the rtrv-ppsopts output contain the DPC of the route that is being removed?
Yes
No
Enter the chg-ppsopts command with these parameters. :ppt=<the prepaid portability type containing the DPC of the route that is being removed> :pc/pca/pci/pcn=none Repeat this step for all entries in the rtrv-ppsopts output that containing the DPC of the route that is being removed.
From Sheet 1
Enter the rtrv-gws-redirect command.
Does the gateway screening redirect function DPC reference the route DPC?
No
Yes
Perform the "Changing the Gateway Screening Redirect Parameters" procedure to change the gateway screening redirect function point code
To Sheet 4

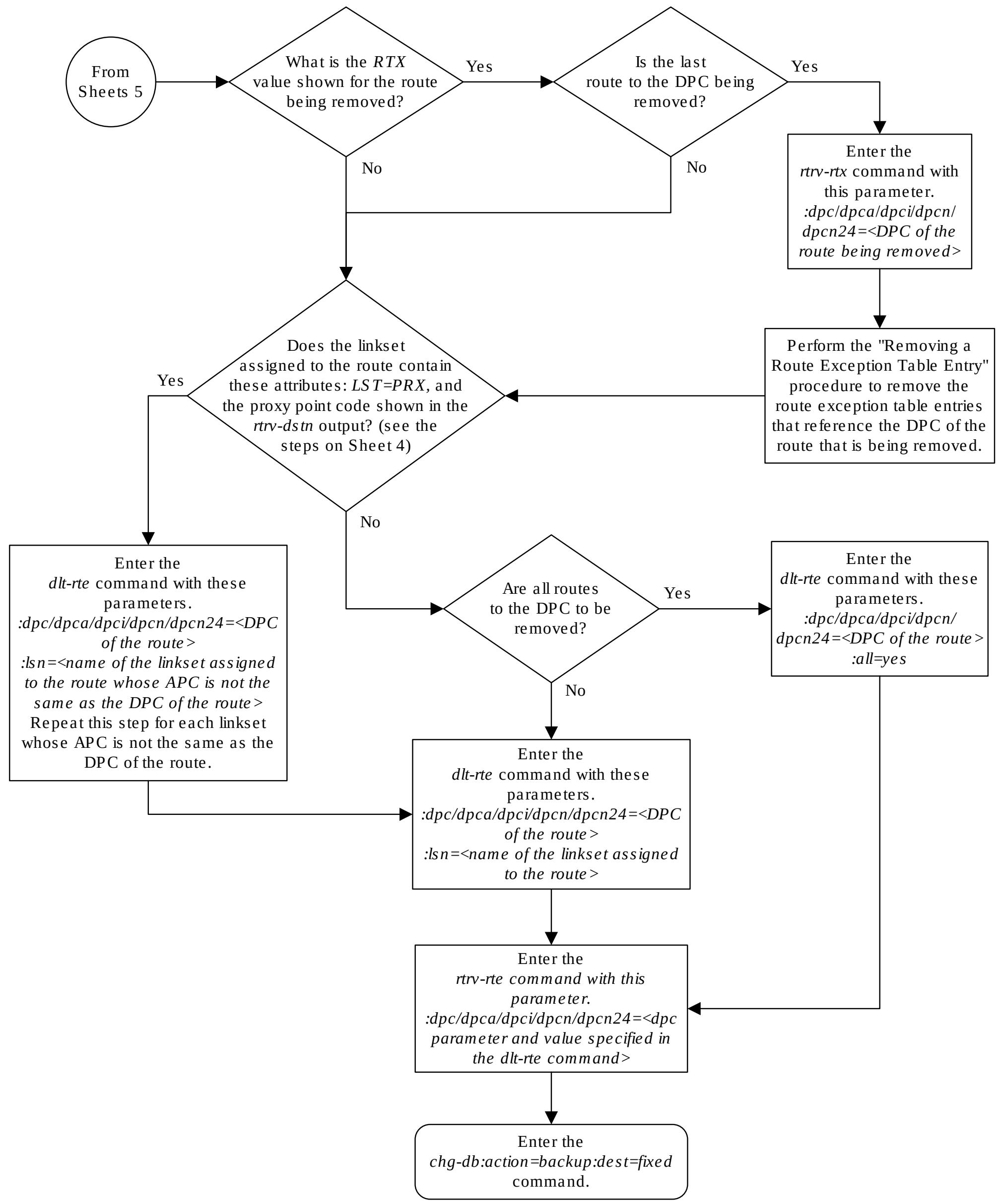
Sheet 3 of 8


From Sheet 3
Enter the *rtrv-ctrl-feat* command with this parameter. *:partnum=893018701*
Is a quantity of proxy point codes enabled?
Yes
No
Enter the *rtrv-dstn* command with this parameter. *:dpc/dpca/dpci/dpcn/dpcn24=<the DPC of the route>*
Is a proxy point code assigned to the DPC?
No
Yes
Enter the *rtrv-ls* command with this parameter. *:lsn=<the name of the linkset assigned to the route being removed>*
Does the linkset contain these attributes: *LST=PRX*, and the proxy point code shown in the *rtrv-dstn* output?
Yes
The other routes to the DPC must be removed before the route with the linkset APC that is the same as the route DPC can be removed.
No
To Sheet 5

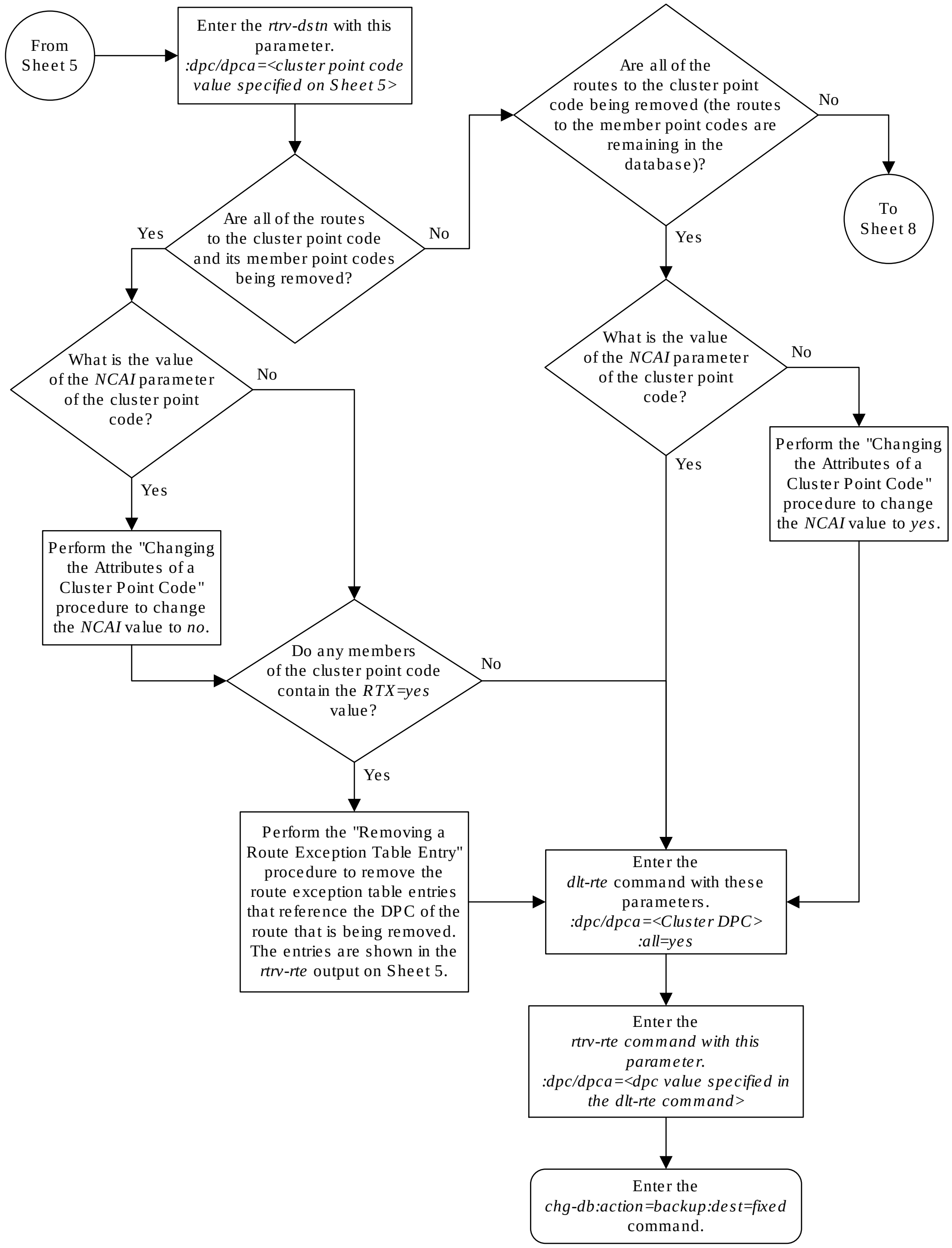
Sheet 4 of 8


From Sheet 4
Is the last route to the DPC being removed?
No
Yes
Enter the rtrv-pct command.
Are any entries displayed?
No
Yes
Are any entries displayed whose REALPC or FILTPC values are the DPC of the route?
No
Yes
Perform the "Removing a Point Code and CIC Translation" procedure to remove the PCT entries whose REALPC or FILTPC values reference the DPC of the route.
Is the DPC of the route an ANSI point code?
No
Yes
Enter the rtrv-rte command with these parameters.
:dpca=<xxx-yyy-***>
:mode=full
xxx is the network value of the point code and yyy is the cluster value of the point code.
Is the DPC of the route a member of a cluster point code?
Yes
No
To Sheet 7
To Sheet 6

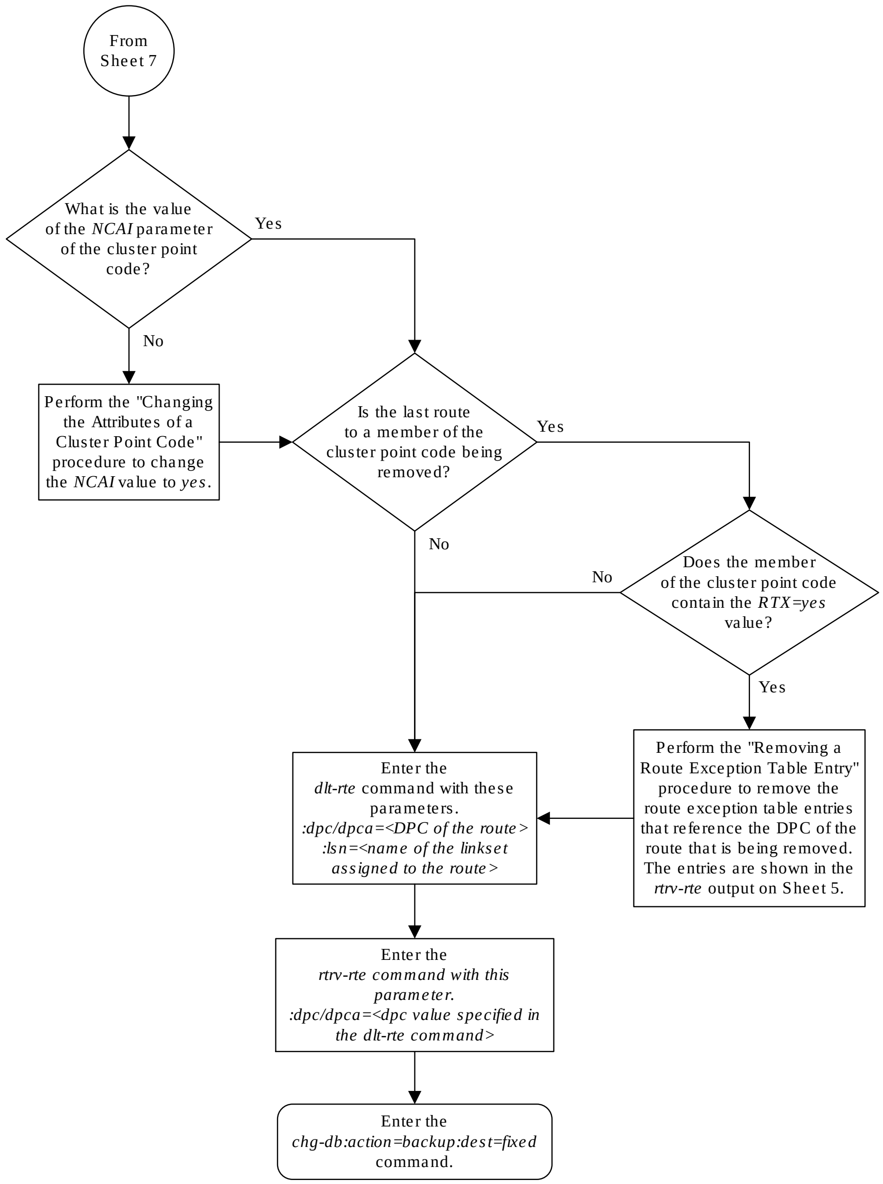
Sheet 5 of 8


From Sheets 5
What is the RTX value shown for the route being removed?
Yes
No
Is the last route to the DPC being removed?
Yes
No
Enter the rtrv-rtx command with this parameter. :dpc/dpca/dpci/dpcn/ dpcn24=<DPC of the route being removed>
Perform the "Removing a Route Exception Table Entry" procedure to remove the route exception table entries that reference the DPC of the route that is being removed.
Does the linkset assigned to the route contain these attributes: LST=PRX, and the proxy point code shown in the rtrv-dstn output? (see the steps on Sheet 4)
Yes
No
Enter the dlt-rte command with these parameters. :dpc/dpca/dpci/dpcn/dpcn24=<DPC of the route> :lsn=<name of the linkset assigned to the route whose APC is not the same as the DPC of the route> Repeat this step for each linkset whose APC is not the same as the DPC of the route.
Are all routes to the DPC to be removed?
Yes
No
Enter the dlt-rte command with these parameters. :dpc/dpca/dpci/dpcn/ dpcn24=<DPC of the route> :all=yes
Enter the dlt-rte command with these parameters. :dpc/dpca/dpci/dpcn/dpcn24=<DPC of the route> :lsn=<name of the linkset assigned to the route>
Enter the rtrv-rte command with this parameter. :dpc/dpca/dpci/dpcn/dpcn24=<dpc parameter and value specified in the dlt-rte command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 6 of 8


From Sheet 5
Enter the rtrv-dstn with this parameter. :dpc/dpca=<cluster point code value specified on Sheet 5>
Are all of the routes to the cluster point code and its member point codes being removed?
Yes
No
Are all of the routes to the cluster point code being removed (the routes to the member point codes are remaining in the database)?
No
To Sheet 8
Yes
What is the value of the NCAI parameter of the cluster point code?
No
Yes
What is the value of the NCAI parameter of the cluster point code?
No
Yes
Perform the "Changing the Attributes of a Cluster Point Code" procedure to change the NCAI value to yes.
Perform the "Changing the Attributes of a Cluster Point Code" procedure to change the NCAI value to no.
Do any members of the cluster point code contain the RTX=yes value?
No
Yes
Perform the "Removing a Route Exception Table Entry" procedure to remove the route exception table entries that reference the DPC of the route that is being removed. The entries are shown in the rtrv-rte output on Sheet 5.
Enter the dlt-rte command with these parameters. :dpc/dpca=<Cluster DPC> :all=yes
Enter the rtrv-rte command with this parameter. :dpc/dpca=<dpc value specified in the dlt-rte command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 7 of 8



Sheet 8 of 8

3.24 Changing a Route

This procedure is used to change the relative cost of a route or the linkset assigned to a route in the database using the `chg-rte` command.

The `chg-rte` command uses these parameters.

`:dpc/dpca/dpci/dpcn/dpcn24` – The destination point code of the node that the traffic is bound for.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes.

`:lsn` – The name of the linkset that is currently assigned to the route.

`:rc` – The relative cost (priority) for this route.

`:nlsn` – The name of the new linkset that will carry the traffic bound for the node specified by the destination point code.

The route to be changed must exist in the database. This can be verified in 1.

If the **DPC** of the route being changed is a private point code, or if the `ipgwapc` parameter of the linkset assigned to the route is `yes`, the route is an **IPGWx** route (a route that contains an IPGWx linkset). The IPGWx route can contain only one linkset. The DPC of an IPGWx route must either be the **APC** of the IPGWx linkset or the **SAPC** assigned to the IPGWx linkset. The DPC of the route cannot be changed. The SAPC can be assigned to only one linkset. As a result, the linkset assigned to the IPGWx route cannot be changed. Only the `rc` parameter value assigned to the route can be changed.

The examples in this procedure are used to change the relative cost assigned to the linkset `ls01` for the route to DPC `003-003-003` in the database to change the name of linkset `ls01` to `lsa2`.

Changing Routes Other than IPGWx Routes

If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six routes in the routeset can be assigned the same relative cost value. It is recommended that the routeset be provisioned with a group of four routes that have the same relative cost value and another group of two routes that have the same relative cost value. Three or five routes in the routeset that have the same relative cost value can be provisioned, but the odd number makes it more difficult to distribute the route traffic evenly. Six routes in the routeset that have the same relative cost value can be provisioned, but this does not allow for any backup routes and also offers the worst chance for congestion and queuing issues during network failures. If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, a maximum of two linksets can be assigned the same relative cost value. The relative cost value of the route is defined by the `rc` parameter of the `chg-rte` command and is shown in the `RC` field in the output of the `rtrv-rte` command.

The **ANSI** DPC (DPC/**DPCA**) of the route can use either a full point code, a cluster point code, or a network routing point code. ITU DPCs (**DPCI** and **DPCN** - 14-bit or 24-bit DPCNs) must use full point codes. For more information on full and cluster point codes, go to the Cluster Routing and Management Diversity (CRMD) section. For more information on network routing point codes, go to the Network Routing section.

The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs. The DPC of the route must be defined as a true point code in the `rtrv-dstn` output. Alias point codes and secondary point codes cannot be used.

True point codes are shown in the output of the `rtrv-dstn` command in the `DPCA`, `DPCI`, `DPCN`, or `DPCN24` fields.

Either the `nlsn` or `rc` parameters, or both, must be specified with the `chg-rte` command. If neither of these parameters are specified, the command is rejected.

The linkset specified by the `nlsn` parameter must be in the database and must contain at least one signaling link. This can be verified with the `rtrv-ls` command and specifying the name of the linkset with the `lsn` parameter.

If the DPC of the route is a cluster point code or a network routing point code, only linksets, specified with either the `lsn` or `nlsn` parameters, whose linkset type is either B, C, or D can be assigned to the route. The linkset type is shown in the `LST` field of the `rtrv-ls` command output. If the linkset type of the desired linkset is either A, E, or PRX, one of three actions must be taken.

- Choose another linkset with the linkset type B, C, or D.
- Change the linkset type of an existing linkset – perform the Changing an SS7 Linkset procedure.
- Add a new linkset to the database with the necessary signaling links and the linkset type B, C, or D.
  1. Perform the Adding an SS7 Linkset procedure to add the linkset.
  2. If the necessary signaling links are not in the database, go to the Adding an SS7 Signaling Link procedure and add the signaling links to the database.

If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to `no`, then all destinations in the cluster have the same route as the cluster point code, with the same attributes as the route to the cluster point code. If the nested cluster allowed indicator is set to `yes`, then the routes to the members of the cluster point code, and the attributes of these routes, can be different from the route to the cluster point code. For more information, see the Nested Cluster Routing section.

If the APC of the linkset assigned to the route and the DPC of the route are the same, the name of the linkset cannot be changed in this procedure if the linkset and the DPC of the route contain these attributes.

- The DPC of the route contains a proxy point code.
- The linkset type of the linkset is PRX (a proxy linkset) and the proxy point code that is assigned to the DPC of the route is also assigned to the linkset.

These attributes can be verified by entering the rtrv-dstn command with the DPC of the route and the rtrv-ls command with the linkset name assigned to the route. If these attributes are present and you wish to change the name of the linkset, perform the Removing a Route procedure to remove the linkset from the DPC of the route. To remove a proxy linkset from the DPC of the route, all the linksets assigned to the DPC must be removed. After the linksets have been removed from the DPC, Add the new linkset to the DPC of the route by performing the Adding a Route Containing an SS7 DPC procedure.

Canceling the `RTRV-LS` and `RTRV-RTE` Commands

Because the `rtrv-ls` and `rtrv-rte` commands used in this procedure can output information for a long period of time, the `rtrv-ls` and `rtrv-rte` commands can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` and `rtrv-rte` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` or `rtrv-rte` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` or `rtrv-rte` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` or `rtrv-rte` commands were entered, from another terminal other that the terminal where the `rtrv-ls` or `rtrv-rte` commands were entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the current route configuration using the `rtrv-rte` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   001-002-003 --------- --------------    ls04       10    001-002-003
                                               RTX:No  CLLI=ls04clli
   002-002-100 --------- --------------    ls01       10    002-002-100
                                           ls02       20    004-004-004
                                           ls03       30    003-003-003
                                               RTX:No  CLLI=ls01clli
   002-007-008 --------- --------------    ls06       10    002-007-008
                                               RTX:No  CLLI=ls06clli
   002-009-003 ---------- --------------   ls05       10    002-009-003
                                               RTX:No  CLLI=-----------
   003-003-003 --------- --------------    ls03       10    003-003-003
                                           ls01       20    002-002-100
                                           ls02       30    004-004-004
                                               RTX:No  CLLI=ls03clli
   004-004-004 --------- --------------    ls02       10    004-004-004
                                           ls01       20    002-002-100
                                           ls03       30    003-003-003
                                               RTX:No  CLLI=ls02clli
   009-002-003 ---------- --------------   ls07       10    009-002-003
                                               RTX:No  CLLI=-----------
   140-012-004    1-111-1      11121       ls000001   10    240-012-002
                                           ls000002   10    240-012-002
                                           ls000003   20    240-012-002
                                           ls000004   30    240-012-002
                                           ls000005   40    240-012-002
                                           ls000006   50    240-012-002
                                               RTX:No  CLLI=dp1
   140-012-005 1-111-2       11122         ls000001   10    240-012-002
```

```
                                               ls000002    10
240-012-002
                                               ls000003    20
240-012-002
                                               ls000004    30
240-012-002
                                               ls000005    40
240-012-002
                                               ls000006    50
240-012-002
                                                   RTX:No   CLLI=dp2
   179-100-087 ---------- --------------   atmansi0    10
179-100-087
                                                   RTX:No
CLLI=-----------
   200-050-176 ---------- --------------   atmansi1    10
200-050-176
                                                   RTX:No
CLLI=-----------
   DPCI        ALIASN/N24       ALIASA      LSN         RC     APC
   2-234-5     11-13-3-3       240-111-111  ls100001    10     1-234-5
                                            ls100002    10     1-234-6
                                            ls100003    20     1-234-7
                                            ls100004    30     1-234-1
                                            ls100005    40     1-234-2
                                            ls100006    50     1-234-3
                                                RTX:No   CLLI=idp1
   3-150-4 -------------   --------------   lsi7        10     3-150-4
                                                RTX:No   CLLI=lsi7clli
   DPCN              ALIASA          ALIASI LSN         RC     APC
   10685       ------------- ---------      lsn5        10     10685
                                                RTX:No   CLLI=lsi5clli
   13111          011-222-111 0-001-1       ls200001    10     11111
                                            ls200002    10     11112
                                            ls200003    20     11113
                                            ls200004    30     11114
                                            ls200005    40     11115
                                            ls200006    50     11116
                                                RTX:No   CLLI=ndp1
   DPCN24            ALIASA          ALIASI LSN         RC     APC
```

If the DPC of the route being changed is a private point code, the route is an IPGWx route (a route that contains an IPGWx linkset). The DPC of an IPGWx route must either be the APC of the IPGWx linkset or the SAPC assigned to the IPGWx linkset. The DPC of the route cannot be changed. The SAPC can be assigned to only one linkset. As a result, the linkset assigned to the IPGWx route cannot be changed. Only the `rc` parameter value assigned to the route can be changed. If you wish to change the `rc` parameter value, continue the procedure with 9.

If you do not wish to change the `rc` parameter value, this procedure cannot be performed.

If the DPC of the route being changed is not a private point code, the route contains two or more linksets, and the `rc` parameter values of the routes are being changed, continue the procedure performing one of these steps.

- If no more than two routes in the routeset will have the same relative cost value, continue the procedure by performing one of these steps.
  - If the linkset name will not be changed, continue the procedure with 9.
  - If the linkset name will be changed, continue the procedure by performing one of these steps.
    - if the APC of the linkset and the DPC of the route are the same. continue the procedure with 4.
    - If the APC of the linkset and the DPC of the route are not the same, continue the procedure with 6.
- If more than two routes in the routeset will have the same relative cost value, continue the procedure by performing one of these steps.
  - If routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
    - If the linkset name will not be changed, continue the procedure with 9.
    - If the linkset name will be changed, continue the procedure by performing one of these steps.
      - if the APC of the linkset and the DPC of the route are the same. continue the procedure with 4.
      - If the APC of the linkset and the DPC of the route are not the same, continue the procedure with 6.
  - If routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 3.

If the DPC of the route being changed is not a private point code, and the route contains only one linkset, continue the procedure with 2 to verify the `ipgwapc` value assigned to the linkset.

2. Display the linkset assigned to the route by entering the `rtrv-ls` command with the name of the linkset.

   For this example, enter this command.

   `rtrv-ls:lsn=ls04`

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls04          001-002-003   none 1   1   no  A   1    off off off ---   on

          CLLI          TFATCABMLQ MTPRSE ASL8
          ls04clli      1          no     ---
```

```
          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          yes     ---------- 100   100    % 80      % CdPA

          LOC  LINK SLC TYPE
          1303 A     0  SS7IPGW

Link set table is (10 of 1024) 1% full.
```

If the `ipgwapc` parameter value of the linkset is `yes`, the route is an IPGWx route (a route that contains an IPGWx linkset). The DPC of an IPGWx route must either be the APC of the IPGWx linkset or the **SAPC** assigned to the IPGWx linkset. The DPC of the route cannot be changed. The SAPC can be assigned to only one linkset. As a result, the linkset assigned to the IPGWx route cannot be changed. Only the `rc` parameter value assigned to the route can be changed. If you wish to change the `rc` parameter value, continue the procedure with 9.

If you do not wish to change the `rc` parameter value, this procedure cannot be performed.

If the `ipgwapc` parameter value of the linkset is `no`, continue the procedure by performing one of these step.

- If no more than two routes in the routeset will have the same relative cost value, continue the procedure by performing one of these steps.
  - If the linkset name will not be changed, continue the procedure with 9.
  - If the linkset name will be changed, continue the procedure by performing one of these steps.
    - if the APC of the linkset and the DPC of the route are the same. continue the procedure with 4.
    - If the APC of the linkset and the DPC of the route are not the same, continue the procedure with 6.
- If more than two routes in the routeset will have the same relative cost value, continue the procedure by performing one of these steps.
  - If routesets that contain more than two routes with the same relative cost value are shown in the `rtrv-rte` output, continue the procedure by performing one of these steps.
    - If the linkset name will not be changed, continue the procedure with 9.
    - If the linkset name will be changed, continue the procedure by performing one of these steps.
      - if the APC of the linkset and the DPC of the route are the same. continue the procedure with 4.
      - If the APC of the linkset and the DPC of the route are not the same, continue the procedure with 6.
  - If routesets that contain more than two routes with the same relative cost value are not shown in the `rtrv-rte` output, continue the procedure with 3.

3. For a routeset to have more than two routes with the same relative cost value, the 6-Way Loadsharing on Routesets feature must be enabled and turned on.

To verify the status of the 6-Way Loadsharing on Routesets feature, enter this command.

`rtrv-ctrl-feat:partnum=893019801`

The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, perform Activating the 6-Way Loadsharing on Routesets Feature to enable and turn on the 6-Way Loadsharing on Routesets feature.

After the 6-Way Loadsharing on Routesets feature has been enabled and turned on, or if the `rtrv-ctrl-feat` output shows that the 6-Way Loadsharing on Routesets feature is enabled and turned on, continue this procedure by performing one of these steps.

- If the linkset name will not be changed, continue the procedure with 9.
- If the linkset name will be changed, continue the procedure by performing one of these steps.
  - if the APC of the linkset and the DPC of the route are the same. continue the procedure with 4.
  - If the APC of the linkset and the DPC of the route are not the same, continue the procedure with 6.

4. Display the attributes of the linkset whose DPC is the same as the DPC of the route by entering the `rtrv-ls` command with the name of the linkset. For this example, enter this command.

   `rtrv-ls:lsn=ls02`

   This is an example of the possible output.

```
rlghncxa03w 07-08-14 09:24:36 GMT  EAGLE5 37.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls02          004-004-004  none 1    1   no  PRX 1    off off off no
off
```

```
              PPCA          CLLI        TFATCABMLQ MTPRSE ASL8
              010-010-010   ----------- 1          ---    no

           IPGWAPC MATELSN    IPTPS  LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ----   ---      ---       CdPA

Link set table is (9 of 1024) 1% full.
```

If the linkset type is PRX, continue the procedure with 5.

If the linkset type is not PRX, continue the procedure with 6.

5. Display the DPC of the route by entering the `rtrv-dstn` command with the DPC of the route. For this example, enter this command.

   `rtrv-dstn:dpca=004-004-004`

   This is an example of the possible output.

```
rlghncxa03w 10-12-15 09:22:39 GMT  EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI
ALIASN/N24    DMN
   004-004-004   ----------- no  --- ----------
--------------   SS7

   PPCA         NCAI PRX     RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   010-010-010  ---- no      none   off   none     no     no    none

Destination table is (14 of 2000) 1% full
Alias table is (0 of 12000) 0% full
PPC table is (2 of 10) 20% full
```

   If the linkset shown in 4 does not contain the proxy point code shown in this step, continue the procedure with 6.

   If the linkset shown in 4 contains the proxy point code shown in this step, the linkset name cannot be changed in this procedure. If you wish to change the linkset name, perform the Removing a Route procedure to remove the linkset from the DPC of the route. To remove a proxy linkset from the DPC of the route, all the linksets assigned to the DPC must be removed. After the linksets have been removed from the DPC, Add the new linkset to the DPC of the route by performing the Adding a Route Containing an SS7 DPC procedure. However, the `RC` value for this linkset can be changed. If you wish to change the `RC` value for this linkset, repeat this procedure from 3.

6. Display the linksets in the database with the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
```

```
SLSCI NIS
e1e2          001-207-000   none 1    1    no   B    6     off off off no
off
ls1305        000-005-000   none 1    1    no   A    1     off off off no
off
ls1307        000-007-000   none 1    1    no   A    1     off off off no
off
e1m1s1        001-001-001   none 1    1    no   A    7     off off off no
off
e1m1s2        001-001-002   none 1    1    no   A    7     off off off no
off

                                 L3T SLT                 GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none 1    1    no   B    4     off off off ---    on
ls1315        0-015-0       none 1    1    no   A    1     off off off ---
off
ls1317        0-017-0       none 1    1    no   A    1     off off off ---    on
e1m2s1        1-011-1       none 1    1    no   A    7     off off off ---
off
e1m2s2        1-011-2       none 1    1    no   A    7     off off off ---
off

Link set table is (10 of 1024) 1% full.
```

If the new linkset to be added to the route is not shown in the `rtrv-ls` output, and the DPC of the route is not an ANSI point code, add the new linkset by performing the Adding an SS7 Linkset procedure.

After the new linkset has been added, or if the new linkset is shown in the `rtrv-ls` output, continue the procedure by performing one of these steps.

- If the DPC of the route is not a cluster point code, continue the procedure with 8.
- If the DPC of the route is a cluster point code, continue the procedure with 7.

7. Display the `ncai` parameter value assigned to the cluster point code using the `rtrv-dstn` command and specifying the cluster point code.

   If the `ncai` parameter value is `no`, then the route to the **DPC** must be the same as the route to the cluster point code. If the `ncai` parameter value is `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code. The `ncai` value is shown in the `NCAI` field of the `rtrv-dstn` output. For this example, enter this command.

   `rtrv-dstn:dpca=111-011-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:16:37 GMT EAGLE5 43.0.0

   DPCA          CLLI        BEI ELEI   ALIASI          ALIASN/N24     DMN
   111-011-*     rlghncbb000 yes yes  ----------       --------------   SS7

   SPCA         NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP SCCPMSGCNV
```

```
   -----------  ----         none   off   none     no      no     none

Destination table is (12 of 2000) 1% full
Alias table is (6 of 8000) 1% full
```

> **Note:**
>
> If the DPC of the route is not a cluster point code or a 14-bit ITU-N point code with group codes, continue the procedure with 9.

8. Display each linkset being assigned to the route to verify the `multgc` parameter value with the `rtrv-ls` command, specifying the name of the linkset that will be assigned to the route.

   If the `multgc` linkset parameter value is `yes`, then 14-bit ITU National DPCs with group codes that are different from the linkset APC group code can be assigned to the route. If the `multgc` value is set to `no`, then only 14-bit ITU National DPCs with group codes that are the same as the linkset APC group code can be assigned to the route. The `multgc` value is shown in the `MULTGC` field of the `rtrv-ls` output.

   For this example, enter the following command.

   `rtrv-ls:lsn=e1e2i`

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i          1-202-0       none 1    1   no  B   10   off off off
---   on

          CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
          -----------  5          no     ---  none     1      no

          ITUTFR
          off

          IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
          no      ---------- ---   ---      ---       CdPA

          LOC  LINK SLC TYPE     IPLIML2
          1311 A     0  IPLIMI   M2PA
          1313 A     1  IPLIMI   M2PA
          1311 B     2  IPLIMI   M2PA
          1313 B     3  IPLIMI   M2PA

          SAPCN
          03664
```

```
Link set table is (10 of 1024) 1% full.
```

9. Change the route configuration in the database using the `chg-rte` command.

   For this example, enter this command.

   `chg-rte:dpca=003-003-003:lsn=ls01:rc=50:nlsn=lsa2`

   These are the rules that apply to adding a route.

   - An IPGWx route can contain only one linkset, and only the `rc` parameter value for an IPGWx route can be changed. For an SS7 route other than an IPGWx route, a maximum of two linksets can be assigned the same `rc` parameter value, if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six linksets in the route can have the same `rc` parameter value.
   - If the DPC of the route is a cluster point code or a network routing point code, the link set type of the linkset assigned to the route must be either B, C, or D.
   - If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (`ncai` parameter of either the `ent-dstn` or `chg-dstn` command) is set to `no`, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to `yes`, the route to the member of the cluster does not have to be the same as the route to the cluster point code.
   - For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the `MULTGC` value set to `yes`, then the group code of the linkset's APC can be different from the group code of the route's DPC. If the `MULTGC` value is set to `no`, then the group code of the linkset's APC must be the same as the group code of the route's DPC.
   - If the DPC of the route is a cluster point code, the linksets that will be assigned to the route, with the `nlsn` parameter, cannot specify the `ipgwapc=yes` parameter.
   - The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs.

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:45:54 GMT  EAGLE5 36.0.0
CHG-RTE: MASP A - COMPLTD
```

10. Verify the changes using the `rtrv-rte` command, specifying the destination point code of the route or the name of the routeset assigned to the route.

    For this example, enter this command.

    `rtrv-rte:dpca=003-003-003`

    This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0
```

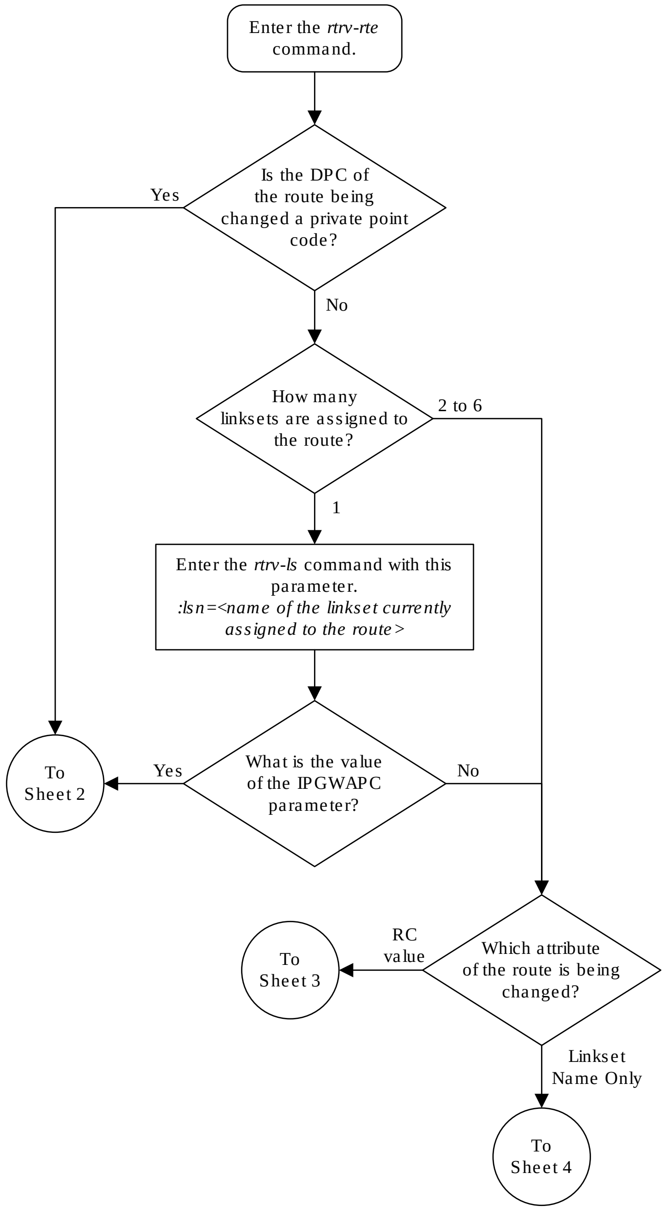
```
   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   003-003-003 ---------- --------------   ls03       10
003-003-003
                                           ls01       20
002-002-100
                                           ls02       30
004-004-004
                                               RTX:No  CLLI=ls03clli
```

11. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

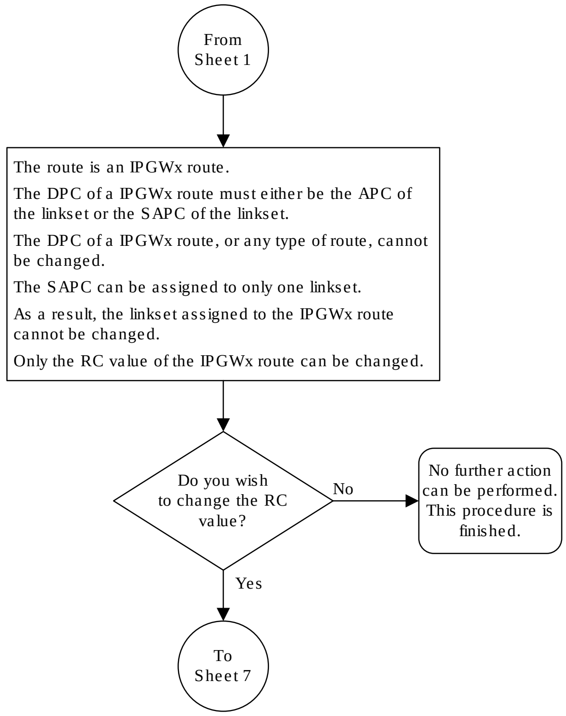
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

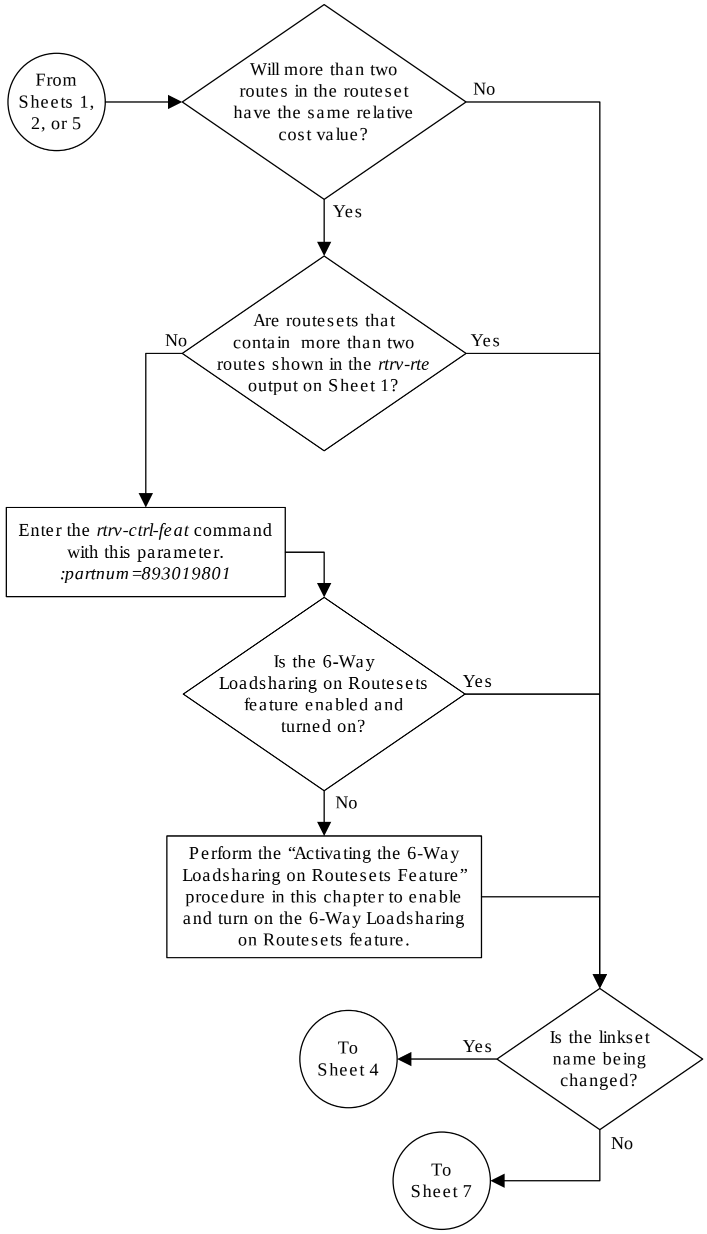
Figure 3-22 Changing a Route



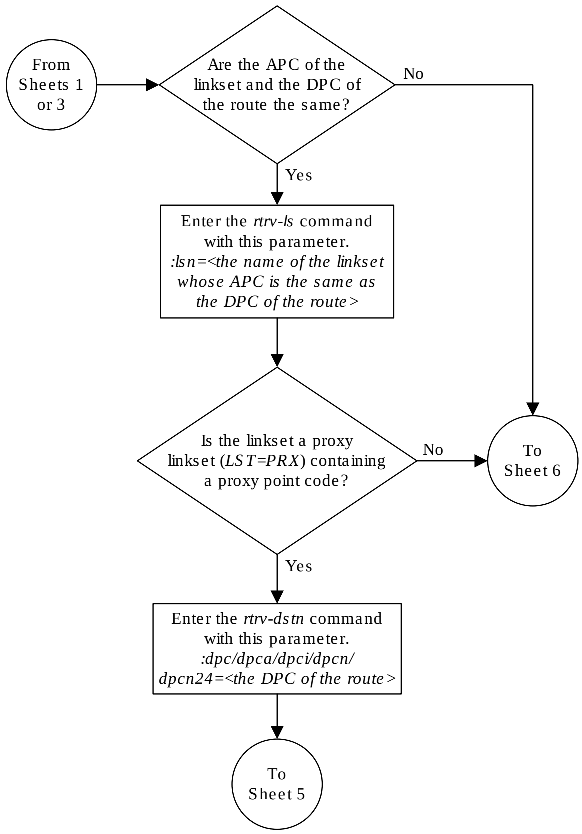
Sheet 1 of 8


From Sheet 1
The route is an IPGWx route.
The DPC of a IPGWx route must either be the APC of the linkset or the SAPC of the linkset.
The DPC of a IPGWx route, or any type of route, cannot be changed.
The SAPC can be assigned to only one linkset.
As a result, the linkset assigned to the IPGWx route cannot be changed.
Only the RC value of the IPGWx route can be changed.
Do you wish to change the RC value?
No
No further action can be performed. This procedure is finished.
Yes
To Sheet 7

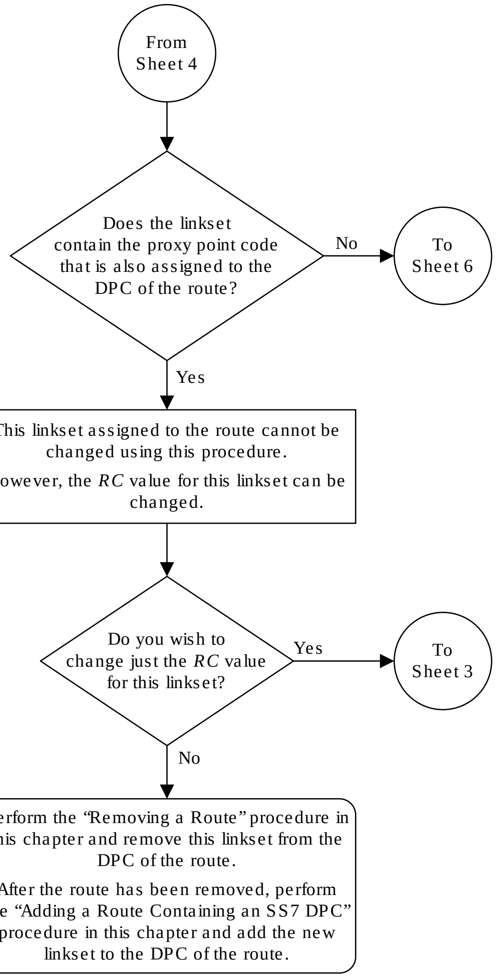
Sheet 2 of 8


From Sheets 1, 2, or 5
Will more than two routes in the routeset have the same relative cost value?
No
Yes
Are routesets that contain more than two routes shown in the *rtrv-rte* output on Sheet 1?
No
Yes
Enter the *rtrv-ctrl-feat* command with this parameter.
:partnum=893019801
Is the 6-Way Loadsharing on Routesets feature enabled and turned on?
Yes
No
Perform the "Activating the 6-Way Loadsharing on Routesets Feature" procedure in this chapter to enable and turn on the 6-Way Loadsharing on Routesets feature.
Is the linkset name being changed?
Yes
To Sheet 4
No
To Sheet 7

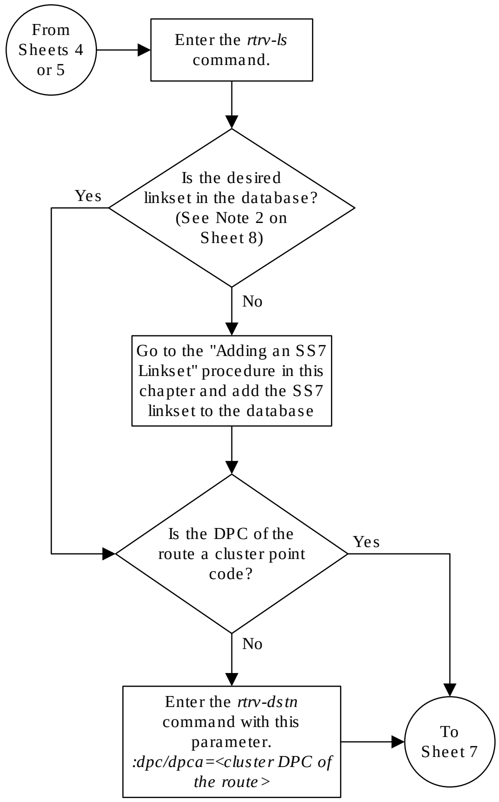
Sheet 3 of 8


From Sheets 1 or 3
Are the APC of the linkset and the DPC of the route the same?
No
Yes
Enter the rtrv-ls command with this parameter.
:lsn=<the name of the linkset whose APC is the same as the DPC of the route>
Is the linkset a proxy linkset (LST=PRX) containing a proxy point code?
No
To Sheet 6
Yes
Enter the rtrv-dstn command with this parameter.
:dpc/dpca/dpci/dpcn/dpcn24=<the DPC of the route>
To Sheet 5

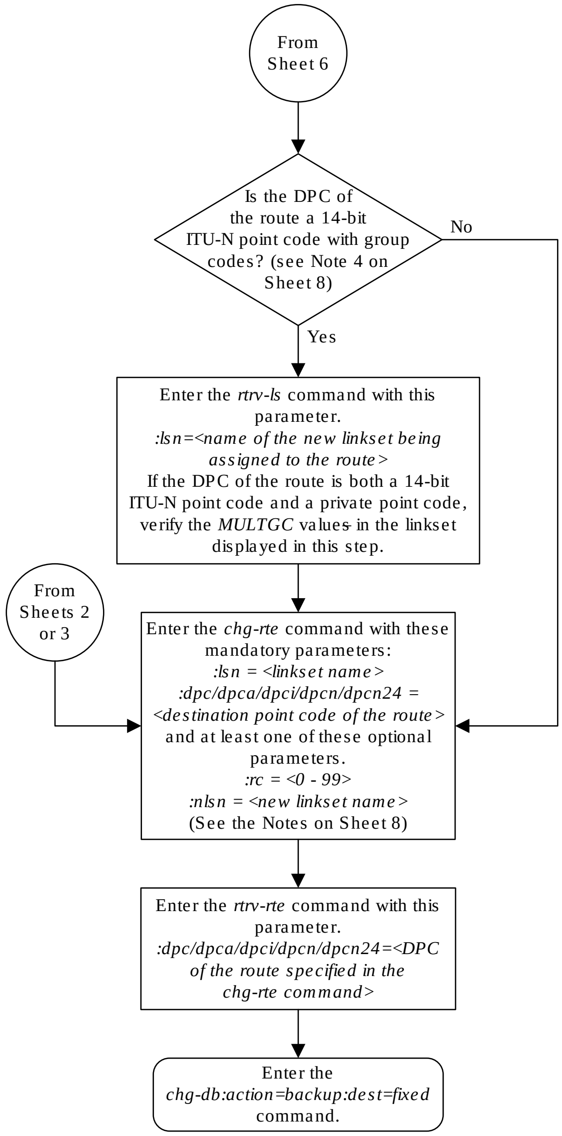
Sheet 4 of 8


From Sheet 4
Does the linkset contain the proxy point code that is also assigned to the DPC of the route?
No
To Sheet 6
Yes
This linkset assigned to the route cannot be changed using this procedure.
However, the RC value for this linkset can be changed.
Do you wish to change just the RC value for this linkset?
Yes
To Sheet 3
No
Perform the "Removing a Route" procedure in this chapter and remove this linkset from the DPC of the route.
After the route has been removed, perform the "Adding a Route Containing an SS7 DPC" procedure in this chapter and add the new linkset to the DPC of the route.

Sheet 5 of 8


From Sheets 4 or 5
Enter the rtrv-ls command.
Is the desired linkset in the database? (See Note 2 on Sheet 8)
Yes
No
Go to the "Adding an SS7 Linkset" procedure in this chapter and add the SS7 linkset to the database
Is the DPC of the route a cluster point code?
Yes
No
Enter the rtrv-dstn command with this parameter.
:dpc/dpca=<cluster DPC of the route>
To Sheet 7

Sheet 6 of 8


From Sheet 6
Is the DPC of the route a 14-bit ITU-N point code with group codes? (see Note 4 on Sheet 8)
No
Yes
Enter the rtrv-ls command with this parameter.
:lsn=<name of the new linkset being assigned to the route>
If the DPC of the route is both a 14-bit ITU-N point code and a private point code, verify the MULTGC values in the linkset displayed in this step.
From Sheets 2 or 3
Enter the chg-rte command with these mandatory parameters:
:lsn = <linkset name>
:dpc/dpca/dpci/dpcn/dpcn24 = <destination point code of the route>
and at least one of these optional parameters.
:rc = <0 - 99>
:nlsn = <new linkset name>
(See the Notes on Sheet 8)
Enter the rtrv-rte command with this parameter.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC of the route specified in the chg-rte command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 7 of 8

Notes:

1. An IPGWx route can contain only one linkset, and only the *rc* parameter value for an IPGWx route can be changed. For an SS7 route other than an IPGWx route, a maximum of two linksets can be assigned the same *rc* parameter value, if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, a maximum of six linksets in the route can have the same *rc* parameter value.

2. If the DPC of the route is a cluster point code or a network routing point code, the link set type of the linkset assigned to the route must be either B, C, or D.

3. If the DPC of the route is a member of a cluster point code, and the nested cluster allowed indicator (*ncai* parameter of either the *ent-dstn* or *chg-dstn* command) is set to no, then the route to the DPC must be the same as the route to the cluster point code. If the nested cluster allowed indicator is set to yes, the route to the member of the cluster does not have to be the same as the route to the cluster point code.

4. For routes containing 14-bit ITU National DPCs with group codes, if the linkset assigned to the route has the MULTGC value set to yes, then the group code of the linkset's APC can be different from the group code of the route's DPC. If the MULTGC value is set to no, then the group code of the linkset's APC must be the same as the group code of the route's DPC.

5. If the DPC of the route is a cluster point code, the linksets that will be assigned to the route, with the *nlsn* parameter, cannot specify the *ipgwapc=yes* parameter.

6. The DPC of the route must be of the same format as the APC of the linkset being added to the route. That is, routes containing ANSI DPCs must have linksets with ANSI APCs; routes containing ITU-I DPCs must have linksets with ITU-I APCs; routes containing 14-bit ITU-N DPCs must have linksets with 14-bit ITU-N APCs; routes containing 24-bit ITU-N DPCs must have linksets with 24-bit ITU-N APCs.

Sheet 8 of 8

3.25 Changing Level 2 Timers

This procedure is used to change the values of a level 2 timer set using the `chg-l2t` command.

The `l2tset` parameter specifies the level 2 timer set that is being changed. The **EAGLE** contains 35 level 2 timer sets that signaling links can be assigned to. Level 2 timer sets are assigned to different types of signaling links as shown in Table 3-16.

Table 3-16 Level 2 Timer Sets

Level 2 Timer Set (l2tset Parameter Value)	Default Level 2 Timer Set Value for Signaling Links	Type of Signaling Link
1 - 10	1	Low-speed **ANSI** signaling links
11 - 20	11	Low-speed **ITU** signaling links
21 - 25	21	**ITU**-N high-speed signaling links for China
26 - 30	26	**ITU**-N high-speed signaling links for areas other than China
31 - 35	31	Unchannelized T1 high-speed signaling links

Each level 2 timer set contains seven timers. These tables define the timers and their values.

- Table 3-17
- Table 3-18
- Table 3-19
- Table 3-20
- Table 3-21

Table 3-17 Level 2 Timer Values - Low-Speed ANSI Signaling Links

Level 2 Timers	Level 2 Timer Sets 1 - 10 (in milliseconds)
Timer 1 – Aligned ready (`t1` parameter)	5000 - 20000 System Default - 13000
Timer 2 – Not aligned (`t2` parameter)	5000 - 30000 System Default - 11500
Timer 3 – Aligned (`t3` parameter)	5000 - 20000 System Default - 11500
Timer 4 – Normal proving period (`t4npp` parameter)	500 - 5000 System Default - 2300
Timer 4 – Emergency proving period (`t4epp` parameter)	200 - 1000 System Default - 600
Timer 5 – Sending **SIB** (`t5` parameter)	40 - 500 System Default - 100
Timer 6 – Remote congestion (`t6` parameter)	1000 - 10000 System Default - 4000
Timer 7 – Excessive delay of acknowledgment (`t7` parameter)	200 - 3000 System Default - 1500
NODATA - See the Notes.	100 - 500 System Default - 100

Table 3-17 (Cont.) Level 2 Timer Values - Low-Speed ANSI Signaling Links

Level 2 Timers	Level 2 Timer Sets 1 - 10 (in milliseconds)

Notes:

1. The NODATA timer specifies the amount of time that must pass with no transmissions on a signaling link before the EAGLE interprets the condition as a signaling link failure or a terminal equipment failure and initiates changeover procedures.

   > **Note:**
   >
   > The NODATA timer is configurable only for low speed SS7 links running BASIC Error Correction Method (ECM).
   > The NODATA timer is not configurable for low speed SS7 links running PCR ECM. The NODATA timer value is calculated as T2 (L2 timer 2 value)/3 for low speed SS7 links running PCR ECM.

Table 3-18 Level 2 Timer Values - Low-Speed ITU Signaling Links

Level 2 Timers	Level 2 Timer Sets 11 - 20 (in milliseconds)
Timer 1 – Aligned ready (`t1` parameter)	40000 - 50000 System Default - 40000
Timer 2 – Not aligned (`t2` parameter)	5000 - 150000 System Default - 30000
Timer 3 – Aligned (`t3` parameter)	1000 - 2000 System Default - 2000
Timer 4 – Normal proving period (`t4npp` parameter)	7500 - 9500 System Default - 8200
Timer 4 – Emergency proving period (`t4epp` parameter)	400 - 600 System Default - 500
Timer 5 – Sending **SIB** (`t5` parameter)	80 - 120 System Default - 100
Timer 6 – Remote congestion (`t6` parameter)	3000 - 6000 System Default - 4000
Timer 7 – Excessive delay of acknowledgment (`t7` parameter)	500 - 2000 System Default - 1500
NODATA - See the Notes.	100 - 500 System Default - 100

Table 3-18 (Cont.) Level 2 Timer Values - Low-Speed ITU Signaling Links

Level 2 Timers	Level 2 Timer Sets 11 - 20 (in milliseconds)

Notes:

1. The NODATA timer specifies the amount of time that must pass with no transmissions on a signaling link before the EAGLE interprets the condition as a signaling link failure or a terminal equipment failure and initiates changeover procedures.

> **Note:**
>
> The NODATA timer is configurable only for low speed SS7 links running BASIC Error Correction Method (ECM).
> The NODATA timer is not configurable for low speed SS7 links running PCR ECM. The NODATA timer value is calculated as T2 (L2 timer 2 value)/3 for low speed SS7 links running PCR ECM.

Table 3-19 Level 2 Timer Values - ITU-N High-Speed Signaling Links for China

Level 2 Timers	Level 2 Timer Sets 21 - 25 (in milliseconds)
Timer 1 – Aligned ready (`t1` parameter)	25000 - 350000 System Default - 150000
Timer 2 – Not aligned (`t2` parameter)	5000 - 150000 System Default - 130000
Timer 3 – Aligned (`t3` parameter)	1000 - 2000 System Default - 1000
Timer 4 – Normal proving period (`t4npp` parameter)	3000 - 70000 System Default - 30000
Timer 4 – Emergency proving period (`t4epp` parameter)	400 - 600 System Default - 500
Timer 5 – Sending **SIB** (`t5` parameter)	80 - 120 System Default - 100
Timer 6 – Remote congestion (`t6` parameter)	3000 - 6000 System Default - 5000
Timer 7 – Excessive delay of acknowledgment (`t7` parameter)	500 - 2000 System Default - 800

Table 3-20 Level 2 Timer Values - ITU-N High-Speed Signaling Links for Areas other than China

Level 2 Timers	Level 2 Timer Sets 26 - 30 (in milliseconds)
Timer 1 – Aligned ready (`t1` parameter)	25000 - 350000 System Default - 300000
Timer 2 – Not aligned (`t2` parameter)	5000 - 150000 System Default - 130000

Table 3-20 (Cont.) Level 2 Timer Values - ITU-N High-Speed Signaling Links for Areas other than China

Level 2 Timers	Level 2 Timer Sets 26 - 30 (in milliseconds)
Timer 3 – Aligned (`t3` parameter)	1000 - 2000 System Default - 1000
Timer 4 – Normal proving period (`t4npp` parameter)	3000 - 70000 System Default - 30000
Timer 4 – Emergency proving period (`t4epp` parameter)	400 - 600 System Default - 500
Timer 5 – Sending **SIB** (`t5` parameter)	80 - 120 System Default - 100
Timer 6 – Remote congestion (`t6` parameter)	3000 - 6000 System Default - 5000
Timer 7 – Excessive delay of acknowledgment (`t7` parameter)	500 - 2000 System Default - 800

Table 3-21 Level 2 Timer Values - Unchannelized T1 High-Speed Signaling Links

Level 2 Timers	Level 2 Timer Sets 31- 35 (in milliseconds)
Timer 1 – Aligned ready (`t1` parameter)	16000 - 151000 System Default - 151000
Timer 2 – Not aligned (`t2` parameter)	5000 - 14000 System Default - 14000
Timer 3 – Aligned (`t3` parameter)	5000 - 14000 System Default - 14000
Timer 4 – Normal proving period (`t4npp` parameter)	3000 - 30000 System Default - 30000
Timer 4 – Emergency proving period (`t4epp` parameter)	3000 - 10000 System Default - 3000
Timer 5 – Sending **SIB** (`t5` parameter)	80 - 120 System Default - 80
Timer 6 – Remote congestion (`t6` parameter)	3000 - 6000 System Default - 3000
Timer 7 – Excessive delay of acknowledgment (`t7` parameter)	500 - 2000 System Default - 500

The examples in this procedure are used to change the values of the level 2 timer set number 2.

1. Display the values of the level 2 timer set you wish to change.

   Use the `rtrv-l2t` command, specifying the level 2 timer set to be changed. For this example, enter this command.

   ```
   rtrv-l2t:l2tset=2
   ```

> **Note:**
>
> Timer sets are individual sets of timer configurations; each link is assigned one of these timer sets. This allows different links to have different level 2 timer settings. This is an example of the possible output.

```
rlghncxa03w 06-10-07 08:39:46 GMT  EAGLE5 39.0.0
L2T TIMERS (IN SECONDS)
L2TSET T1     T2    T3    T4NPP  T4EPP  T5   T6    T7    NODATA
2      10.0   20.0  20.0  5.0    1.00   0.50 10.0  3.0   0.10
```

2. Change the values of the level 2 timer in this set using the `chg-l2t` command.

   Refer to these tables for the values that can be used with the `chg-l2t` command. For this example, the values of the level 2 timer set number 2 that are being changed are T2 and T6. To change these two values, enter this command.

   - Table 3-17
   - Table 3-18
   - Table 3-19
   - Table 3-20
   - Table 3-21

   `chg-l2t:l2tset=2:t2=15000:t6=5000:nodata=200`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:39:36 GMT  EAGLE5 36.0.0
CHG-L2T: MASP A - COMPLTD
```

> **Caution:**
>
> If the `nodata` parameter value is greater than 200 milliseconds, this message appears.
> WARNING: If NODATA timer value is greater than 200 ms, links could go into congestion before link failure is declared.

3. Verify the changes using the `rtrv-l2t` command, specifying the level 2 timer set that has been changed.

   For this example, enter this command.

   `rtrv-l2t:l2tset=2`

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 08:39:46 GMT  EAGLE5 39.0.0
L2T TIMERS (IN SECONDS)
```

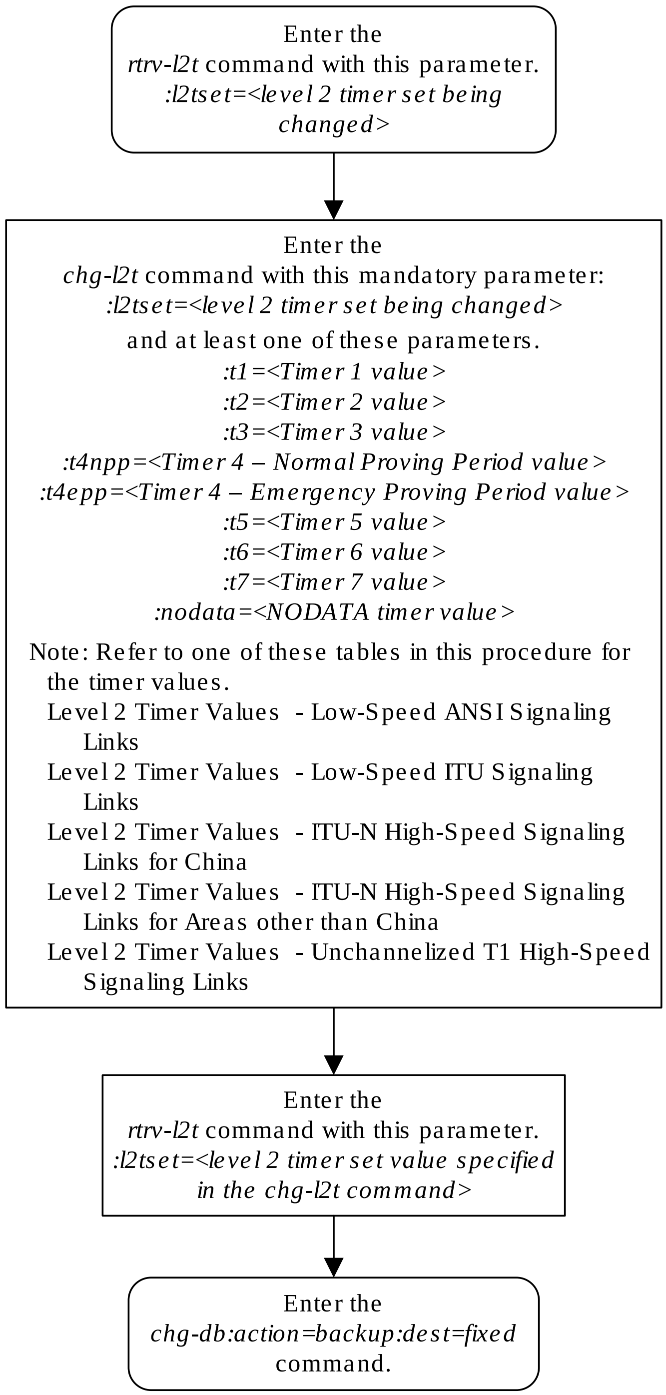
```
L2TSET T1     T2     T3     T4NPP  T4EPP  T5    T6    T7     NODATA
2      10.0   15.0   20.0   5.0    1.00   0.50  5.0   3.0    0.20
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-23 Changing Level 2 Timers



3.26 Changing Level 3 Timers

This procedure is used to change the values of the level 3 timers using the `chg-l3t` command. The level 3 timers apply to both **ANSI** and **ITU** linksets, except as noted for the specific timer.

> **Note:**
>
> Only one level 3 timer set exists.

The level 3 timers are defined as follows:

`:t1` – Timer 1 – Delay to avoid message mis-sequencing on changeover. Values - 100-2000 milliseconds; system default value - 800 milliseconds.

`:t2` – Timer 2 – Waiting for changeover acknowledgment. Values - 100-3000 milliseconds; system default value - 1400 milliseconds.

`:t3` – Timer 3 – Time controlled diversion – delay to avoid mis-sequencing on changeback. Values - 100 - 2000 milliseconds; system default value - 800 milliseconds.

`:t4` – Timer 4 – Waiting for changeback acknowledgment (1st attempt). Values - 100-2000 milliseconds; system default value - 800 milliseconds.

`:t5` – Timer 5 – Waiting for changeback acknowledgment (2nd attempt). Values - 100-2000 milliseconds; system default value - 800 milliseconds.

`:t6` – Timer 6 – Delay to avoid message mis-sequencing on controlled rerouting. Values - 100-2000 milliseconds; system default values - 800 milliseconds. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, it is recommended that the value for this timer is set to 100 milliseconds. Enter the `rtrv-ctrl-feat:partnum=893019801` command to verify the status of the 6-Way Loadsharing on Routesets feature.

`:t7` – Timer 7 – Waiting for signaling data link connection acknowledgment. Values - 100-3000 milliseconds; system default value - 1000 milliseconds.

`:t8` – Timer 8 – Transfer-prohibited (**TFP**) inhibited timer (transient solution). Values - 500-2000 milliseconds; system default value - 800 milliseconds.

`:t10` – Timer 10 – Waiting to repeat signaling-route-set-test (**SRST**) message. Values - 20000-90000 milliseconds; system default value - 30000 milliseconds.

`:t11` – Timer 11 – Transfer-restricted timer. Values - 1000-90000 milliseconds; system default - 30000 milliseconds.

`:t12` – Timer 12 – Waiting for uninhibit acknowledgment. Values - 100-2000 milliseconds; system default value - 800 milliseconds.

`:t13` – Timer 13 – Waiting for force uninhibit. Values - 100-2000 milliseconds; system default value - 800 milliseconds.

`:t14` – Timer 14 – Waiting for inhibition acknowledgment. Values - 200-4000 milliseconds; system default value - 2000 milliseconds.

`:t15` – Timer 15 – Waiting to repeat signaling route set congestion test (**RSCT**). Values - 200-4000 milliseconds; system default value - 3000 milliseconds.

`:t16` – Timer 16 – Waiting for route set congestion (**RSC**) status update. Values - 200-3000 milliseconds; system default value - 1400 milliseconds.

`:t17` – Timer 17 – Delay to avoid oscillation of initial alignment failure and link restart. Values - 500-2000 milliseconds; system default value - 800 milliseconds.

`:t18` – Timer 18 – **ANSI** linksets – Repeat **TFR** once by response method. Values - 2000-20000 milliseconds; system default value - 10000 milliseconds.

`:it18` – Timer 18 – **ITU** linksets – Timer within a signaling point whose **MTP** restarts to supervise the receipt of routing information and activation of the link and linkset. Values - 19000-50000 milliseconds; system default value - 50000 milliseconds.

`:t19` – Timer 19 – **ANSI** linksets – Failed link craft referral timer. Values - 30000-600000 milliseconds; system default value - 480000 milliseconds.

`:it19` – Timer 19 – **ITU** linksets – Supervision timer during **MTP** restart to avoid ping of **TFP**, **TFR1**, and **TRA** messages. Values - 67000-69000 milliseconds; system default value - 67000 milliseconds.

`:t20` – Timer 20 – **ANSI** linksets – Waiting to repeat local inhibit test. The value of the `t20` parameter overwrites the value of the `it22` parameter. Values - 90000-120000 milliseconds; system default value - 90000 milliseconds.

`:it20` – Timer 20 – **ITU** linksets – Overall **MTP** restart timer at the signaling point whose **MTP** restarts. Values - 59000-61000 milliseconds; system default value - 59000 milliseconds.

`:it20` – Timer 20 – **ITU** linksets – Waiting to repeat local inhibit test (`it22` parameter). Values - 59000-61000 milliseconds; system default value - 59000 milliseconds.

`:t21` – Timer 21 – **ANSI** linksets – Waiting to repeat remote inhibit test. The value of the `t21` parameter overwrites the value of the `it23` parameter. Values - 90000-120000 milliseconds; system default value - 90000 milliseconds.

`:it21` – Timer 21 – **ITU** linksets – Overall **MTP** restart timer at a signaling point adjacent to one whose **MTP** restarts. Values - 63000-65000 milliseconds; system default value - 63000 milliseconds.

`:t22` – Timer 22 – **ANSI** linksets – the amount of time the restarting node waits for the signaling links to become available. This parameter is used when the **MTP** restart feature is turned on. Values - 10000-60000 milliseconds; system default value - 10000 milliseconds.

`:it22` – Timer 22 – **ITU** linksets – Waiting to repeat local inhibit test. The value of the `it22` parameter overwrites the value of the `t20` parameter. Values - 180000-360000 milliseconds; system default value - 90000 milliseconds.

`:t23` – Timer 23 – **ANSI** linksets – the amount of time the restarting node waits to receive the **TRA** message. This parameter is used when the **MTP** restart feature is turned on. Values - 9000-100000 milliseconds; system default value - 10000 milliseconds.

`:it23` – Timer 23 – **ITU** linksets – Waiting to repeat remote inhibit test. The value of the **i**`t23` parameter overwrites the value of the `t21` parameter. Values - 180000-360000 milliseconds; system default value - 90000 milliseconds.

`:t24` – Timer 24 – **ANSI** linksets – the amount of time the restarting node waits to broadcast all **TRA** messages. This parameter is used when the **MTP** restart feature is turned on. Values - 9000-60000 milliseconds; system default value - 10000 milliseconds.

`:t25` – Timer 25 – **ANSI** linksets – the amount of time the adjacent node waits for the **TRA** message. This parameter is used when the **MTP** restart feature is turned on. Values - 30000-35000 milliseconds; system default value - 30000 milliseconds.

`:t26` – Timer 26 – **ANSI** linksets – the amount of time the restarting node waits to repeat the **TRW** message. This parameter is used when the **MTP** restart feature is turned on. Values - 12000-15000 milliseconds; system default value - 12000 milliseconds.

`:t28` – Timer 28 – **ANSI** linksets – the amount of time the adjacent node waits for the **TRW** message. This parameter is used when the **MTP** restart feature is turned on. Values - 3000-35000 milliseconds; system default value - 3000 milliseconds.

`:t29` – Timer 29 – **ANSI** linksets – this timer is started when a **TRA** message is sent in response to an unexpected **TRA**/**TRW** message or when the **MTP** restart process has completed. Any **TRA**/**TRW** messages received while the T29 timer is running are ignored. This parameter is used when the **MTP** restart feature is turned on. Values - 60000-65000 milliseconds; system default value - 60000 milliseconds.

`:t30` – Timer 30 – **ANSI** linksets – the amount of time between sending **TFPs**/**TFRs** in response to an unexpected **TRA**/**TRW** message. This parameter is used when the **MTP** restart feature is turned on. Values - 30000-35000 milliseconds; system default values - 30000 milliseconds.

`:t31` – Timer 31 – **ANSI** linksets – False link congestion detection timer. Values - 10000-120000 milliseconds; system default value - 60000 milliseconds.

`:t32` –Timer 32 – **Link** oscillation timer - Procedure A. Values - 60000-120000 milliseconds; system default values - 60000 milliseconds.

It is possible that a problem on a signaling link can cause one signaling link in a linkset to go into congestion, even though the traffic on the linkset is not high enough to cause congestion. For example, if a link has a large number of retransmissions, the throughput of the signaling link could drop enough to cause congestion on that signaling link. To help prevent this from happening, the **EAGLE** starts the level 3 T31 timer whenever a signaling link goes into congestion. If the signaling link remains in the same congestion state until the level 3 T31 timer expires, the signaling link is removed from service. The signaling link becomes unaligned, then the alignment procedure is started.

The congestion level that starts the level 3 T31 timer can be set to either congestion level 1 or congestion level 2 using the `chg-stpopts` command with the `mtpt31ctl` parameter. This congestion level can be verified with the `rtrv-stpopts` command and is shown in the `MTPT31CTL` field. The level 3 T31 timer is started when the signaling link reaches this congestion level or a higher level. An increase in congestion level or abatement to a lower congestion level restarts the timer. When the congestion level goes below the congestion level configured in the `chg-stpopts` command, the level 3 T31 timer is stopped. If the level 3 T31 timer expires and the signaling link's congestion level has not changed, the signaling link is restarted.

For example, if the level 3 T31 timer is set at 60 seconds and a signaling link goes into congestion level 1, the level 3 T31 timer is started. If, after 45 seconds, the signaling link's congestion increases to level 2, the timer is restarted to 60 seconds. If the signaling link remains at congestion level 2 for 60 seconds, the signaling link is taken out of service and it becomes unaligned. Then the alignment procedure is started, and the **EAGLE** attempts to realign the signaling link. The level 3 T31 timer can only be assigned to **ANSI SS7** linksets and signaling links.

The level 3 T32 timer helps to prevent a signaling link from oscillating in and out of service. When the **EAGLE** begins restoring an out of service signaling link, the **EAGLE** starts the level 3 T32 timer. If the signaling link fails again before the level 3 T32 expires, the **EAGLE** does not attempt to continue to bring the signaling link into service until the level 3 T32 timer expires. Once the level 3 T32 timer expires, the **EAGLE** attempts to restore the signaling link into service.

The level 3 T32 timer is only started after a signaling link fails, not when a signaling link is manually deactivated. When a signaling link is manually taken out of service using the `dact-slk` command, the level 3 T32 timer is stopped, if it is running. When the signaling link is brought back into service using the `act-slk` command, the level 3 T32 timer is not started. The level 3 T32 timer is not started when a new signaling link is first aligned.

The `l3tset` parameter specifies the level 3 timer set. For any level 3 timer parameters not specified with the `chg-l3t` command, the values for those parameters are not changed.

1. Display the values for the level 3 timer set using the `rtrv-l3t` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:03:12 GMT  EAGLE5 36.0.0
LEVEL 3 TIMERS (IN SECONDS)

 L3TSET   T1      T2      T3      T4      T5      T6      T7
     1    2.0     3.0     2.0     2.0     2.0     2.0     3.0

          T8      T9      T10     T11     T12     T13     T14
          2.0     --     90.0    90.0     2.0     2.0     4.0

          T15     T16     T17     T18     IT18    T19     IT19
          4.0     3.0     2.0    20.0     19.0   600.0    67.0

       T20/IT22  IT20   T21/IT23 IT21      T22     T23     T24
        120.0    59.0   120.0    63.0    10.0     10.0    10.0

          T25     T26     T27     T28      T29     T30     T31
         30.0    12.0     --      3.0     60.0    30.0    60.0

          T32
         60.0
```

2. Change the values of the level 3 timer set using the `chg-l3t` command.

   For this example, the level 3 timer values that are being changed are T10, T11, T19, T20, and T21. To change these timer values, enter this command.

   `chg-l3t:l3tset=1:t10=40000:t11=50000t19=480000:t20=100000:t21=100000`

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:41:51 GMT  EAGLE5 36.0.0
CHG-L3T: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-l3t` command.

   This is an example of the possible output.

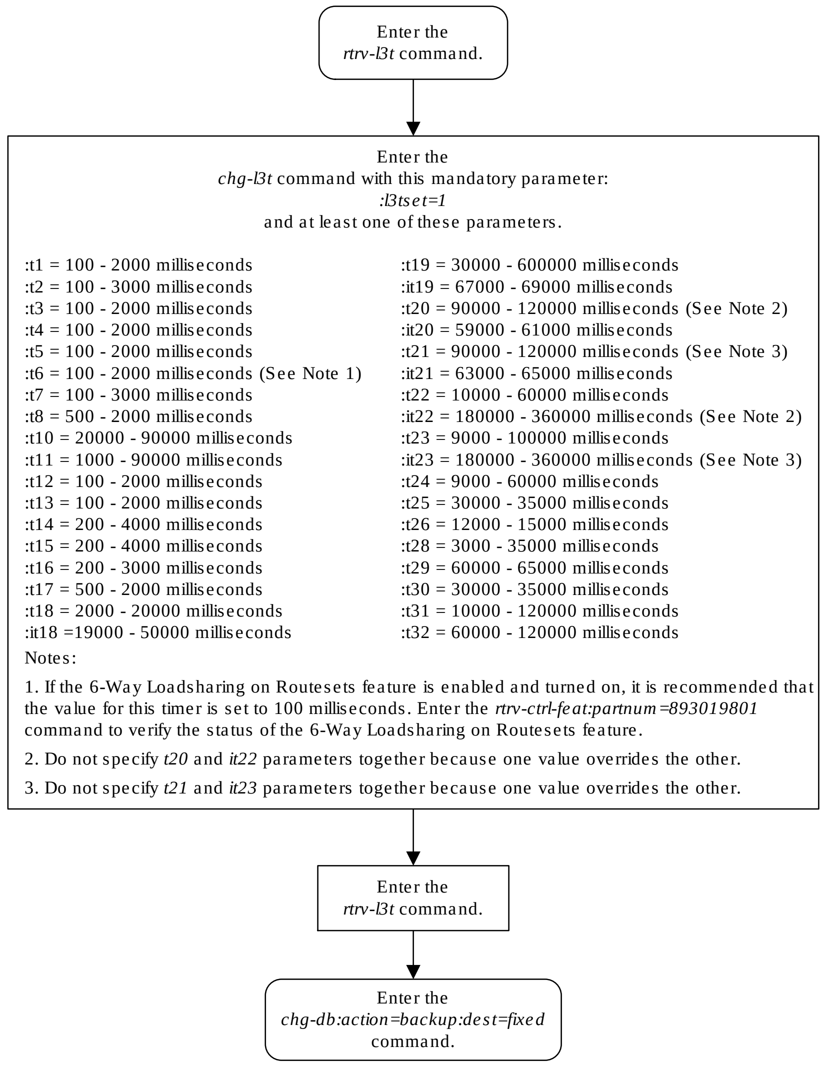
```
rlghncxa03w 06-10-17 16:03:12 GMT  EAGLE5 36.0.0
LEVEL 3 TIMERS (IN SECONDS)

 L3TSET    T1       T2       T3       T4       T5       T6       T7
     1     2.0      3.0      2.0      2.0      2.0      2.0      3.0

           T8       T9       T10      T11      T12      T13      T14
           2.0      --      40.0     50.0      2.0      2.0      4.0

           T15      T16      T17      T18      IT18     T19      IT19
           4.0      3.0      2.0     20.0      19.0    480.0     67.0

        T20/IT22  IT20     T21/IT23 IT21      T22      T23      T24
         100.0    59.0     100.0    63.0     10.0      10.0     10.0

           T25      T26      T27      T28      T29      T30      T31
          30.0     12.0     --        3.0     60.0     30.0     60.0

           T32
          60.0
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-24 Changing Level 3 Timers



3.27 Changing a Signaling Link Test Message

This procedure is used to change an **SLTM** (signaling link test message) using the `chg-slt` command.

The `chg-slt` command uses these parameters.

`:sltset` – The signaling link test message record number in the **SLTM** table.

`:t1` – The **T1** timer for repeating the **SLTM** after a failure

`:t2` – The T2 timer for the **SLTM** period

`:enabled` – Enables the signaling link test message.

`:mode` – The **SLTM** mode to be used when sending test messages.

`:pattern` – The test pattern to be sent with a signaling link test message.

1. Display the **SLTM** record to be changed using the `rtrv-slt` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-07 00:21:24 GMT  EAGLE5 36.0.0
SLTM PARAMETERS
SLTSET  T1   T2   MODE    ENABLED PATTERN
1       9.0  60.0 SPECIAL ON      AA2233445566778899AABBCCDDEEFF
2       12.0 30.0 SPECIAL OFF     F01234BCDE
3       4.0  50.0 REGULAR ON      CC2233445566778899AABBCCDDEEFF
4       6.0  90.0 SPECIAL OFF     BB23446789BCABEFG
5       6.0  90.0 SPECIAL OFF     BB23446789BCABEFG
6       6.0  90.0 SPECIAL OFF     BB23446789BCABEFG
7       6.0  90.0 SPECIAL OFF     BB23446789BCABEFG
8       6.0  90.0 SPECIAL OFF     BB23446789BCABEFG
9       6.0  90.0 REGULAR OFF     BB23446789BCABEFG
10      6.0  90.0 REGULAR OFF     BB23446789BCABEFG
11      6.0  90.0 REGULAR OFF     BB23446789BCABEFG
12      4.0  50.0 SPECIAL ON      FFEEDDCCBBAA998877665544332211
13      4.0  50.0 SPECIAL ON      EE22334455
14      6.0  90.0 SPECIAL ON      AABBCCDD
15      6.0  90.0 REGULAR ON      AABBCCDD
16      6.0  90.0 REGULAR ON      AABBCCDD
17      6.0  90.0 REGULAR ON      AABBCCDD
18      6.0  90.0 SPECIAL ON      AABBCCDD
19      6.0  90.0 SPECIAL ON      AABBCCDD
20      6.0  90.0 SPECIAL ON      AABBCCDD
```

2. Change the **SLTM** record using the `chg-slt` command.

   For this example, signaling link test message 2 is being changed to these values:

   T1 = 10.0

   T2 = 50.0

   MODE = **REGULAR**

   ENABLED = **ON**

   PATTERN = **AB987654321**

   To make these changes, enter this command.

```
chg-
slt:sltset=2:t1=10.0:t2=50.0:mode=regular:enabled=on :pattern=ab9
87654321
```

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-SLT: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-slt` command, specifying the **SLTM** record.

   This is an example of the possible output.

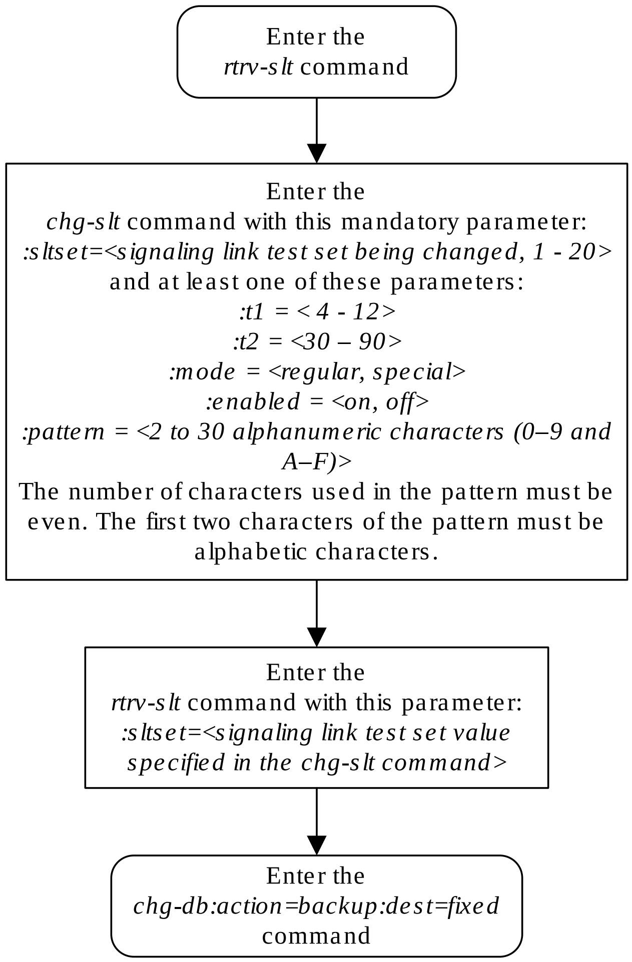
```
rlghncxa03w 06-10-07 00:23:35 GMT  EAGLE5 36.0.0
SLTM PARAMETERS
SLTSET  T1   T2   MODE    ENABLED PATTERN
2       10.0 50.0 REGULAR ON      AB987654321
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-25 Changing a Signaling Link Test Message



3.28 Configuring Circular Route Detection

> **Note:**
>
> Circular route detection is not supported in **ITU** networks.

This procedure is used to configure the EAGLE to detect circular routing with the `chg-stpopts` command. The `chg-stpopts` command uses these parameters to detect circular routing in the EAGLE.

`:on=mtplti` - to turn on the circular routing detection feature.

`:off=mtplti` - to turn off the circular routing detection feature.

`:mtpltctdpcq` – the number of **DPC**s that the circular route test message is sent to.

`:mtpltst` – the duration of the circular route test detection procedures, in milliseconds (the **MTPLTST** timer).

These parameters are optional. For any parameters not specified with the `chg-stpopts` command, the values for these parameters are not changed.

When the `on=mtplti` parameter is specified for the `chg-stpopts` command, the value `yes` is shown in the `MTPLTI` field of the `rtrv-stpopts` output. When the `off=mtplti` parameter is specified for the `chg-stpopts` command, the value `no` is shown in the `MTPLTI` field of the `rtrv-stpopts` output.

The system default values, shown in the `rtrv-stpopts` output, for these parameters are:

- MTPLTI - yes
- MTPLTCTDPCQ - 3
- MTPLTST - 10000.

For this example, the circular route detection procedures remain enabled, the number of most frequently occurring DPCs is changed from 3 to 6, and the duration of the circular route detection procedures is changed from 10000 milliseconds to 18000 milliseconds.

The EAGLE automatically tests for circular routing when congestion occurs on an **ANSI** signaling link. The circular route detection test cannot be performed for **ITU** signaling links. If the routing data is configured incorrectly, or is corrupted, MSUs could be routed in an endless circular route. The incorrect routing data could be on the EAGLE or at a remote node. With the addition of cluster routing and E links, the danger of circular routing is greater.

The EAGLE starts the test when a signaling link reaches onset congestion threshold 1. The EAGLE only runs the test for one signaling link per linkset. If a second signaling link in the same linkset goes into congestion, the EAGLE does not start a new test. Each time the signaling link's congestion level increases, the test is restarted. The **LIM** that contains the congested signaling link determines which DPCs have the most MSUs transmitted on the signaling link. The LIM then transmits a circular routing test message to the DPCs that have sent the most MSUs. The number of DPCs that the circular route test message is sent to is from 3 to 10. A circular routing test message is a routeset congestion test message with priority of 3.

If any LIM receives one of the test messages before the **MTPLTST** timer expires, the EAGLE performs these actions.

- Marks the destination as prohibited due to circular routing.
- Broadcasts **TFP**s for the destination.
- Reports that circular routing was detected for the destination.
- Raises a critical alarm.

The destination remains prohibited until it is manually allowed using the `rst-dstn` (reset destination) command.

If the destination is a cluster point code entry in the routing table, then an exception list (x-list) entry is created for the destination. If the cluster has the exception list exclusion indicator set to yes (meaning do not create x-lists for that cluster), then an x-list is not created, an **UAM** is generated, and a critical alarm is raised for the cluster. The critical alarm can be cleared by entering the `rst-dstn` command for the cluster.

If an x-list entry needs to be created, but the provisioned number of x-lists are already used, extra buffer space, equal to 100 entries in the routing table, is used to create the x-list. If this extra buffer space is also full, no x-list is created, a UAM is generated, and a critical alarm is raised for the cluster.

When a point code is prohibited due to circular routing, the EAGLE ignores **TFx**/**TCx** management messages for that point code. The EAGLE does not send routeset test messages for the point code. The EAGLE discards any MSUs received for the point code and sends response method **TFP**s or **TCP**s.

When EAGLE detects circular routing for a destination, it sets the circular routing flag for the destination in the routing table. The `rst-dstn` command clears this flag. Once the circular routing flag is cleared, the status of the destination depends on what type of entry is used.

- If the destination is a member of a cluster for which EAGLE performs full point code routing only, all routes to the destination are marked as allowed and the destination’s status is allowed. The EAGLE broadcasts TFAs for the destination.
- If the destination has a full point code entry in the routing table, and there is also an entry for the point code’s cluster, then each route used by the point code that is also used by the cluster entry assumes the status of the route for the cluster entry. Each route used by the point code that is not used by the cluster assumes the status of the cluster’s route set. The EAGLE then determines the point codes route set status and broadcasts **TFA**/**TFR** if the point code becomes allowed or restricted.

If the `rst-dstn` command is entered for an x-list entry with the circular routing flag set, the x-list entry is deleted. The point code’s status becomes the same as the cluster entry’s status.

If Circular Route Auto-Recovery is enabled and turned on, and circular routing because of far-end loopback is detected, the status of the destination marked as prohibited is automatically cleared. Refer to the Activating the Circular Route Auto-Recovery Feature procedure for more information.

1. Display the existing values for the circular route test parameters by entering the `rtrv-stpopts` command.

The value for the circular route test parameters is shown in the `MTPLTI`, `MTPLTCTDPCQ`, `MTPLTST` fields. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPLTI              no
MTPLTCTDPCQ          3
MTPLTST          10000
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

2. Change the circular routing detection parameters by entering the `chg-stpopts` command with at least one of these parameters..
   - `on=mtplti` - if the current `MTPLTI` value is `no`.
   - `off=mtplti` - if the current `MTPLTI` value is `yes`.
   - `mtpltctdpcq`
   - `mtpltst`

   For this example, enter this command.

   `chg-stpopts:mtpltctdpcq=6:mtpltst=18000:on=mtplti`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-stpopts` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPLTI             yes
MTPLTCTDPCQ          6
MTPLTST          18000
```

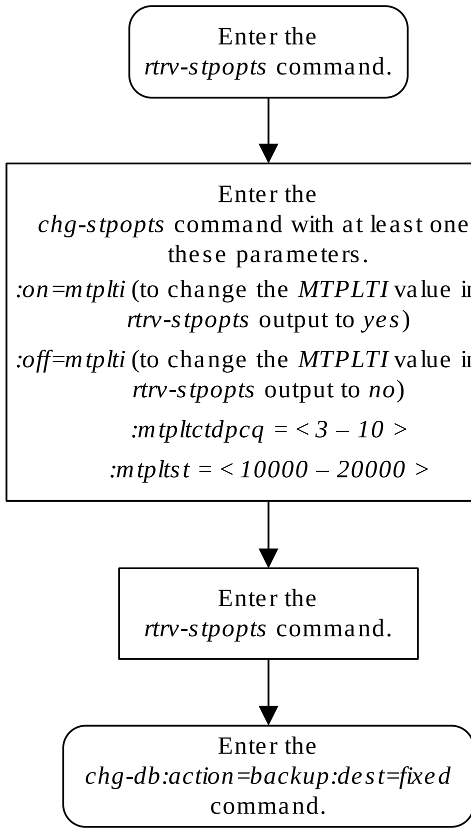
> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-26 Configuring Circular Route Detection



3.29 Configuring the TFA/TFR Pacing Rate

> **Note:**
>
> The pacing rate feature is not supported in **ITU** networks.

This procedure is used to configure the rate that the **EAGLE** sends the **TFR** and **TFA** messages, or the pacing rate. The pacing rate is configured with the `tfatfrpr` parameter of the `chg-stpopts` command. The value of the `tfatfrpr` parameter is from 0 to 1 second and can be set in 0.1 second intervals. When the `chg-stpopts` command is first introduced to the **EAGLE**, the default value for the `tfatfrpr` parameter is 1 second. A value of 0 for the `tfatfrpr` parameter indicates that the pacing should stop. The pacing of **TFR**/**TCR** is stopped and all remaining **TFR**/**TCR** are broadcast at once if the current alternate route used to route traffic to the affected point code is in danger of congestion. The value of the `tfatfrpr` parameter in the `chg-stpopts` command is entered and displayed in the `rtrv-stpopts` command output in milliseconds.

For this example, the **TFA**/**TFR** pacing rate is changed from 1 second to 0.5 seconds (1000 milliseconds to 500 milliseconds).

When the status of the route is changed to allowed (when the route was restricted) or restricted (when the route was prohibited), a burst of rerouted traffic can occur on that route, thus congesting the route. To help keep this from happening, the **EAGLE** can control the rate that it broadcasts **TFR** and **TFA** messages to adjacent signaling points. This can regulate the amount of traffic the adjacent signaling points can send to the **EAGLE** when the route becomes allowed or restricted.

The **TFA**/**TCA** and **TFR**/**TCR** messages for each affected point code are sent in groups of 20%. For each time period defined by the pacing rate, a group of 20% of the messages that are to be sent to the adjacent signaling points are broadcast to those signaling points.

This feature applies only to **ANSI** signaling links. The pacing is not done toward **ITU** networks.

If the destination becomes inaccessible or accessible before all of the **TFR**/**TCR** messages are broadcasted, then the remaining **TFR**/**TCR** messages are not sent.

TFA/**TFC** messages for multiple affected destinations are sent in parallel.

1. Display the existing values for the **TFA**/**TFR** pacing rate parameter by entering the `rtrv-stpopts` command. The value for the **TFA**/**TFR** pacing rate parameter is shown in the `TFATFRPR` field, and is shown in milliseconds. This is an example of the possible output.

   ```
   rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
   STP OPTIONS
   -----------------------
   TFATFRPR          1000
   ```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

2. Change the **TFA/TFR** pacing rate parameter. For this example, enter this command.

   `chg-stpopts:tfatfrpr=500`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-stpopts` command. This is an example of the possible output.

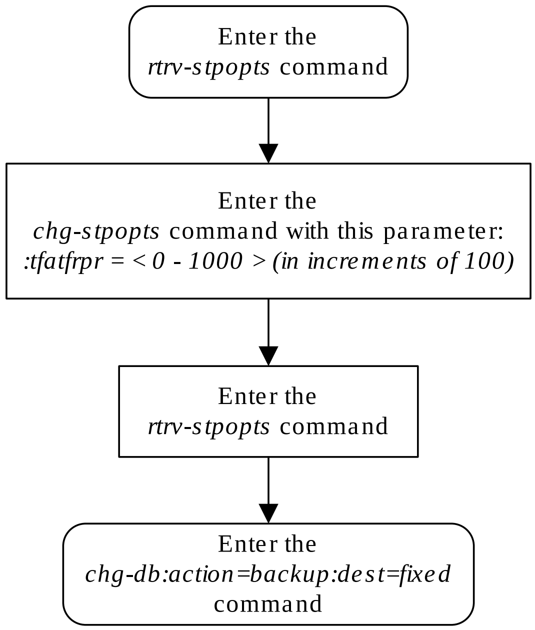
```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
TFATFRPR           500
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-27 Configuring the TFA/TFR Pacing Rate



3.30 Configuring the Frequency of RST Messages on Low Priority Routes

This procedure is used to configure the frequency that signaling-route-set-test messages are sent for routes of lower priority than the current route. The frequency is configured with these parameters of the `chg-stpopts` command.

`:on=mtplprst` - to turn on the routeset test message for lower priority routes capability. The EAGLE sends routeset test messages at intervals specified by the value of the `mtpt10alt` parameter.

`:off=mtplprst` - to turn off the routeset test message for lower priority routes capability. The EAGLE does not send routeset test messages for the lower priority routes.

`:mtpt10alt` – the timer to control the frequency that the routeset test messages are sent. The values for this parameter are from 20000 to 10,000,000 milliseconds (20 - 10,000 seconds).

The value of the `mtpt10alt` parameter must be equal to or greater than the value of the level 3 T10 timer.

When the `on=mtplprst` parameter is specified for the `chg-stpopts` command, the value `yes` is shown in the `MTPLPRST` field of the `rtrv-stpopts` output. When the `off=mtplprst` parameter is specified for the `chg-stpopts` command, the value `no` is shown in the `MTPLPRST` field of the `rtrv-stpopts` output.

The system default values, shown in the `rtrv-stpopts` output, for these parameters are:

- MTPLPRST - yes
- MTPT10ALT - equal to the value of the level 3 T10 timer. The value of the level 3 T10 timer is shown in the `T10` field of the `rtrv-l3t` command output

If the Origin-Based MTP Routing feature is enabled and turned on, the `off=mtplprst` parameter cannot be specified with the `chg-stpopts` command. The status of the Origin-Based MTP Routing feature is shown in the `rtrv-ctrl-feat` command output.

These parameters of the `chg-stpopts` command are optional. For any parameters not specified with the `chg-stpopts` command, the values for these parameters are not changed.

For this example, the sending the signaling-route-set-test messages for the low priority routes is turned on, and the frequency of sending these messages is changed from 30,000 milliseconds to 120,000 milliseconds (30 seconds to 120 seconds).

1. Display the current `MTPLPRST` and `MTPT10ALT` values by entering the `rtrv-stpopts` command.

   The `MTPT10ALT` value is shown in milliseconds.This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
```

```
MTPLPRST            no
MTPT10ALT        30000
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

If the `MTPLPRST` value is not being changed, or if the `MTPLPRST` value is being changed from `no` to `yes`, continue the procedure with 3.

If the `MTPLPRST` value is being changed from `yes` to `no`, continue the procedure with 2.

2. Display the status of the Origin-Based **MTP** Routing feature by entering this command.

   `rtrv-ctrl-feat:partnum=893014201`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
MTP Origin-Based Routing  893014201 off     ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the Origin-Based MTP Routing feature is enabled and turned on, shown with entry `on` in the `Status` column, the `MTPLPRST` value cannot be changed to `no`.

3. Display the values for the level 3 timer set using the `rtrv-l3t` command.

   The values of the level 3 timers are shown in seconds. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:03:12 GMT  EAGLE5 36.0.0
LEVEL 3 TIMERS (IN SECONDS)

 L3TSET   T1      T2      T3      T4      T5      T6      T7
```

```
      1     2.0      3.0      2.0      2.0      2.0      2.0      3.0

            T8       T9       T10      T11      T12      T13      T14
            2.0      --       90.0     90.0     2.0      2.0      4.0

            T15      T16      T17      T18      IT18     T19      IT19
            4.0      3.0      2.0      20.0     19.0     600.0    67.0

        T20/IT22  IT20     T21/IT23 IT21      T22      T23      T24
          120.0    59.0    120.0     63.0     10.0     10.0     10.0

            T25      T26      T27      T28      T29      T30      T31
           30.0     12.0      --       3.0     60.0     30.0     60.0

            T32
           60.0
```

4. Change the `MTPLPRST` or `MTPT10ALT` values by entering the `chg-stpopts` command with at least one of these parameters.
   - `on=mtplprst` - if the current `MTPLPRST` value is `no`.
   - `off=mtplprst` - if the current `MTPLPRST` value is `yes`.
   - `mtpt10alt`

   For this example, enter this command.

   `chg-stpopts:on=mtplprst:mtpt10alt=120000`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

5. Verify the changes using the `rtrv-stpopts` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPLPRST           yes
MTPT10ALT       120000
```

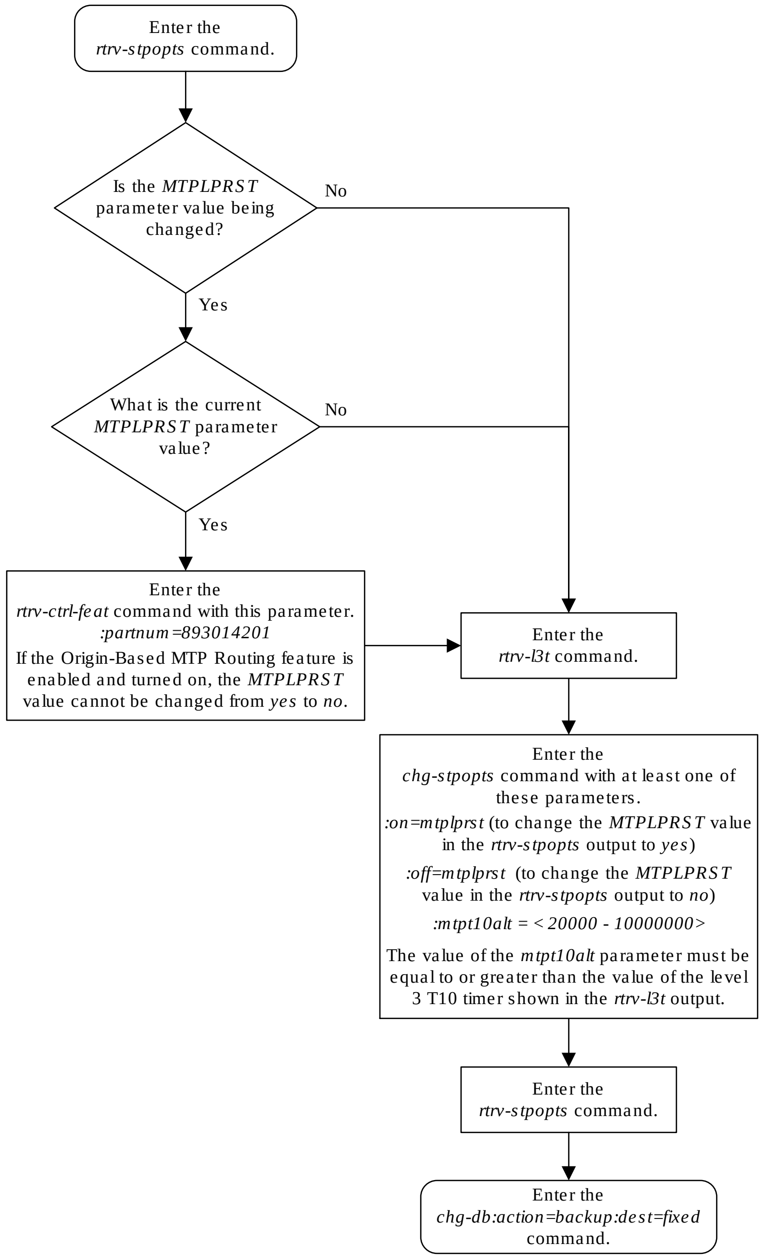
> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

6. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-28 Configuring the Frequency of RST Messages on Low Priority Routes



3.31 Adding Remote Loopback Points

This procedure is used to add remote loopback points to be used by the link fault sectionalization feature to the database, using the `ent-lbp` command. The `ent-lbp` command uses these parameters.

:`loc` – The card location of the signaling link to be tested.

:`link` – The signaling link on the card specified in the `loc` parameter to be tested.

:`lbp` – Identifies the far-end loopback point that lies along a **SS7** signaling link path between the **EAGLE** up to and including the target device.

:`clli` – The **CLLI** code or other mnemonic identifier used to describe the specified loopback point.

:`rle` – The remote link element to be looped back for testing.

:`rep` – The number of link elements of the same type, not including the target device, that lies between the **EAGLE** and the link element to be tested.

:`lfst` – The type of link fault sectionalization loopback test to be performed.

To add remote loopback points to the database, the link fault sectionalization feature must be turned on.

The **DS0** and network element interface (**NEI**) link elements do not support non-latching loopbacks

If the remote link element to be tested is a network element interface (**NEI**), the value of the `rep` parameter must be zero.

The `rep` parameter can only be specified for a link fault sectionalization latching loopback test

The signaling link being tested can be assigned to one of these card types as defined by the `type` parameter of the `ent-card` command:

- `limds0` (multi-port **LIM** - P/N 870-2061-**XX**
- `limt1` (**E1**/**T1 MIM** - P/N 870-2198-**XX**, **HC MIM** - P/N 870-2671-**XX**, or **E5-E1T1** - P/N 870-1873-**XX**)
- `limch` (**E1**/**T1 MIM** - configured as a **T1** channel card - P/N 870-2198-**XX**)

Any signaling link can be selected for testing, as long as the signaling link being tested is equipped. The **LIMs** must be assigned to either the `ss7ansi` or `ccs7itu` application. Use the `rtrv-card` command to verify the card type and the application.

The specified loopback point cannot already be in the database.

The loopback point **ID** value cannot exceed a previously defined network element interface loopback point value.

Only one network element interface loopback point can be defined for each **SS7** signaling link.

A network element interface (**NEI**) loopback point must be defined as the terminating **SS7** signaling link component.

The value specified for the `rep` parameter must be greater than the value of the `rep` parameter assigned to the previous loopback point and less than any `rep` parameter values for any subsequent loopback points, if any are defined. For example, the signaling link on card 1215, link B, has 5 loopback points defined (see the `rtrv-lbp` command output in step 2). The value of the `rep` parameter used for loopback point 5 must be greater that the `rep` parameter value used for loopback point 3, and less than the `rep` parameter value used for loopback point 7.

The link fault sectionalization feature must be turned on. Verify this by entering the `rtrv-feat` command. If the link fault sectionalization feature is off, shown by the entry `LFS = off` in the output of the `rtrv-feat` command, it can be turned on by entering the `chg-feat:lfs=on` command.

> **Note:**
>
> Once the link fault sectionalization feature is turned on with the `chg-feat` command, it cannot be turned off.
> The link fault sectionalization feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the link fault sectionalization feature, contact your Oracle Sales Representative or Account Representative.

Refer to Appendix A of *Commands User's Guide* for a summary of loopback testing commands and functions.

The examples used in this procedure are based on the example network shown in Table 3-22.

Table 3-22 Loopback Point Configuration Table

SLK LOC	SLK LINK	LBP	RLE	REP	LFST
1204	B	3	**DS0**	0	**LLT**
		6	**DS0**	4	**LLT**
		9	**NEI**	0	**LLT**

Canceling the `RTRV-SLK` Command

Because the `rtrv-slk` command used in this procedure can output information for a long period of time, the `rtrv-slk` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-slk` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-slk` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-slk` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-slk` command was entered, from another terminal other that the terminal where the `rtrv-slk` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the signaling links in the database by entering the `rtrv-slk` command.

This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0

                                 L2T               PCR   PCR
LOC   LINK LSN          SLC TYPE     SET   BPS     ECM   N1    N2
1201 A     ls01          0  LIMDS0   1     56000   BASIC ---   -----
1201 B     lsa1          0  LIMDS0   1     56000   BASIC ---   -----
1202 B     ls02          0  LIMDS0   2     56000   BASIC ---   -----
1203 A     ls03          0  LIMDS0   3     56000   BASIC ---   -----
1203 B     lsa2          0  LIMDS0   1     56000   BASIC ---   -----
1204 B     ls01          1  LIMDS0   1     56000   BASIC ---   -----
1205 A     lsa3          0  LIMDS0   4     56000   BASIC ---   -----
1206 A     ls02          1  LIMDS0   2     56000   BASIC ---   -----
1207 A     lsn1207a      0  LIMDS0   1     56000   BASIC ---   -----
1207 B     lsn1207b      0  LIMDS0   1     56000   BASIC ---   -----
1208 B     ls03          1  LIMDS0   3     56000   BASIC ---   -----
1212 A     ls04          0  LIMDS0   4     56000   BASIC ---   -----
1213 B     ls05          0  LIMDS0   5     56000   BASIC ---   -----
1214 A     lsn1214a      0  LIMDS0   2     56000   BASIC ---   -----
1214 B     lsa3          1  LIMDS0   4     56000   BASIC ---   -----
1215 A     ls05          1  LIMDS0   5     56000   BASIC ---   -----
1301 B     ls06          0  LIMDS0   6     56000   BASIC ---   -----
1304 B     ls06          1  LIMDS0   6     56000   BASIC ---   -----
1308 A     ls06          2  LIMDS0   6     56000   BASIC ---   -----
1311 A     ls01          2  LIMDS0   1     56000   BASIC ---   -----
1311 A1    ls05          2  LIMDS0   5     56000   BASIC ---   -----
1311 B     ls03          2  LIMDS0   3     56000   BASIC ---   -----
1311 B1    ls07          1  LIMDS0   7     56000   BASIC ---   -----
1313 A     ls07          0  LIMDS0   7     56000   BASIC ---   -----
1315 A     lsn5          0  LIMDS0   11    56000   BASIC ---   -----
1317 A     lsi7          0  LIMDS0   11    56000   BASIC ---   -----

                                   LP             ATM
LOC   LINK LSN          SLC TYPE      SET   BPS       TSEL       VCI
VPI   LL
1302 A     atmansi0      0  LIMATM    3    1544000    EXTERNAL   35
15     0
1305 A     atmansi1      0  LIMATM    4    1544000    INTERNAL   100
20     2
1318 A     atmansi0      1  LIMATM    9    1544000    LINE       150
25     4

                                   LP
ATM                      E1ATM
LOC   LINK LSN          SLC TYPE      SET BPS     TSEL      VCI    VPI
CRC4 SI  SN
2101 A     atmitu1       0  LIME1ATM 5    2.048M LINE      150    2
ON    1   20
2105 A     atmitu1       1  LIME1ATM 5    2.048M LINE      35     15
ON    2   15

SLK table is (31 of 1200) 3% full
```

2. Display the existing loopback point values by entering the `rtrv-lbp` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE  REP CLLI
LFST
1201  A     1    DS0   0  ------------------------  LLT
            7    OCU   0  ------------------------  NLT
            9    NEI   0  ------------------------  LLT

1203  B     2    DS0   0  ------------------------  LLT
            3    DS0   4  ------------------------  LLT
            4    NEI   0  ------------------------  LLT
1207  B     1    DS0   0  ------------------------  LLT
            6    NEI   0  ------------------------  LLT
1215  A     1    DS0   0  ------------------------  LLT
            3    DS0   4  ------------------------  LLT
            5    DS0   5  ------------------------  LLT
            7    DS0   8  ------------------------  LLT
            9    NEI   0  ------------------------  LLT
```

3. Add the loopback point to the database, using the `ent-lbp` command.

   For this example, enter these commands.

   `ent-lbp:loc=1204:link=b:lbp=3:rle=ds0:rep=0:lfst=llt`

   `ent-lbp:loc=1204:link=b:lbp=6:rle=ds0:rep=4:lfst=llt`

   `ent-lbp:loc=1204:link=b:lbp=9:rle=nei:rep=0:lfst=llt`

   When each of these commands have completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
ENT-LBP: MASP A - COMPLTD
```

4. Verify the changes using the `rtrv-lbp` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE  REP CLLI                      LFST
1201  A     1    DS0   0  ------------------------  LLT
            7    OCU   0  ------------------------  NLT
            9    NEI   0  ------------------------  LLT

1203  B     2    DS0   0  ------------------------  LLT
            3    DS0   4  ------------------------  LLT
            4    NEI   0  ------------------------  LLT
1204  B     3    DS0   0  ------------------------  LLT
            6    DS0   4  ------------------------  LLT
            9    NEI   0  ------------------------  LLT
1207  B     1    DS0   0  ------------------------  LLT
            6    NEI   0  ------------------------  LLT
```

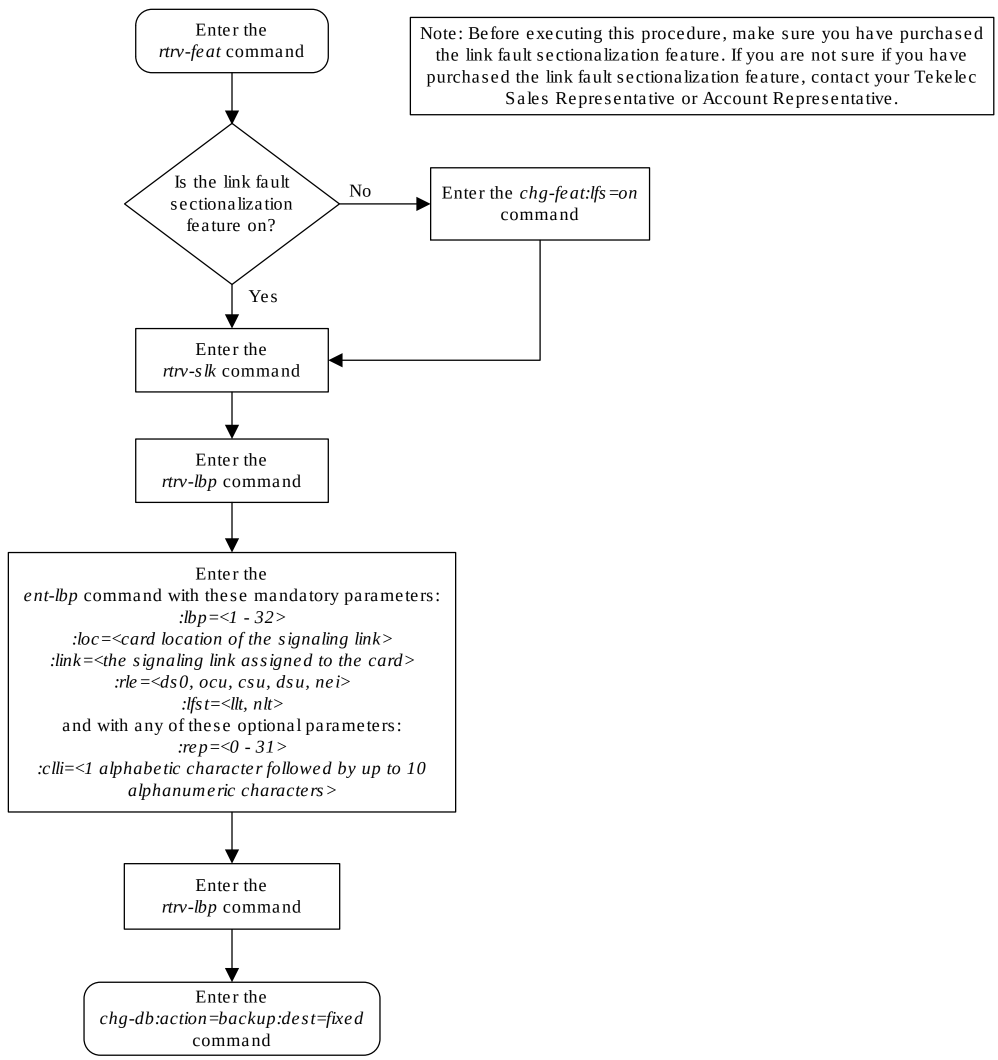
```
1215  A      1     DS0    0  ------------------------  LLT
             3     DS0    4  ------------------------  LLT
             5     DS0    5  ------------------------  LLT
             7     DS0    8  ------------------------  LLT
             9     NEI    0  ------------------------  LLT
```

5. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-29 Adding Remote Loopback Points



3.32 Removing Remote Loopback Points

This procedure is used to remove remote loopback points used by the link fault sectionalization feature from the database, using the `dlt-lbp` command. The `dlt-lbp` command uses these parameters.

:`loc` – The card location of the signaling link to be tested.

:`link` – The signaling link on the card specified in the `loc` parameter.

:`lbp` – Identifies the far-end loopback point that lies along a **SS7** signaling link path between the **EAGLE** 5 **ISS** up to and including the target device.

:`all` – Are all loopback points for the specified signaling link to be removed

The specified loopback point must be in the database.

Either the `lbp` or `all` parameters must be specified, but not both.

This examples used in this procedure are used to remove the remote loopback point 5 on the signaling link assigned to card 1215, link B.

1. Display the existing loopback point values by entering the `rtrv-lbp` command.
   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE   REP CLLI                     LFST
1201  A     1    DS0    0  ------------------------ LLT
            7    OCU    0  ------------------------ NLT
            9    NEI    0  ------------------------ LLT

1203  B     2    DS0    0  ------------------------ LLT
            3    DS0    4  ------------------------ LLT
            4    NEI    0  ------------------------ LLT

1204  B     3    DS0    0  ------------------------ LLT
            6    DS0    4  ------------------------ LLT
            9    NEI    0  ------------------------ LLT

1207  B     1    DS0    0  ------------------------ LLT
            6    NEI    0  ------------------------ LLT

1215  A     1    DS0    0  ------------------------ LLT
            3    DS0    4  ------------------------ LLT
            5    DS0    5  ------------------------ LLT
            7    DS0    8  ------------------------ LLT
            9    NEI    0  ------------------------ LLT
```

2. Remove the loopback point from the database, using the `dlt-lbp` command. For this example, enter this command.

   `dlt-lbp:loc=1215:link=b:lbp=5`

   If all the loopback points on the signaling link are to be removed from the database, enter this command.

   `dlt-lbp:loc=1215:link=b:all=yes`

   When the command has completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
DLT-LBP: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-lbp` command. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE  REP CLLI                        LFST
1201  A     1    DS0   0  ------------------------   LLT
            7    OCU   0  ------------------------   NLT
            9    NEI   0  ------------------------   LLT

1203  B     2    DS0   0  ------------------------   LLT
            3    DS0   4  ------------------------   LLT
            4    NEI   0  ------------------------   LLT

1204  B     3    DS0   0  ------------------------   LLT
            6    DS0   4  ------------------------   LLT
            9    NEI   0  ------------------------   LLT

1207  B     1    DS0   0  ------------------------   LLT
            6    NEI   0  ------------------------   LLT

1215  A     1    DS0   0  ------------------------   LLT
            3    DS0   4  ------------------------   LLT
            7    DS0   8  ------------------------   LLT
            9    NEI   0  ------------------------   LLT
```

If the `all=yes` parameter was specified in step 2, this is an example of the possible output.

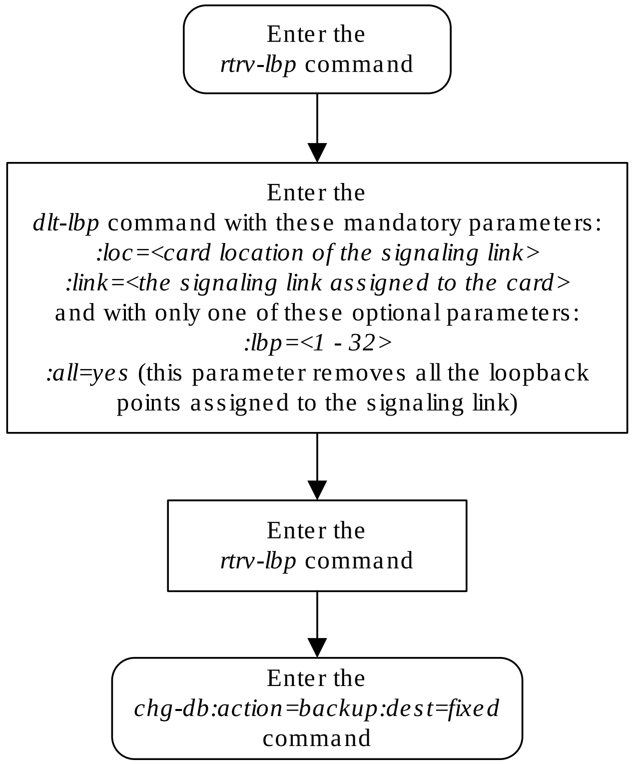
```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE  REP CLLI                        LFST
1201  A     1    DS0   0  ------------------------   LLT
            7    OCU   0  ------------------------   NLT
            9    NEI   0  ------------------------   LLT

1203  B     2    DS0   0  ------------------------   LLT
            3    DS0   4  ------------------------   LLT
            4    NEI   0  ------------------------   LLT

1204  B     3    DS0   0  ------------------------   LLT
            6    DS0   4  ------------------------   LLT
            9    NEI   0  ------------------------   LLT

1207  B     1    DS0   0  ------------------------   LLT
            6    NEI   0  ------------------------   LLT
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
```

```
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-30 Removing Remote Loopback Points



3.33 Changing Remote Loopback Points

This procedure is used to change the values of the remote loopback points to be used by the link fault sectionalization feature in the database, using the `chg-lbp` command. The `chg-lbp` command uses these parameters.

:`loc` – The card location of the signaling link to be tested.

:`link` – The signaling link on the card specified in the `loc` parameter.

:`lbp` – Identifies the far-end loopback point that lies along a **SS7** signaling link path between the **EAGLE** up to and including the target device.

:`clli` – The **CLLI** code or other mnemonic identifier used to describe the specified loopback point.

:`rle` – The remote link element to be looped back for testing.

:`rep` – The number of link elements of the same type, not including the target device, that lies between the **EAGLE** and the link element to be tested.

:`lfst` – The type of link fault sectionalization loopback test to be performed.

The **DS0** and network element interface (**NEI**) link elements do not support non-latching loopbacks.

If the remote link element to be tested is a network element interface (**NEI**), the value of the `rep` parameter must be zero.

The `rep` parameter can only be specified for a link fault sectionalization latching loopback test.

The specified loopback point must be in the database.

The loopback point **ID** value cannot exceed a previously defined network element interface loopback point value.

Only one network element interface loopback point can be defined for each **SS7** signaling link.

A network element interface (**NEI**) loopback point must be defined as the terminating **SS7** signaling link component.

The value specified for the `rep` parameter must be greater than the value of the `rep` parameter assigned to the previous loopback point and less than any `rep` parameter values for any subsequent loopback points, if any are defined. For example, the signaling link on card 1215, link B, has 5 loopback points defined (see the `rtrv-lbp` command output in step 1). The value of the `rep` parameter used for loopback point 5 must be greater that the `rep` parameter value used for loopback point 3, and less than the `rep` parameter value used for loopback point 7.

Refer to Appendix A of *Commands User's Guide* for a summary of loopback testing commands and functions.

1. Display the existing loopback point values by entering the `rtrv-lbp` command.

This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE   REP CLLI                        LFST
1201  A     1    DS0    0  ------------------------   LLT
            7    OCU    0  ------------------------   NLT
            9    NEI    0  ------------------------   LLT

1203  B     2    DS0    0  ------------------------   LLT
            3    DS0    4  ------------------------   LLT
            4    NEI    0  ------------------------   LLT
1204  B     3    DS0    0  ------------------------   LLT
            6    DS0    4  ------------------------   LLT
            9    NEI    0  ------------------------   LLT
1207  B     1    DS0    0  ------------------------   LLT
            6    NEI    0  ------------------------   LLT
1215  A     1    DS0    0  ------------------------   LLT
            3    DS0    4  ------------------------   LLT
            5    DS0    5  ------------------------   LLT
            7    DS0    8  ------------------------   LLT
            9    NEI    0  ------------------------   LLT
```

2. Change the loopback point values in the database, using the `chg-lbp` command.

   For this example, enter this command.

   `chg-lbp:loc=1204:link=b:lbp=6:rle=csu:rep=10`

   When the command has completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-LBP: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-lbp` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
LOC   LINK  LBP  RLE   REP CLLI                        LFST
1201  A     1    DS0    0  ------------------------   LLT
            7    OCU    0  ------------------------   NLT
            9    NEI    0  ------------------------   LLT

1203  B     2    DS0    0  ------------------------   LLT
            3    DS0    4  ------------------------   LLT
            4    NEI    0  ------------------------   LLT
1204  B     3    DS0    0  ------------------------   LLT
            6    CSU   10  ------------------------   LLT
            9    NEI    0  ------------------------   LLT
1207  B     1    DS0    0  ------------------------   LLT
            6    NEI    0  ------------------------   LLT
1215  A     1    DS0    0  ------------------------   LLT
            3    DS0    4  ------------------------   LLT
```

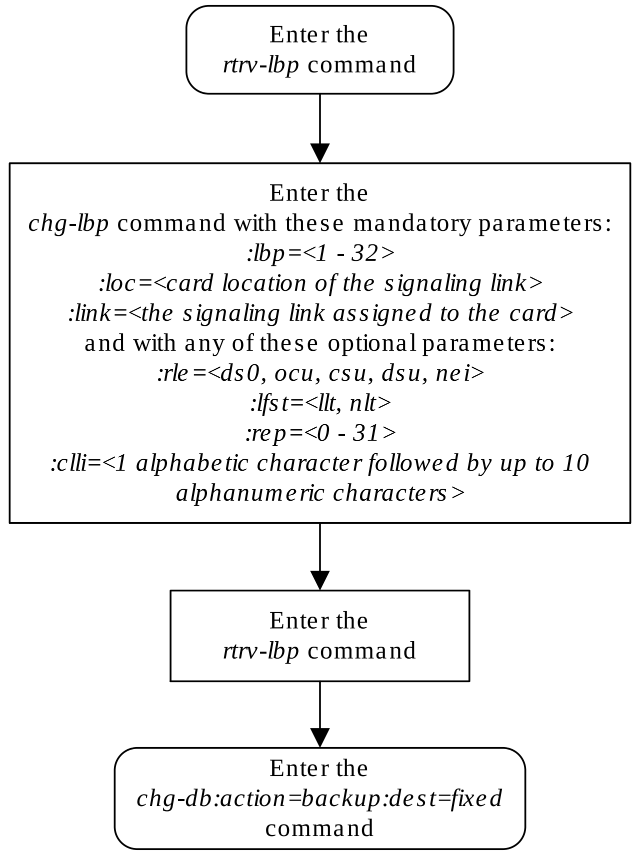
```
            5     DS0    5   ------------------------  LLT
            7     DS0    8   ------------------------  LLT
            9     NEI    0   ------------------------  LLT
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-31 Changing Remote Loopback Points



3.34 Configuring the System for Random SLS Generation

The Random **SLS** Generation feature can alleviate problems of the **EAGLE** not load-sharing between all links within a linkset. This feature is available for both ITU and ANSI traffic.

The **ITU** protocol uses a 4 bit **Signaling Link** Selection (**SLS**) field with no modification of **SLS** values by intermediate nodes and a one-to-one mapping of **SLS** values to signaling links. These rules can be overly restrictive in situations where they are not necessary.

For both ITU and ANSI, the feature allows the user to have the **EAGLE** ignore the incoming **SLS** value and randomly generate a new 8-bit **SLS** value to select an outgoing linkset and a link. For ITU only, the original 4-bit **SLS** value is not changed and is still contained in the outgoing message. The newly generated **SLS** is used for link selection only. For ANSI, the original SLS value in the outgoing MSU can be replaced with the SLS value generated by the feature. This is done by appropriately setting SS7OPTS:SLSREPLACE parameter.

Messages destined for a particular destination are randomly distributed across all the links to that destination using an internally generated random 8-bit **SLS**. This means that this feature does not follow the **ITU** protocol requiring that all messages with the same **SLS** value must use the same signaling link. Also, correct sequencing of Class 1 messages is not guaranteed. Random **SLS** generation applies to all Class 0 and Class 1 **SCCP** messages.

This feature is implemented with one of these values for the `randsls` parameter of the `chg-stpopts` command.

- `class0` – Applies the Random **SLS** feature to Class 0 **ITU SCCP** messages and associated service. For example, Random **SLS** Generation would apply to Class 0 **UDT**, **XUDT**, and **UDTS**, **XUDTS** messages. Class 1 messages would still use the standard **ITU** method for link selection.
- `all` – Applies the Random **SLS** feature to all **ITU SCCP** messages
- `off` – Turns off the Random **SLS** feature.
- `perls` – Applies the Random **SLS** feature on a specific linkset instead of applying the Random **SLS** feature system-wide. To use the randsls with ANSI, the value for randsls must be specified as perls. For more information about random **SLS** generation on a specific linkset, refer to Per-Linkset Random SLS.

> **Caution:**
>
> If the `randsls` parameter value of the `chg-stpopts` command is `all`, thus activating the Random **SLS** feature for Class 1 **ITUSCCP** messages, and the value of the `class1seq` parameter of the `chg-sccpopts` command is `on`, there is no guarantee that **UDT**/**XUDTITU** Class 1 messages are delivered to the remote node in the order in which they were received. To ensure that Class 1 **UDT**/**XUDTITU** messages are delivered to the remote node in the order in which they were received, the `randsls` parameter value should be set to either `off` or `class0` if the value of the `class1seq` parameter of the `chg-sccpopts` command is `on`.

For ITU linksets, this feature is available as a system-wide option as well as on a per-linkset basis. For ANSI linksets, this feature is available only on a per-linkset basis. The Random SLS feature is applied to incoming messages on ITU linksets as shown in Table 3-23.

Table 3-23 ITU Random SLS Rules

System-Wide RANDSLS Value (in the RTRV-STPOPTS Output)	RANDSLS Value for the Outgoing Linkset	Random SLS Action
OFF	N/A	The Random SLS feature is not applied on any ITU message.
ALL	N/A	The Random SLS feature is applied on all ITU SCCP messages.
CLASS0	N/A	The Random SLS feature is applied on all ITU SCCP CLASS0 messages.
PERLS	OFF	The Random SLS feature is not applied on any ITU message on the specified linkset.
PERLS	ALL	The Random SLS feature is applied on all ITU SCCP messages on the specified linkset.
PERLS	CLASS0	The Random SLS feature is applied on all ITU SCCP CLASS0 messages on the specified linkset.

The Random SLS feature is applied to incoming messages on ANSI linksets as shown in Table 3-24.

Table 3-24 ANSI Random SLS Rules

System-Wide RANDSLS Value (in the RTRV-STPOPTS Output)	RANDSLS Value for the Incoming Linkset	Random SLS Action
OFF	N/A	The Random SLS feature is not applied on any ANSI message.

Table 3-24 (Cont.) ANSI Random SLS Rules

System-Wide RANDSLS Value (in the RTRV-STPOPTS Output)	RANDSLS Value for the Incoming Linkset	Random SLS Action
ALL	N/A	The Random SLS feature is not applied on any ANSI message.
CLASS0	N/A	The Random SLS feature is not applied on any ANSI message.
PERLS	OFF	The Random SLS feature is not applied on any ANSI message on the specified linkset.
PERLS	ALL	The Random SLS feature is applied on ANSI SCCP and ISUP messages on the specified linkset.
PERLS	CLASS0	The Random SLS feature is applied on all ANSI SCCP CLASS0 messages on the specified linkset.

The settings for this feature are independent of the **ITU SLS** Enhancement feature settings for individual linksets. These settings are defined by the `slsocbit` (Use of the Other **CIC BIT** capability) and `slsrsb` (**SLS** Bit Rotation capability) parameters of the `ent-ls` and `chg-ls` commands. The `randsls` parameter, however, overrides the `slsrsb` parameter for **SCCP** messages. If the `randsls` parameter value is `perls`, the `randsls` parameter also overrides the `islsrsb` (SLS Bit Rotation on Incoming Linksets) parameter of the `ent-ls` and `chg-ls` commands for Class 0 SCCP messages and ISUP messages on ANSI linksets. These parameters are described in greater detail in *Commands User's Guide* and in ITU SLS Enhancement. Note that the `ent-ls` or `chg-ls` commands do not prevent the user from provisioning the `slsrsb` or `islsrsb` parameters.

With the implementation of this feature, a maximum of 16 links continues to be supported in a single linkset to a destination. However, it is now possible to have up to 32 links in a combined linkset to a destination, with a maximum of 16 links per linkset. The 32 links is a change from the current **EAGLE** maximum of only 16 links per combined linkset, which is due to **ITU** protocol restrictions. If more than 16 links are used in a combined linkset, the operator needs to be aware that a maximum of 16 links can be used by non-Random **SLS** traffic over the linkset. The non-Random **SLS** traffic continues to operate under the rules of the **ITU** protocol.

Figure 3-32 shows an example of a combined linkset from node A to nodes B and C, with 8 links per linkset. Since 8 bits allows for values 0-255 (decimal), the figure shows how these values are internally mapped to the links of the combined linkset. For ease of reading, not all values are shown.

Figure 3-32 Random SLS Mapping to a Combined Linkset

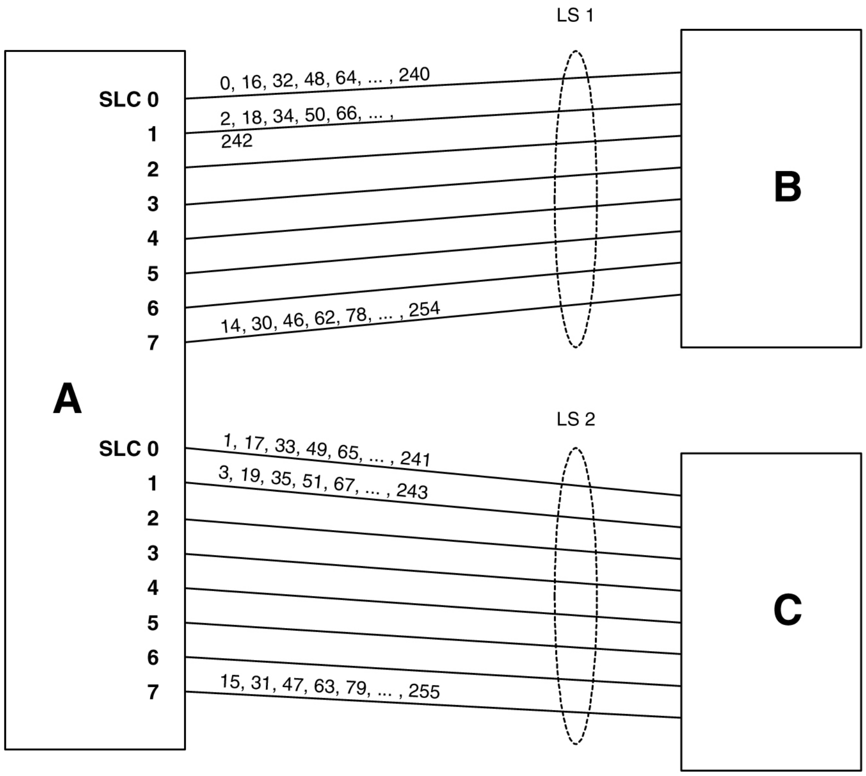
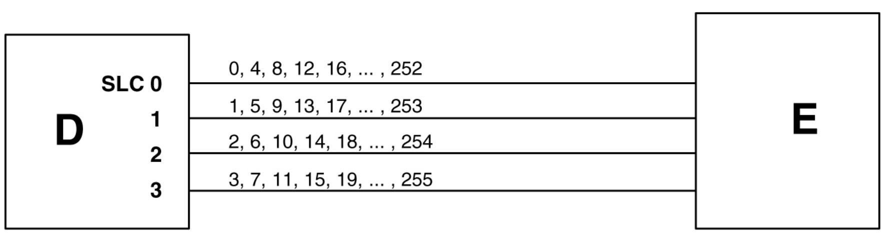


Figure 3-33 shows the mapping for a 4-link single linkset between nodes D and E. When an **MSU** is to be transmitted, a random 8 bit **SLS** is generated internally and a link is selected according to this predetermined mapping.

Figure 3-33 Random SLS Mapping to a Single Linkset



The 4 bit **SLS** in the outgoing message is equal to the **SLS** that the **EAGLE** received. There is no change to the **SLS** value in the **SS7** message.

In a non-failure condition, the process for mapping the internally generated **SLS** values to **SLC** (**Signaling Link** Code) values for specific links is as follows:

1. A “random” 8-bit **SLS** value is generated. In reality, a single table of 256 unique **SLS** values, initially generated in random order, exists in the **EAGLE**. A counter is maintained for each linkset in the **EAGLE** that causes the linkset to cycle through the random values in the table as messages are routed out on that linkset. For a combined linkset, the counter for the first linkset in the **EAGLE**'s linkset table is used.

2. For a combined linkset, the first bit is used to select the linkset and then is ignored when selecting the **SLC**. For a single linkset, the first bit is used when selecting the **SLC**. In all cases, the fifth bit is ignored when selecting the **SLC**. This is due to internal **ANSI**-based processing in the **EAGLE**.
3. The changed **SLS** value (with fifth and possibly also first bits ignored) is then divided by the number of links in the linkset (not a combined linkset) and the remainder gives the **SLC** value. For example, in Figure 3-32, the **SLS** value 78 is mapped to **SLC** 7 in linkset **LS1** as follows:
   a. The binary equivalent for decimal number 78 is 01001110.
   b. The fifth bit is ignored leaving the binary number 0101110.
   c. The least significant bit is used to select linkset **LS1** and is then ignored, leaving the binary number 010111.
   d. The decimal equivalent of the binary number 010111 is 23. When the number 23 is divided by the number of links in the linkset, in this example, eight, a remainder of seven remains, thus **SLC** 7 on linkset **LS1** is chosen for the outgoing message.

   In the example shown in Figure 3-33, the **SLS** value 78 is mapped to **SLC** 2 in **LS1** (the only linkset) as follows:
   a. The binary equivalent for decimal number 78 is 01001110.
   b. The fifth bit is ignored leaving the binary number 0101110.
   c. The decimal equivalent of the binary number 0101110 is 46. When the number 46 is divided by the number of links in the linkset, in this example, four, a remainder of two remains, thus **SLC** 2 on linkset **LS1** is chosen for the outgoing message.
      Table 3-25 shows the mapping for a combined linkset with 16 links in each linkset. This table is discussed in more detail in the next section.

Link failure scenarios

In any situation where a link is failed, **SLS** values that were mapped to that link are remapped to other links of the linkset or combined linkset. This is done in the reverse order that the **SLS** values were originally mapped to links, of course skipping the failed link. Subsequent link failures will have their **SLS** values, along with **SLS** values from the prior failures, remapped in the same way. The odd/even mapping rule for combined linksets does not apply to the remapped **SLS** values under failure conditions. This is to continue to achieve the best possible load balance across all links. No **MSUs** should be discarded in any case.

For example, Table 3-25 shows how the internal 8-bit **SLS** values are distributed for a combined linkset with 16 links per linkset. It also shows what happens when one or two of the links fail. As this example shows, the **SLS** values that are identical after the fifth bit is dropped (for example, 0 and 16, 192 and 208, etc.) are remapped to the same link. This is why in this example the 8 different **SLS** values from the first failed link are remapped to only 4 links and not 8.

Table 3-25 Failure Scenarios for a 32-Link Combined Linkset

Linkset/SLC	Normal SLS Mapping	SLS Mapping for Single Link Failure	SLS Mapping for Dual Link Failure
LS1/0	0 16 64 80 128 144 192 208	Failed	Failed

Table 3-25 (Cont.) Failure Scenarios for a 32-Link Combined Linkset

Linkset/SLC	Normal SLS Mapping	SLS Mapping for Single Link Failure	SLS Mapping for Dual Link Failure
LS1/1	2 18 66 82 130 146 194 210	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS1/7	14 30 78 94 142 158 206 222	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS1/8	32 48 96 112 160 176 224 240	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS1/9	34 50 98 114 162 178 226 242	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS1/12	40 56 104 120 168 184 232 248	Same as Normal **SLS** Mapping	40 56 … 248 225 241
LS1/13	42 58 106 122 170 186 234 250	Same as Normal **SLS** Mapping	42 58 … 250 161 177
LS1/14	44 60 108 124 172 188 236 252	44 60 … 252 192 208	44 60 … 252 97 113
LS1/15	46 62 110 126 174 190 238 254	46 62 … 254 64 80	46 62 … 254 33 49
LS2/0	1 17 65 81 129 145 193 208	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS2/7	15 31 79 95 143 159 207 223	Same as Normal **SLS** Mapping	Same as Normal **SLS** Mapping
LS2/8	33 49 97 113 161 177 225 241	Same as Normal **SLS** Mapping	Failed
LS2/12	41 57 105 121 169 185 233 249	Same as Normal **SLS** Mapping	41 57 … 249 192 208
LS2/13	43 59 107 123 171 187 235 251	Same as Normal **SLS** Mapping	43 59 … 251 128 144
LS2/14	45 61 109 125 173 189 237 253	45 61 … 253 128 144	45 61 … 253 64 80
LS2/15	47 63 111 127 175 191 239 255	47 63 … 255 0 16	47 63 … 255 0 16

Because of the large number of internal **SLS** values being remapped across the relatively small number of links, traffic is essentially evenly distributed across the remaining links. This is true in all cases, regardless of the original number of links or the number of failed links.

1. Display the existing values for the `randsls` parameter by entering the `rtrv-stpopts` command. The value for the `randsls` parameter is shown in the `RANDSLS` field. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
RANDSLS           class0
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

If the `randsls=all` parameter will not be specified with the `chg-stpopts` command, continue the procedure with 5.

If the `randsls=all` parameter will be specified with the `chg-stpopts` command, continue the procedure with 2.

2. Verify the value of the `class1seq` parameter of the `chg-sccpopts` command by entering the `rtrv-sccpopts` command. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0

SCCP OPTIONS
---------------------------
CLASS1SEQ                on
```

   If the value of the `class1seq` parameter is `on`, the `randsls=all` parameter of the `chg-stpopts` command should not be used. The `class1seq=on` parameter allows **UDT**/**XUDT** Class 1 **ITU** messages to be delivered to the remote node in the order that they were received. Using the `randsls=all` parameter with the `class1seq=on` parameter does not guarantee that **UDT**/**XUDT** Class1 **ITU** messages are delivered to the remote node in the order that they were received.

   If you wish to continue delivering **UDT**/**XUDT** Class 1 **ITU** messages to the remote node in the order that they were received, or if the value of the `class1seq` parameter of the `chg-sccpopts` command is `off`, continue the procedure with 5.

   If you do not wish to continue delivering **UDT**/**XUDT** Class 1 **ITU** messages to the remote node in the order that they were received, continue the procedure with 3.

3. Change the value of the `class1seq` parameter of the `chg-sccpopts` command by entering this command.

   `chg-sccpopts:class1seq=off`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-SCCPOPTS: MASP A - COMPLTD
```

4. Verify the changes by entering the `rtrv-sccpopts` command. This is an example of the possible output.

```
rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0
```

```
SCCP OPTIONS
---------------------------
CLASS1SEQ              off
```

5. Change the `randsls` parameter value. For this example, enter this command.

   `chg-stpopts:randsls=all`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

6. Verify the changes using the `rtrv-stpopts` command. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
RANDSLS             all
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

   If the `randsls` parameter value is `off`, `all`, or `class0`, continue the procedure with 10.

   If the `randsls` parameter value is `perls`, continue the procedure by performing one of these steps.

   - If Random SLS will not be applied to ANSI linksets, continue the procedure with 10.
   - If Random SLS will be applied to ANSI linksets, continue the procedure with 7.

7. Verify the value of the `slsreplace` parameter by entering the `rtrv-ss7opts` command. This is an example of the possible output.

```
rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0

SS7 OPTIONS
-----------------------
SLSREPLACE   no
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in *Commands User's Guide*.

If the `slsreplace` parameter value is `yes`, continue the procedure with 10.

If the `slsreplace` parameter value is `no`, continue the procedure with 8.

8. Change the `slsreplace` parameter value. For this example, enter this command.

   `chg-ss7opts:slsreplace=yes`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-12-07 00:22:57 GMT  EAGLE5 40.0.0
CHG-SS7OPTS: MASP A - COMPLTD
```

9. Verify the changes using the `rtrv-ss7opts` command. This is an example of the possible output.

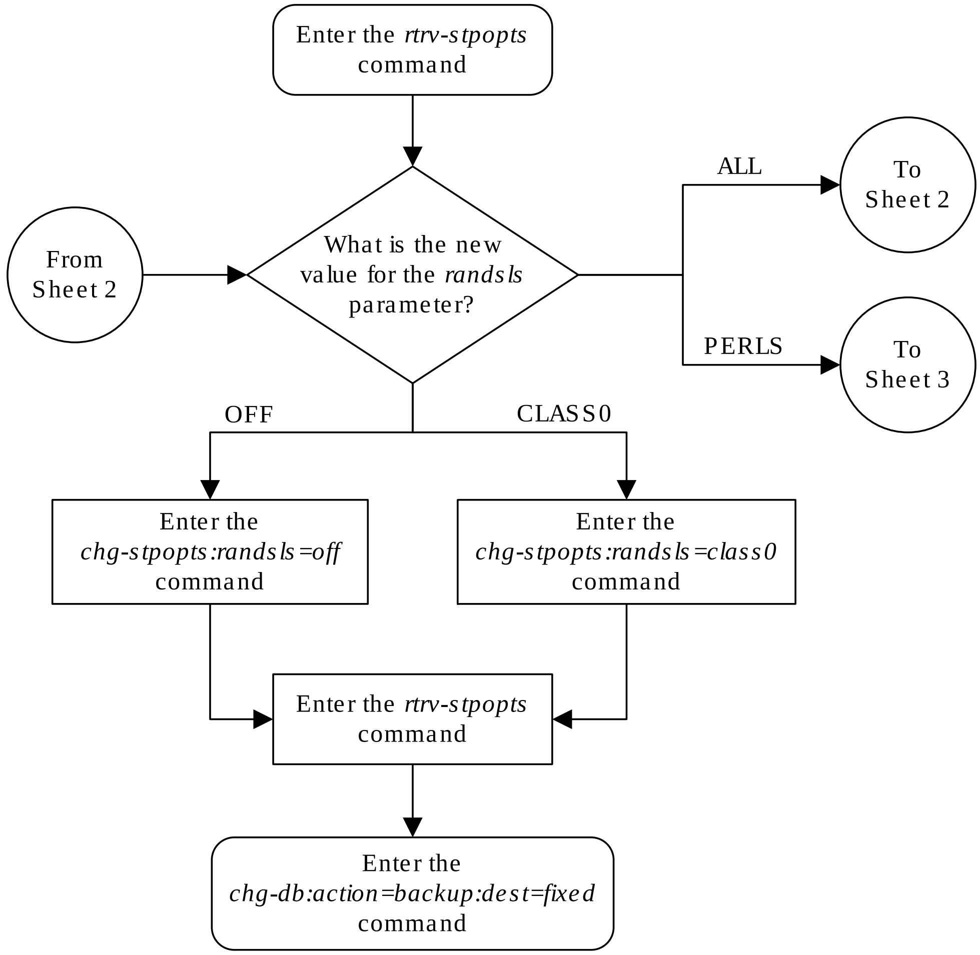
```
rlghncxa03w 08-12-17 16:02:05 GMT  EAGLE5 40.0.0

SS7 OPTIONS
-----------------------
SLSREPLACE    yes
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in *Commands User's Guide*.

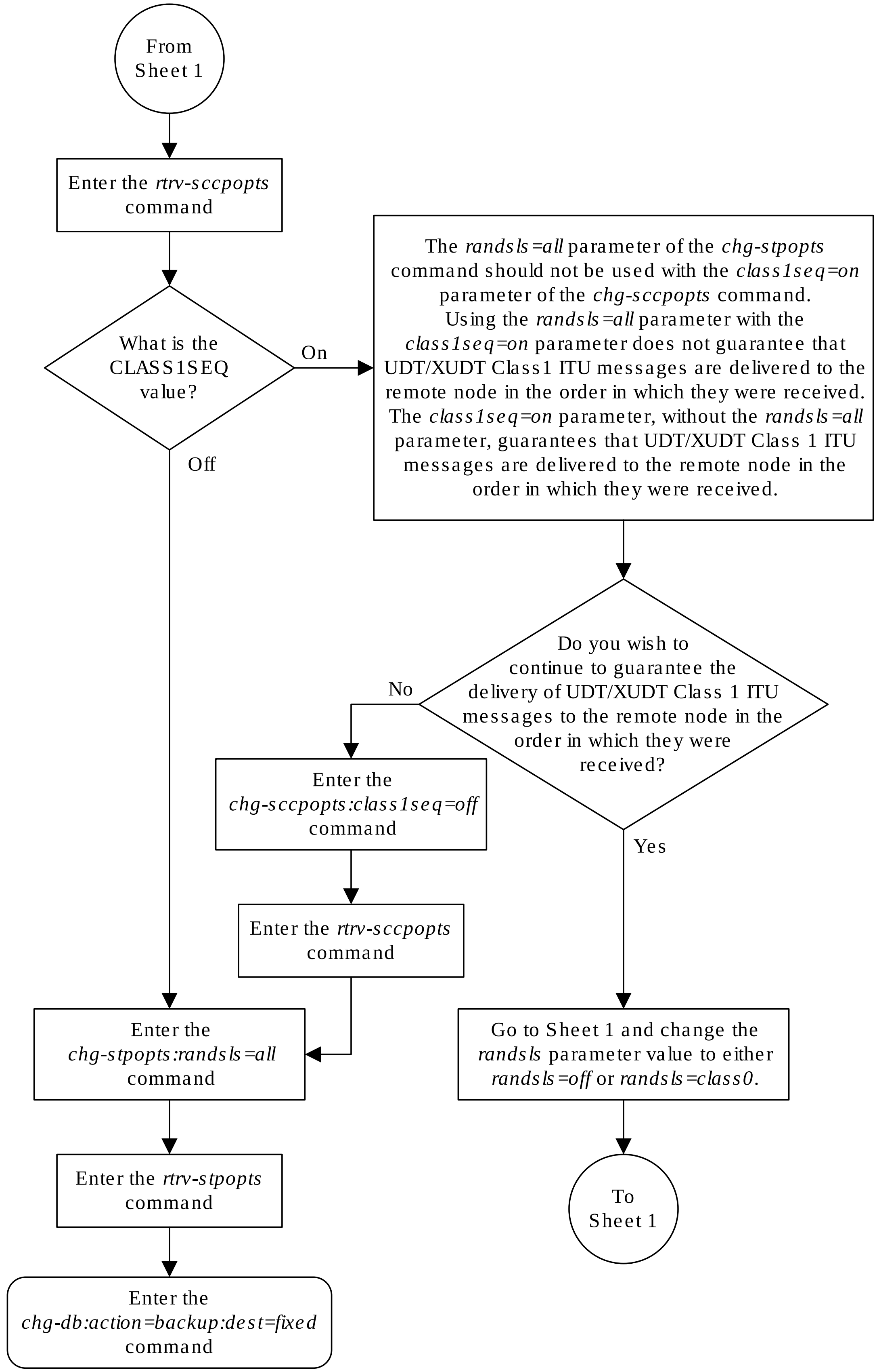
10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

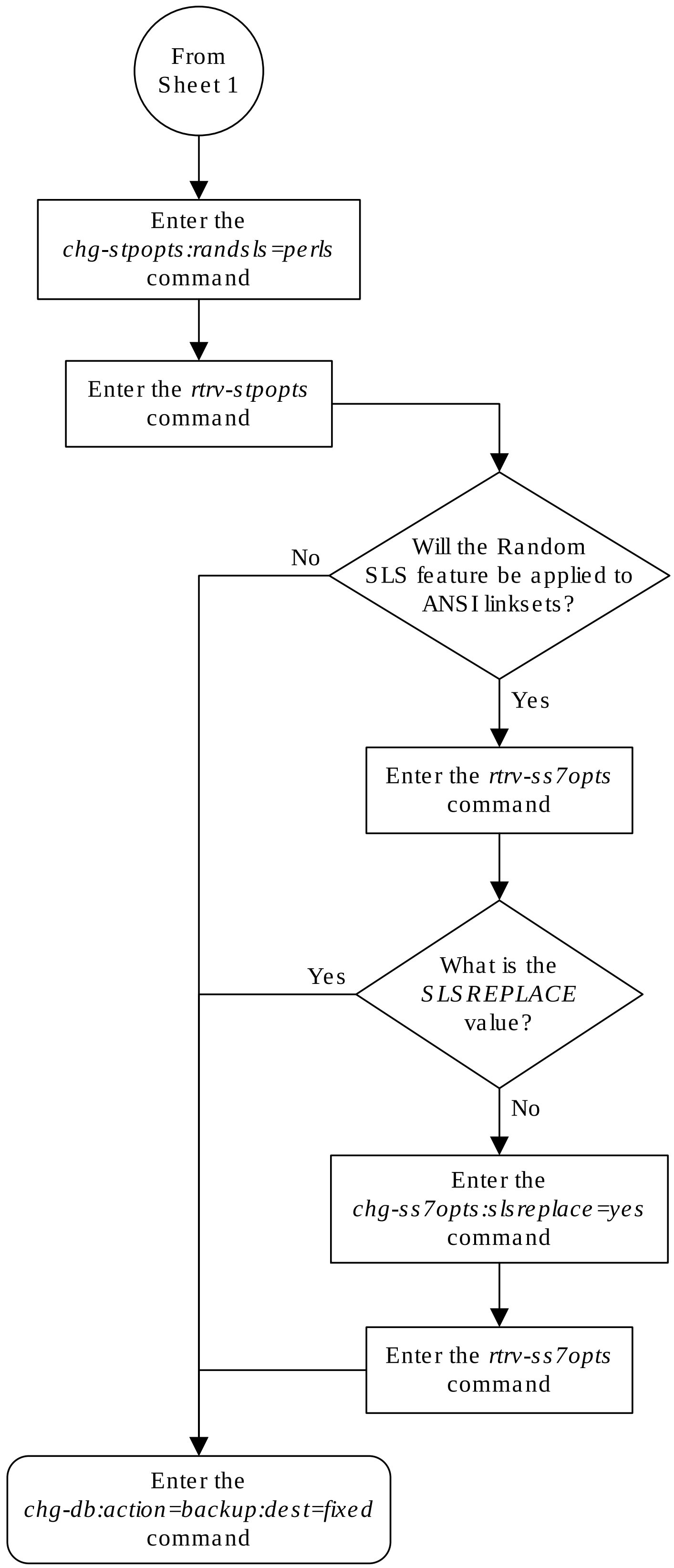
Figure 3-34 Configuring the System for Random SLS Generation



Sheet 1 of 3


From Sheet 1
Enter the rtrv-sccpopts command
What is the CLASS1SEQ value?
On
Off
The randsls=all parameter of the chg-stpopts command should not be used with the class1seq=on parameter of the chg-sccpopts command. Using the randsls=all parameter with the class1seq=on parameter does not guarantee that UDT/XUDT Class1 ITU messages are delivered to the remote node in the order in which they were received. The class1seq=on parameter, without the randsls=all parameter, guarantees that UDT/XUDT Class 1 ITU messages are delivered to the remote node in the order in which they were received.
Do you wish to continue to guarantee the delivery of UDT/XUDT Class 1 ITU messages to the remote node in the order in which they were received?
No
Yes
Enter the chg-sccpopts:class1seq=off command
Enter the rtrv-sccpopts command
Enter the chg-stpopts:randsls=all command
Go to Sheet 1 and change the randsls parameter value to either randsls=off or randsls=class0.
Enter the rtrv-stpopts command
To Sheet 1
Enter the chg-db:action=backup:dest=fixed command

Sheet 2 of 3


From Sheet 1
Enter the chg-stpopts:randsls=perls command
Enter the rtrv-stpopts command
Will the Random SLS feature be applied to ANSI linksets?
No
Yes
Enter the rtrv-ss7opts command
What is the SLSREPLACE value?
Yes
No
Enter the chg-ss7opts:slsreplace=yes command
Enter the rtrv-ss7opts command
Enter the chg-db:action=backup:dest=fixed command

Sheet 3 of 3

3.35 Configuring the Options for the TDM Global Timing Interface

This procedure is used to configure the options for the **TDM** Global Timing Interface using the `chg-clkopts` command with the following parameters.

`:clock` - the clock that is being updated. This parameter has three values.

- `primary` - the primary clock
- `secondary` - the secondary clock
- `all` - both the primary and secondary clocks

`:hsclksrc` – the source of the high-speed master clock.

- `rs422` – **T1** (1544 **KHz**) or **E1** (2048 **KHz**) **RS**-422 clock interface
- `t1framed` – **T1** framed clocking as defined in **ANSIT1**.*101, Synchronization Interface Standard, 1999*.
- `t1unframed` – **T1** unframed clocking as defined in **ANSIT1**.*102, Digital Hierarchy Electrical Signals, 1987*.
- `e1framed` – **E1** framed clocking as defined in section 9 of **ITU**-*T Recommendation G.703, Physical/Electrical Characteristics of Hierarchical Digital Interfaces, October 1998*.
- `e1unframed` – **E1** unframed clocking as defined in section 13 of **ITU**-*T Recommendation G.703, Physical/Electrical Characteristics of Hierarchical Digital Interfaces, October 1998*.

`:hsclkll` – sets the gain of the **LIU** (line interface unit) of the **TDM** when the `hsclksrc` parameter value is either `t1framed`, `t1unframed`, `e1framed`, or `e1unframed`.

- `longhaul` – high gain for the **LIU**
- `shorthaul` – low gain for the **LIU**

> **Caution:**
>
> Changing these options changes the external master clock source for all **E1**, **T1**, **ANSIATM**, or **E1ATM** high-speed signaling links using external timing.

`:force` - allows the `hsclksrc` parameter to be changed if the status of the high-speed clocks is valid. The `force` parameter must be specified when the **EAGLE** contains valid high-speed clocks. The `force` parameter can be specified only if the `hsclksrc` parameter is specified. The `force` parameter has only one value - `yes`. The status of the high-speed clocks is shown by the `rept-stat-clk` command.

When the **EAGLE** is delivered to the user, the values of the `hsclksrc` and `hsclkll` parameters are set to these values:

- `hsclksrc` – `rs422`
- `hsclkll` – `longhaul`

Either of these values can be changed only if the part number of both **TDMs** in card locations 1114 and 1116 is 870-0774-15 or later. If the part numbers of the **TDMs** are not correct, the **TDMs** with the incorrect part numbers must be replaced with **TDM** part number 870-0774-15 or later. If the TDM is being replaced with the E5-TDMs, the GPSM-II cards in card locations 1113 and 1115 and the TDMs in card locations 1114 and 1116 must be replaced with E5-MASP cards.

> **Caution:**
>
> Contact the Customer Care Center, Refer to My Oracle Support (MOS) for the contact information, before replacing the **TDMs**.

If the **EAGLE** does not contain **LIMDS0** cards, but contains **TDM** part numbers 870-0774-15 or later, the clock source for the **TSC** (Time Slot Counter) synchronization feature used by the EAGLE 5 Integrated Monitoring Support feature can be generated from the high-speed master clock source. An external **BITS** clock is not required.

If an external **BITS** clock is connected to a **EAGLE** without **LIMDS0** cards, but with **TDM** part numbers 870-0774-15 or later, the external **BITS** clock is used as the clock source for the **TSC** (Time Slot Counter) synchronization feature. If the external **BITS** clock fails, the clock source for the **TSC** synchronization feature is generated from the high-speed master clock source.

If **LIMDS0** cards are present in the **EAGLE**, the external **BITS** clock is required for timing of the **DS0** signaling links and for **TSC** (Time Slot Counter) synchronization used by the **Integrated Sentinel** . If the **EAGLE** also contains **TDM** part numbers 870-0774-15 or later along with the **LIMDS0** cards, this procedure can be used to select the source of the high-speed master clock for the high-speed links using external timing. The high-speed master clock source cannot be used to generate the clock source for any low-speed links and for the **TSC** (Time Slot Counter) synchronization feature.

1. Display the existing values for the `hsclksrc` and `hsclkll` parameters by entering the `rtrv-clkopts` command.

   The value for the `hsclksrc` and `hsclkll` parameters is shown in the `HSCLKSRC` and `HSCLKLL` fields. This is an example of the possible output.

```
rlghncxa03w 09-02-17 16:02:05 GMT  EAGLE5 40.1.0
CLK OPTIONS
-----------------------

PRIMARY
-----------------------
HSCLKSRC          rs422
HSCLKLL        longhaul

SECONDARY
-----------------------
```

```
HSCLKSRC          rs422
HSCLKLL        longhaul
```

If either the `HSCLKSRC` or `HSCLKLL` values in this step are not the system default values for these parameters (`HSCLKSRC` - `RS422`, `HSCLKLL` - `LONGHAUL`), continue this procedure with 3.

If the `HSCLKSRC` and `HSCLKLL` values in this step are the system default values for these parameters, continue this procedure with 2.

2. Visually verify the part numbers of the **TDMs** in card location 1114 and 1116.

   To change these options, the part number of both **TDMs** must be 870-0774-15 or later. If the part number of one or both **TDMs** is not 870-0774-15 or later, the **TDM** with the incorrect part number must be replaced with **TDMs** with the correct part number.

   > **Caution:**
   >
   > Refer to My Oracle Support (MOS) before replacing the **TDM**s.

3. Verify the status of the high-speed clocks by entering the `rept-stat-clk` command.

   This is an example of the possible output.

```
rlghncxa03w 08-06-01 11:34:04 GMT  EAGLE5 39.0.0
COMPOSITE                              PST           SST       AST
    SYSTEM CLOCK                       IS-NR         Active    -----
ALARM STATUS = No Alarms.
    Primary Comp Clk 1114   (CLK A)    IS-NR         Active    -----
    Primary Comp Clk 1116   (CLK B)    IS-NR         Active    -----
    Secondary Comp Clk 1114 (CLK A)    IS-NR         Idle      -----
    Secondary Comp Clk 1116 (CLK B)    IS-NR         Idle      -----

Clock      Using         Bad
CLK A        9            0
CLK B        0            0
CLK I        0            --

HIGH SPEED                             PST           SST       AST
    SYSTEM CLOCK                       IS-NR         Idle      -----
ALARM STATUS = No Alarms.
    Primary HS Clk 1114    (HS CLK A)  IS-NR         Active    -----
    Primary HS Clk 1116    (HS CLK B)  IS-NR         Active    -----
    Secondary HS Clk 1114  (HS CLK A)  IS-NR         Idle      -----
    Secondary HS Clk 1116  (HS CLK B)  IS-NR         Idle      -----

HS CLK TYPE 1114      = RS422
HS CLK LINELEN 1114   = LONGHAUL
HS CLK TYPE 1116      = RS422
HS CLK LINELEN 1116   = LONGHAUL

Clock      Using         Bad
```

```
HS CLK A      2             0
HS CLK B      0             0
HS CLK I      0             --

Command Completed
```

If the `rept-stat-clk` output does not show any high-speed clocks (`HIGH SPEED SYSTEM CLOCK` , `Primary HS Clk` , `Secondary HS Clk` , `HS CLK TYPE`, and `HS CLK LINELEN` fields), the **EAGLE** does not contain any cards that are capable of using high-speed master timing.

4. Change either the `hsclksrc` or `hsclkll` parameter values, or both parameter values.

   To change the primary and secondary clocks, for this example, enter this command.

   `chg-clkopts:clock=all:hsclksrc=t1unframed:hsclkll=shorthaul:force=yes`

   To change only the primary clock, for this example, enter this command.

   `chg-clkopts:clock=primary:hsclksrc=t1unframed:hsclkll=shorthaul:force=yes`

   To change only the secondary clock, for this example, enter this command.

   `chg-clkopts:clock=secondary:hsclksrc=t1unframed:hsclkll=shorthaul:force=yes`

   The `clock=primary` and `clock=secondary` parameters can be specified only if the EAGLE contains E5-MASP cards.

   Note:

   If the `rept-stat-clk` output in 3 shows valid high-speed clocks, and the `hsclksrc` parameter is specified with the `chg-clkopts` command, the `force=yes` parameter must be specified with the `chg-clkopts` command.

   Caution:

   Changing these options changes the external master clock source for all **E1**, **T1**, **ANSIATM**, or **E1ATM** high-speed signaling links using external timing. A clock outage can occur and traffic on these signaling links can be lost if the new source clock type does not match the source clock that these signaling links are actually using.

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 09-02-07 00:22:57 GMT  EAGLE5 40.1.0
   CHG-CLKOPTS: MASP A - COMPLTD
   ```

5. Verify the changes using the `rtrv-clkopts` command.

This is an example of the possible output.

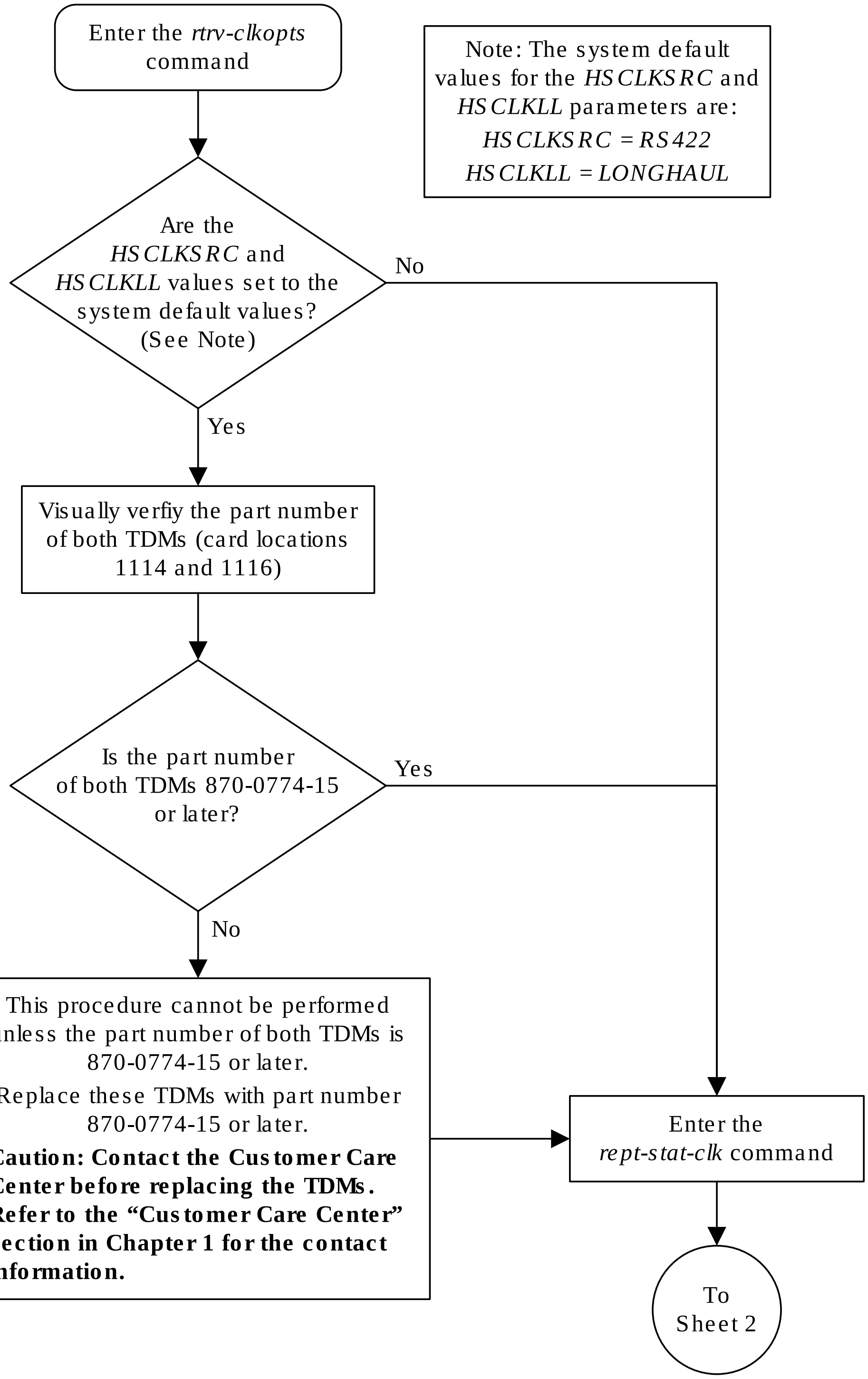
```
rlghncxa03w 09-02-17 16:02:05 GMT  EAGLE5 40.1.0
CLK OPTIONS
-----------------------

PRIMARY
-----------------------
HSCLKSRC     t1unframed
HSCLKLL       shorthaul

SECONDARY
-----------------------
HSCLKSRC     t1unframed
HSCLKLL       shorthaul
```

6. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

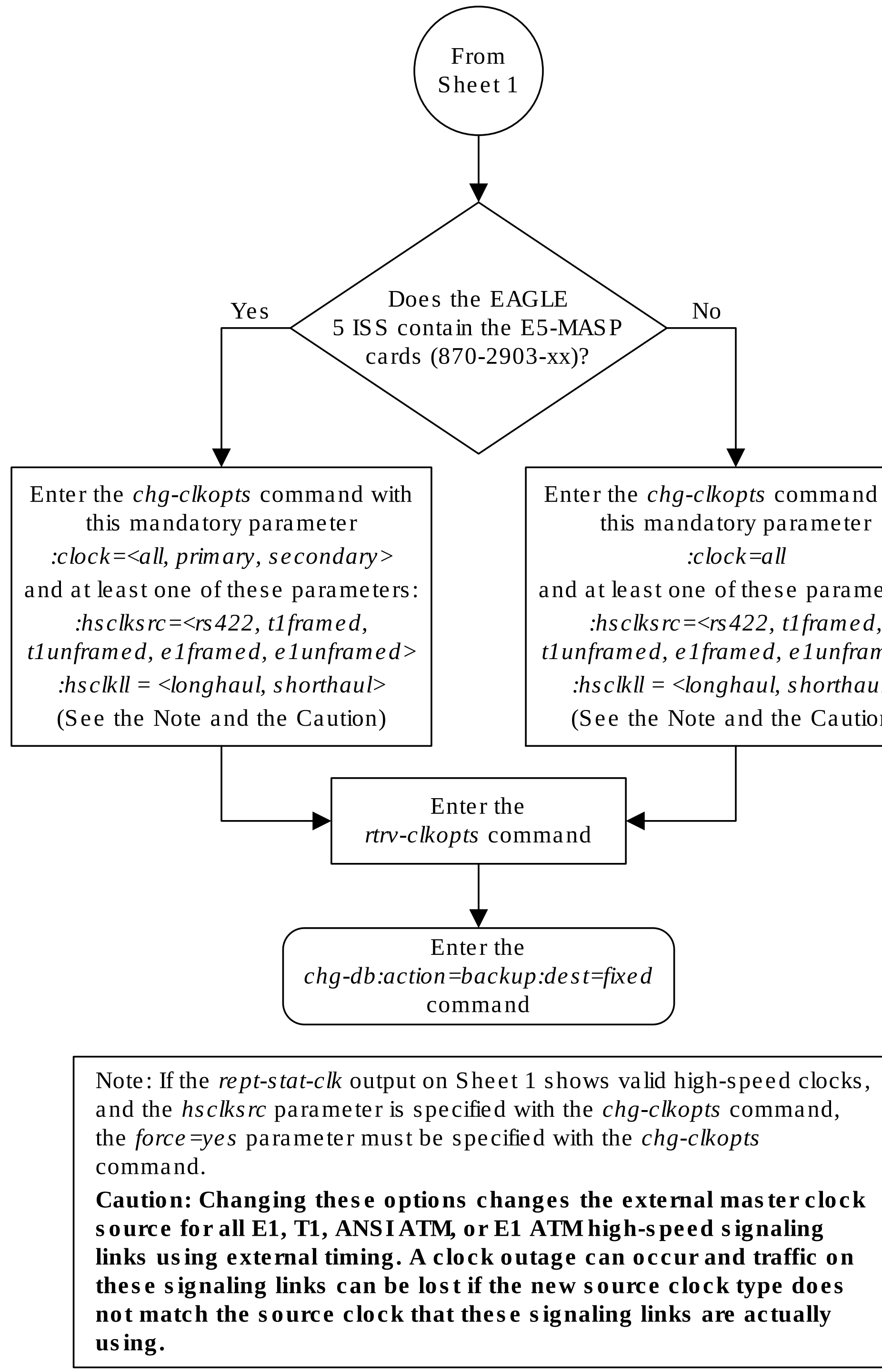
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-35 Configuring the Options for the TDM Global Timing Interface



Sheet 1 of 2


From Sheet 1
Does the EAGLE 5 ISS contain the E5-MASP cards (870-2903-xx)?
Yes
No
Enter the chg-clkopts command with this mandatory parameter
:clock=<all, primary, secondary>
and at least one of these parameters:
:hsclksrc=<rs422, t1framed, t1unframed, e1framed, e1unframed>
:hsclkll = <longhaul, shorthaul>
(See the Note and the Caution)
Enter the chg-clkopts command with this mandatory parameter
:clock=all
and at least one of these parameters:
:hsclksrc=<rs422, t1framed, t1unframed, e1framed, e1unframed>
:hsclkll = <longhaul, shorthaul>
(See the Note and the Caution)
Enter the rtrv-clkopts command
Enter the chg-db:action=backup:dest=fixed command
Note: If the rept-stat-clk output on Sheet 1 shows valid high-speed clocks, and the hsclksrc parameter is specified with the chg-clkopts command, the force=yes parameter must be specified with the chg-clkopts command.
Caution: Changing these options changes the external master clock source for all E1, T1, ANSI ATM, or E1 ATM high-speed signaling links using external timing. A clock outage can occur and traffic on these signaling links can be lost if the new source clock type does not match the source clock that these signaling links are actually using.

Sheet 2 of 2

3.36 Configuring the Restricted Linkset Option

This procedure is used to configure the restricted linkset option using the chg-ss7opts command with the lsrestrict parameter. The lsrestrict parameter has two values:

- on – enables the lsrestrict option
- off – disables the lsrestrict option.

When a large linkset (a linkset containing more than three links) first becomes available, there may not be enough available links to carry the normal amount of traffic on the linkset. The **EAGLE** sends response method **TFA**/**TFRs** when the number of links within a linkset, specified by the tfatcabmlq parameter for that linkset, are active and available to carry traffic. This was designed to prevent congestion on the newly available linksets. Internally in the **EAGLE**, if a single link within a lower cost route is active, the **EAGLE** attempts to route traffic over the lower cost route. If no traffic or small amounts of traffic are arriving due to the issuance of a **TFR**, then no congestion should occur.

However, this behavior applies only to traffic destined for remote nodes and not to traffic destined for the **EAGLE** itself. Typically, messages that are global title routed are destined for the **EAGLE**'s true, secondary or capability point code. The existing congestion prevention mechanism does not prevent traffic destined for **EAGLE** to be controlled by the linkset's tfatcabmlq parameter. This is because **TFx** messages have an affected point code field that is the far end destination point code and not the **EAGLE**'s point code, so traffic destined for **EAGLE** continues to arrive for the restricted destination. It is not feasible to place **EAGLE**'s point code in the affected destination field as this would affect all traffic destined for **EAGLE** and not just traffic over a specific route.

With the lsrestrict=off option, the **EAGLE** continues to route traffic in this manner.

The lsrestrict=on option enhances the **EAGLE**'s existing behavior of the linkset's tfatcabmlq parameter and allow the state of the route combined with the cost value of the route to determine the preferred route to use.

Turning the lsrestrict option on changes the way the **EAGLE** routes messages by using the state of the route along with the cost of the route to determine the preferred route to use. With this option on, the preferred route is not the absolute lowest cost available route in the routeset. A route is considered available if its status is either Allowed or **Restricted**. If the state of the absolute lowest cost route in the routeset is **Restricted**, the preferred route is the lowest cost route in the routeset whose status is Allowed. Make sure that you wish to have the **EAGLE** route messages in this manner before turning the lsrestrict option on.

In previous releases, a C linkset's tfatcabmlq parameter is not configurable and set to 1 (the linkset is allowed when the first link is available). This is because the C linkset is designed for message trafficking between the mate **STP**'s and would allow these messages to be transferred as soon as the first link in the C linkset was available. The lsrestrict=on option allows the tfatcabmlq parameter value for a C linkset to be from 0 to 16, just as any other linkset.

With the `lsrestrict=off` option, the `tfatcabmlq` parameter value for a C linkset is set to 1 and cannot be changed.

When a linkset that was previously prohibited becomes restricted (that is, the number of links that became available is less than the required number of links as specified by the linkset's `tfatcabmlq` parameter) the following events occur when the `lsrestrict` option is `on`:

1. The **EAGLE** 5 **ISS** does not broadcast **TFAs**.
2. Point codes that were previously prohibited and use the linkset as a lower cost route are marked restricted. The **EAGLE** continues to broadcast **TFRs**.
3. Point codes that were previously restricted and use the linkset as a least cost route remain restricted. The **EAGLE** does not broadcast any **TFx** message. For these point codes, **RSRT** will respond to **RSP** messages with a **TFR**, and will not respond to **RSR** messages.
4. The **EAGLE** marks the linkset as restricted.
5. If a higher cost route is available, the **EAGLE** routes the traffic over the higher cost route.

Once the required number of links are available for the linkset, the following events occur when the `lsrestrict` option is `on`:

1. The **EAGLE** marks the previously prohibited/restricted point codes as allowed that use the linkset as a lower cost route (unless the point code's nonadjacent status is prohibited).
2. The **EAGLE** does not broadcast **TFAs** for the newly allowed point codes, but responds to **RSR**/**RSP** messages with a **TFA**.
3. The **EAGLE** marks the linkset as allowed. The appropriate changeback procedures are performed and traffic is processed normally.

Canceling the `RTRV-LS` Command

Because the `rtrv-ls` command used in this procedure can output information for a long period of time, the `rtrv-ls` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` command was entered, from another terminal other that the terminal where the `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the existing value for the `lsrestrict` parameter by entering the `rtrv-ss7opts` command. This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
```

```
SS7 OPTIONS
-----------------------
LSRESTRICT          off
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in *Commands User's Guide*.

> **Note:**
>
> If the `lsrestrict` parameter value in step 1 is `off`, skip steps 2 and 3, and go to step 4.

2. Display the linksets in the database by entering the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
                                 L3T SLT              GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2         001-207-000    none 1   1   no  B   6    off off off
no    off
ls05         002-009-003    scr2 1   1   no  C   4    on  off on
no    off
ls1305       000-005-000    none 1   1   no  A   1    off off off
no    off
ls1307       000-007-000    none 1   1   no  A   1    off off off
no    off
e1m1s1       001-001-001    none 1   1   no  A   7    off off off
no    off
e1m1s2       001-001-002    none 1   1   no  A   7    off off off
no    off

                                 L3T SLT              GWS GWS GWS
LSN          APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i        1-207-0        none 1   1   no  B   4    off off off
---   on
ls1315       0-015-0        none 1   1   no  A   1    off off off
---   off
ls1317       0-017-0        none 1   1   no  A   1    off off off
---   on
e1m2s1       1-011-1        none 1   1   no  A   7    off off off
---   off
e1m2s2       1-011-2        none 1   1   no  A   7    off off off
---   off
```

```
Link set table is (11 of 1024) 1% full.
```

> **Note:**
>
> If there are no C linksets (linksets with the value `C` in the `LST` column) shown in the `rtrv-ls` output in step 2, skip step 3 and go to step 4.

3. Change the `tfatcabmlq` parameter value for one of the C linksets shown in step 2 to 0 using the `chg-ls` command. For this example, enter this command.

   `chg-ls:lsn=ls05:tfatcabmlq=0`

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-07  08:38:45 GMT  EAGLE5 36.0.0
   Link set table is ( 11 of 1024)  1% full
   CHG-LS:  MASP A - COMPLTD
   ```

   After the `chg-ls` command has been performed, repeat step 3 with the name of another C linkset shown in step 2.

   When all the C linksets have been changed, go to step 4.

   > **Note:**
   >
   > When the `tfatcabmlq` parameter is set to `0`, its value in the `rtrv-ls:lsn=<linkset name>` output is shown as 1/2 of the number of signaling links contained in the linkset.

4. Change the value of the `lsrestrict` parameter.

   If the current value of the `lsrestrict` parameter is off, enter this command.

   `chg-ss7opts:lsrestrict=on`

   If the current value of the `lsrestrict` parameter is on, enter this command.

   `chg-ss7opts:lsrestrict=off`

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
   CHG-SS7OPTS: MASP A - COMPLTD
   ```

> **Caution:**
>
> Turning the `lsrestrict` option on changes the way the **EAGLE** routes messages by using the state of the route along with the cost of the route to determine the preferred route to use. With this option on, the preferred route is not the absolute lowest cost available route in the routeset. A route is considered available if its status is either Allowed or **Restricted**. If the state of the absolute lowest cost route in the routeset is **Restricted**, the preferred route is the lowest cost route in the routeset whose status is Allowed. Make sure that you wish to have the **EAGLE** route messages in this manner before turning the `lsrestrict` option on.

5. Verify the changes using the `rtrv-ss7opts` command. This is an example of the possible output.

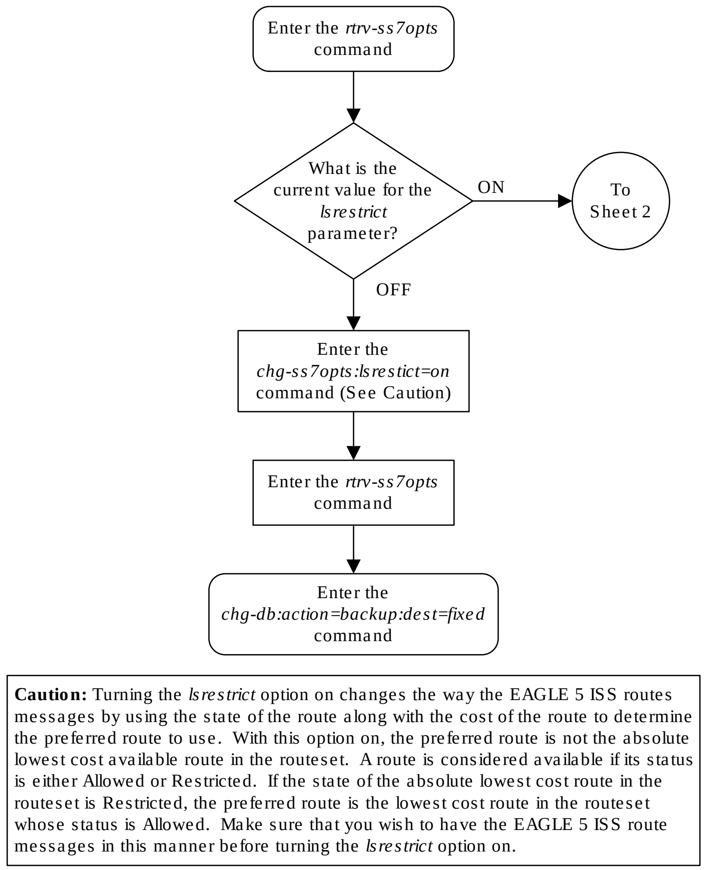
```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0

SS7 OPTIONS
-----------------------
LSRESTRICT          on
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in *Commands User's Guide*.

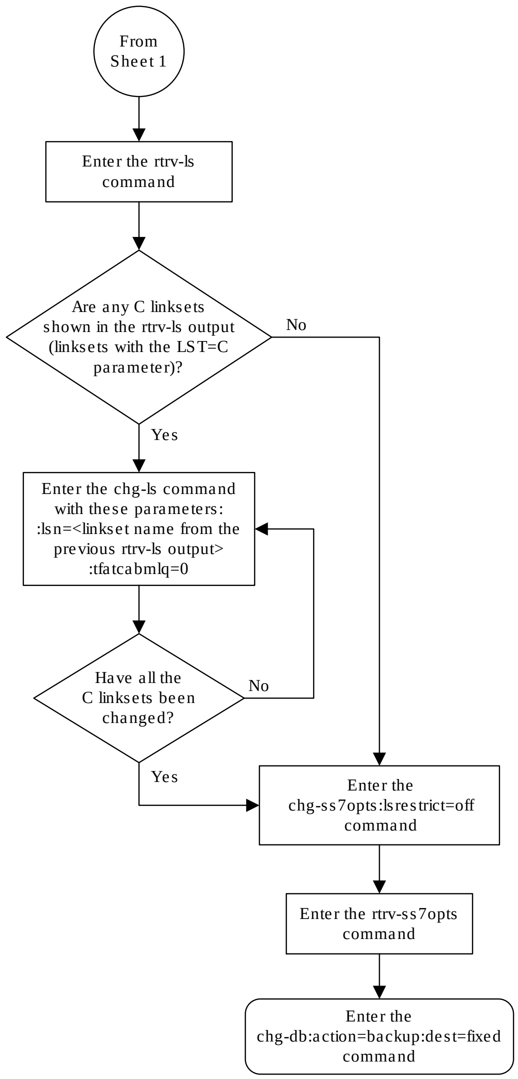
6. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-36 Configuring the Restricted Linkset Option



Sheet 1 of 2



Sheet 2 of 2

3.37 Configuring the Options for Handling TFCs on ITU-I and ITU-N Networks

This procedure is used to configure the options for handling **TFCs** on **ITU**-I and **ITU**-N networks using the `chg-ss7opts` command with these two parameters:

`:discardtfci` – This parameter specifies that the **EAGLE** 5 **ISS** discards **TFC** traffic received from an **ITU**-I network (`discardtfci=on`), or does not discard **TFC** traffic received from an **ITU**-I network (`discardtfci=off`). The system default value for this parameter is `off`.

`:discardtfcn` – This parameter specifies that the **EAGLE** 5 **ISS** discards **TFC** traffic received from an **ITU**-N network (`discardtfcn=on`), or does not discard **TFC** traffic received from an **ITU**-N network (`discardtfcn=off`). The system default value for this parameter is `off`.

1. Display the existing values for the `discardtfci` and `discardtfcn` parameters by entering the `rtrv-ss7opts` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
   SS7 OPTIONS
   -----------------------
   DISCARDTFCI          off
   DISCARDTFCN          off
   ```

   > **Note:**
   >
   > The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in the *Commands Manual*.

2. Change the value of the `discardtfci` and `discardtfcn` parameters.

   The values of these parameters is either `on` or `off`. The value specified in this step cannot be the same as the value shown in step 1.

   If you wish to change the value of the `discardtfci` parameter, specify the `discardtfci` parameter with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:discardtfci=on`

   If you wish to change the value of the `discardtfcn` parameter, specify the `discardtfcn` parameter with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:discardtfcn=on`

   If you wish to change the value of both the `discardtfci` and `discardtfcn` parameters, specify the `discardtfci` and `discardtfcn` parameters with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:discardtfci=on:discardtfcn=on`

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
   CHG-SS7OPTS: MASP A - COMPLTD
   ```

3. Verify the changes using the `rtrv-ss7opts` command.

This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
SS7 OPTIONS
-----------------------
DISCARDTFCI          on
DISCARDTFCN          on
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in the *Commands Manual*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

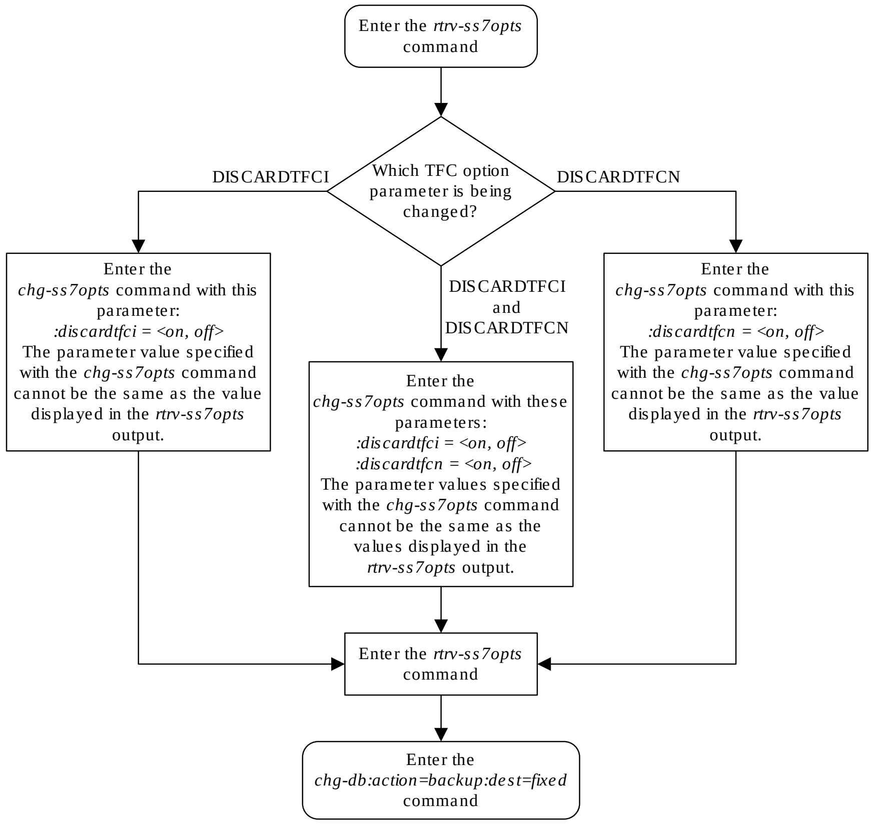
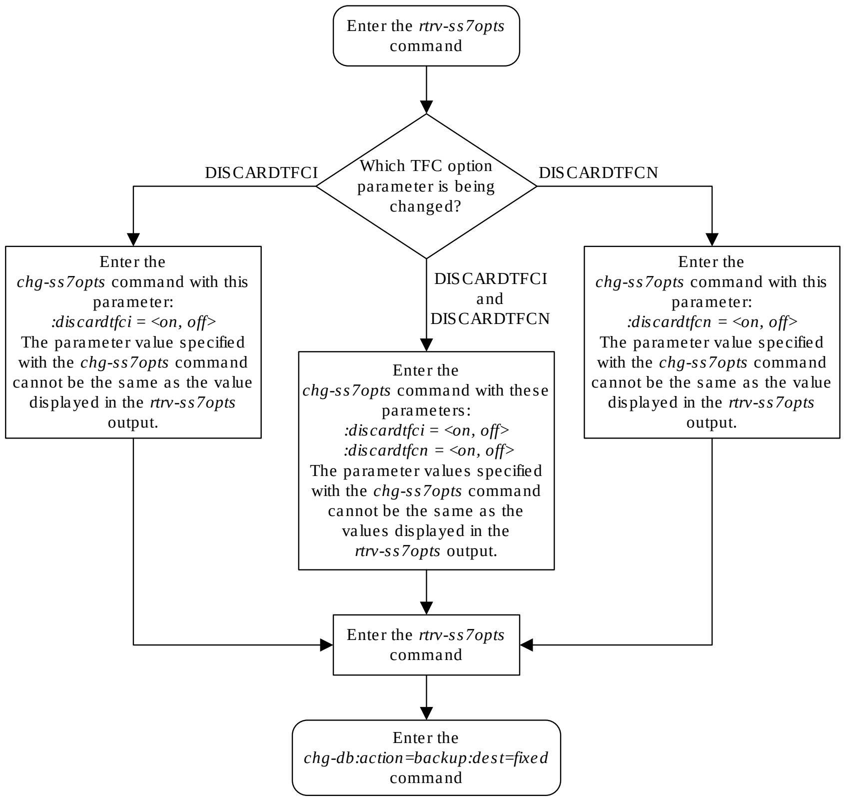

Enter the *rtrv-ss7opts* command
Which TFC option parameter is being changed?
DISCARDTFCI
DISCARDTFCN
DISCARDTFCI and DISCARDTFCN
Enter the *chg-ss7opts* command with this parameter: *:discardtfci = <on, off>* The parameter value specified with the *chg-ss7opts* command cannot be the same as the value displayed in the *rtrv-ss7opts* output.
Enter the *chg-ss7opts* command with these parameters: *:discardtfci = <on, off>* *:discardtfcn = <on, off>* The parameter values specified with the *chg-ss7opts* command cannot be the same as the values displayed in the *rtrv-ss7opts* output.
Enter the *chg-ss7opts* command with this parameter: *:discardtfcn = <on, off>* The parameter value specified with the *chg-ss7opts* command cannot be the same as the value displayed in the *rtrv-ss7opts* output.
Enter the *rtrv-ss7opts* command
Enter the *chg-db:action=backup:dest=fixed* command

Figure 3-37 Configuring the Options for Handling TFCs on ITU-I and ITU-N Networks



3.38 Changing the High-Capacity Card Temperature Alarm Thresholds

This procedure is used to change the temperature alarm thresholds for high-capacity cards (shown in Table 3-26) using the `chg-th-alm` command and these parameters.

`:thermallv1` – The temperature threshold, specified as a percentage of the card's thermal shutdown temperature, at which major alarm **UAM** 0078 is generated. **UAM** 0078 is generated to alert the user that corrective action needs to be performed to prevent the high-capacity cards from overheating. If the high-capacity card is E5-STC, E5-SM4G, E5-TSM, or E5-MCPM-B, the state of the card is not changed. If the high-capacity card is an HC MIM, E5-E1T1, E5-ENET card, or E5-ATM card, or SLIC, the state of the card is changed to IS-ANR (in service-abnormal).

For the following cards, these actions occur when thermallv1 temperature threshold is reached:

E5-ENET-B running ERTHC GPL
Alarm raised; no additional actions.

E5-ATM-B running ATMHC GPL
Alarm raised. PST/SST of card transitions to IS-ANR/Restrict.

E5-ENET-B running IPSHC GPL
Alarm raised; no additional actions. .

E5-ENET-B running IPSG GPL
Alarm raised; no additional actions.

E5-ENET-B running IPLIMx/IPGWx GPL
Alarm raised; no additional actions.

E5-MCPM-B running MCPHC GPL
Alarm raised; no additional actions.

The values for this parameter are 73 to 92. The system default value for this parameter is 92.

`:thermallv2` – The temperature threshold, specified as a percentage of the card's maximum operating temperature, at which critical alarm **UAM** 0077 is generated. When this threshold is reached, the high-capacity cards shed their traffic load, accept no more traffic, and the state of the cards is changed to IS-ANR (in service-abnormal). The values for this parameter are 74 to 100. The system default value for this parameter is 100.

For EPM-B cards, when the thermallv1 temperature threshold is reached, critical alarm 0077 is raised and the following additional actions occur:

E5-ENET-B or SLIC running ERTHC GPL
Outstanding grant requests will be completed but no new grant requests will be accepted. The card's state transitions "in-service abnormal."

E5-ATM-B running ATMHC GPL
PST/SST of card remains IS-ANR/Restrict.

E5-ENET-B or SLIC running IPSHC GPL
Auto inhibits all telnet terminals allowed by user on that card and sets their status to OOS-MT-DSBLD/MEA. Sets card state to out-of-service, maintenance fault.

E5-ENET-B or SLIC running IPSG GPL
Outstanding grant requests will be completed but no new grant requests will be accepted.

E5-ENET-B running IPLIMx/IPGWx GPL
Outstanding grant requests will be completed but no new grant requests will be accepted.

E5-MCPM-B or SLIC running MCPHC GPL
PST/SST of card transitions to IS-ANR/Restrict . If card is primary MCP, role change arbitration is initiated.

For more information on **UAM** 0078 and UAM 077, go to *Unsolicited Alarm and Information Messages Reference*.

Table 3-26 shows the maximum thermal operating limit of temperatures of these cards at selected threshold levels.

Table 3-26 High Capacity Thermal Limits

High Capacity Card	High Capacity Card's Temperature at the Maximum Thermal Operating Limit (thermallv2 = 100%)	High Capacity Card Temperatures at Selected Threshold Levels				
		95%	90%	85%	80%	75%
HC-MIM	82° C 179.6° F	77.9° C 172.2° F	73.8° C 164.8° F	69.7° C 157.5° F	65.6° C 150.1° F	61.5° C 147.2° F
E5-ENET E5-E1T1 E5-STC E5-TSM E5-ATM	95° C 203° F	90.25° C 194.5° F	85.5° C 185.9° F	80.75° C 177.4° F	76° C 168.8° F	71.25° C 160.3° F
E5-SM4G E5-MASP E5-ENET-B E5-ATM-B E5-SM8G-B E5-MCPM-B	90° C 194° F	85.5° C 185.9° F	81° C 177.8° F	76.5° C 169.7° F	72° C 161.6° F	67.5 °C 153.5°F

The `chg-th-alm` command contains other optional parameters. These parameters are not shown here because they are not necessary to provision the high-capacity card temperature alarm thresholds. These parameters are explained in more detail in *Commands User's Guide*.

1. Display the current high-capacity card temperature alarm thresholds in the database by entering the `rtrv-th-alm` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
Thermal Alarm Level 1:              92%
Thermal Alarm Level 2:              100%
RTRV-TH-ALM: MASP A - COMPLTD.
```

> **Note:**
>
> The`rtrv-th-alm` command output contains other fields that are not used in this procedure. If you wish to see all the fields displayed by the`rtrv-th-alm` command, see the`rtrv-th-alm` command description in *Commands User's Guide*.

2. Change the temperature alarm thresholds by entering the `chg-th-alm` command with at least one of the temperature alarm threshold parameters.

   The `thermallv2` parameter value shown in the `rtrv-th-alm` output after the `chg-th-alm` command has been executed must be greater than the `thermallv1` parameter value shown in the `rtrv-th-alm` output.

   If a temperature alarm threshold parameter is not specified with the `chg-th-alm` command, that parameter value will not be changed. The system default values for the temperature alarm threshold parameters are:

   - `:thermallv1 = 92`
   - `:thermallv2 = 100`

   For this example, enter this command.

   `chg-th-alm:thermallv1=74:thermallv2=80`

   When this command has successfully completed, this message should appear.

   ```
   rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
   CHG-TH-ALM: MASP A - COMPLTD
   ```

3. Verify the changes using the `rtrv-th-alm` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
   Thermal Alarm Level 1:                70%
   Thermal Alarm Level 2:                80%
   RTRV-TH-ALM: MASP A - COMPLTD.
   ```

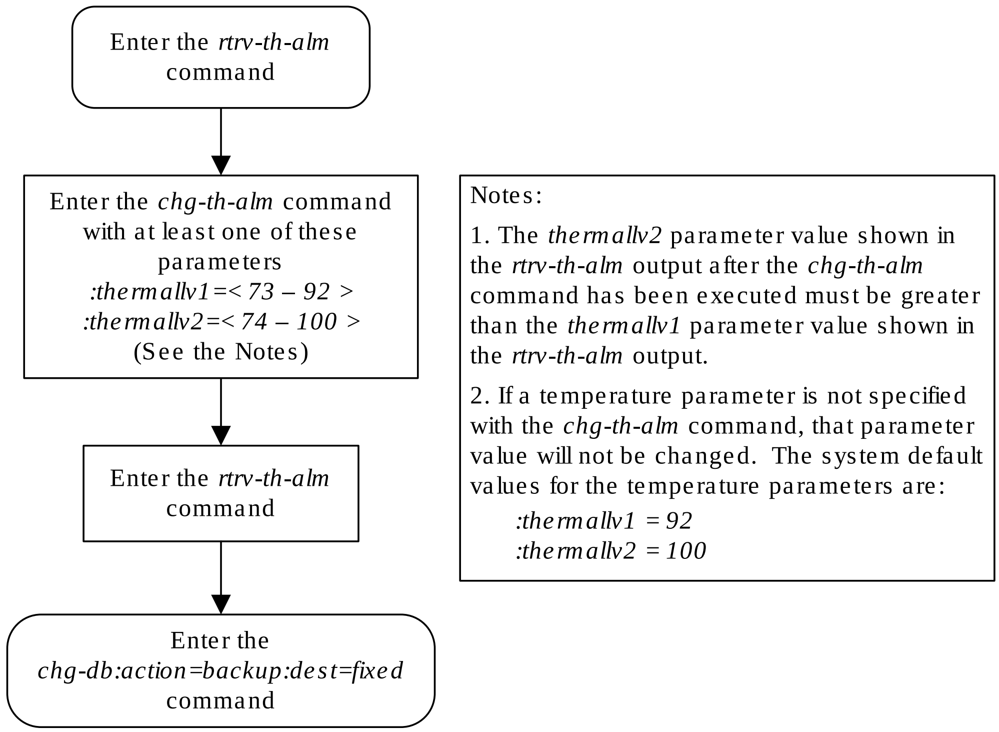
> **Note:**
>
> The`rtrv-th-alm` command output contains other fields that are not used in this procedure. If you wish to see all the fields displayed by the`rtrv-th-alm` command, see the`rtrv-th-alm` command description in *Commands User's Guide*.

4. Backup the new changes using the `chg-db:action=backup:dest=fixed` command.

These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-38 Changing the High-Capacity Card Temperature Alarm Thresholds



3.39 Activating the Origin-Based MTP Routing Feature

This procedure is used to enable and turn on the Origin-Based MTP Routing feature using the feature's part number and a feature access key.

The feature access key for the Origin-Based MTP Routing feature is based on the feature's part number and the serial number of the EAGLE, making the feature access key site-specific.

The `enable-ctrl-feat` command enables the feature by inputting the feature's access key and the feature's part number with these parameters:

> **Note:**
>
> As of Release 46.3, the `fak` parameter is no longer required. This parameter is only used for backward compatibility.

`:fak` – The feature access key provided by Oracle.

`:partnum` – The Oracle-issued part number of the Origin-Based MTP Routing feature, 893014201.

Once this feature is enabled, it is permanently enabled. This feature cannot be enabled with a temporary feature access key.

The `enable-ctrl-feat` command requires that the database contain a valid serial number for the EAGLE, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once theEAGLE is on-site, with the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the EAGLE's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Origin-Based MTP Routing feature, 893014201.

`:status=on` – used to turn the Origin-Based MTP Routing feature on.

The status of the controlled features in the EAGLE is shown with the `rtrv-ctrl-feat` command.

To turn the Origin-Based MTP Routing feature on with the `chg-ctrl-feat` command, the STP option `MTPLPRST` must be set to `yes`. This can be verified by performing the `rtrv-stpopts` command. Perform the Configuring the Frequency of RST Messages on Low Priority Routes procedure to change the `MTPLPRST` option value, if necessary.

Once the Origin-Based MTP Routing feature is enabled and turned on, provisioning for the Origin-Based MTP Routing feature can be performed. Perform these procedures to provision the Origin-Based MTP Routing feature.

- Configuring the Origin-Based MTP Routing SCCP OPC Option
- Adding an Exception Route Entry

Origin-Based MTP Routing Feature

Origin-Based MTP Routing provides greater flexibility and control over the EAGLE routing mechanisms by enabling the user to selectively route traffic to the same destination through different networks depending on various classes of exception routes. The classes of exception routes are shown in the following list.

- DPC and OPC - an exception route using the DPC (destination point code) and OPC (originating point code) in the message to determine how the message will be routed.
- DPC and the originating linkset - an exception route using the DPC and the name of the linkset carrying incoming traffic to the EAGLE to determine how the message will be routed.
- DPC and CIC - an exception route using the DPC and CIC (circuit identification code) in the message to determine how the message will be routed.
- DPC and SI - an exception route using the DPC and SI (service indicator) value in the message to determine how the message will be routed.
- DPC - an exception route using only the DPC in the message to determine how the message will be routed.

The DPC of a route coupled with an exception route class and exception route criteria creates a new destination for the route and also creates an additional entry in the EAGLE's routing table. The number of entries in the EAGLE's routing table is the number of DPCs provisioned with the `ent-dstn` command plus the number of exception route entries provisioned with the `ent-rtx` command.

The number of entries in the EAGLE's routing table cannot exceed the number of DPCs allocated in the routing table, shown in the `DESTINATION ENTRIES ALLOCATED:` row of the `rtrv-rtx` and `rtrv-dstn` output. The EAGLE can contain a maximum of 10,000 entries in the routing table. The total number of entries provisioned in the routing table is shown in the `TOTAL DPC(s):` row of the `rtrv-dstn` or `rtrv-rtx` output.

All other properties of a routeset apply to exception routesets with respect to provisioning (routes and route costs) and alarming with the exception of network management, which is discussed in the "Network Management and Exception Routes" section.

Exception Route Processing Order and Route Costs

The processing order of exception routes is pre-defined. The exception class list in the "Network Management and Exception Routes" section also shows the order that the classes of exception routes are processed.

If a particular route has two exception routes, a DPC and OPC and a DPC and CIC exception route, the DPC and OPC exception route is used first since it is processed before the DPC and CIC exception route.

To determine the priority of exception routes, a relative cost value is assigned to each exception route. The relative cost values are used only within an exception route class. The DPC of the exception route contains multiple entries exception route class value, for example multiple entries with the same DPC and OPC value. The relative cost value determines the order in which the exception routes with the same DPC and OPC values are used to route the messages.

For example, DPC A contains the following exception routes:

- OPC = B: RC=20: LSN=LSB
- OPC = B: RC=20: LSN=LSC
- OPC = B: RC=30: LSN=LSD
- SI = 3: RC=10: LSN=LS3

When an SCCP message is received from Node B, the exception route mechanism splits traffic matching exception routes OPC = B between the linksets LSB and LSC, treating it as a combined linkset, since both entries have the same relative cost value. When both linksets LSB and LSC are not available, traffic is switched to linkset LSD. Even through the SI=3 exception route has a lower relative cost value than the other exception routes for DPC A, the SI=3 exception route is used to route the messages only when the linksets LSB, LSC, and LSD are not available.

CIC Handling

Exception routes can be provisioned based on a single CIC value or a range of CIC values in an ISUP message. The only value used by this feature for all CIC triggers will be the CIC value placed after the routing label and not any CIC value placed within the mandatory fixed, variable or optional parts of the message. Figure 3-39 shows the location of this value within the message.

Figure 3-39 ISDN User Part Message Parts

Routing Label
Circuit Identification Code
Message Type Code
Mandatory Fixed Part
Mandatory Variable Part
Optional Part

Since this feature will not consider any CIC value placed within the mandatory fixed, variable or optional part, messages within ISUP that are applied over a range of circuits (GRS, CGB, CGU, etc.) may be mishandled. Because of this, the user must consider how maintenance is handled before CIC ranging is used in order to ensure that circuit maintenance is performed properly.

For example, if a GRS is sent where the CIC field is 5 and the range field is 10, this implies that circuits 5 to 15 should be reset. If an exception route is provisioned for CIC 5, it would take the path (if available) provisioned since the CIC value in the message matches the one that is provisioned. However, if the exception route provisioned is 6, the CGU will not take the path provisioned even though 6 is within the range specified by the GRS message.

Network Management and Exception Routes

The Origin-Based MTP Routing operates on an end-to-end scheme, and not a point-to-point scheme. As a result, adjacent point codes cannot have exception routes. Correct network handing is critical for the EAGLE and other routing mechanisms to operate properly. Imposing exception routes over adjacent point codes introduces a large element of risk since elements of the network may receive point code and link events late, impacting routing to those and other destinations.

When considering the impact that exception routing could have on the network, the following restrictions are in place to ensure network sanity:

- Adjacent point codes cannot not have exception routes.
- Exception routes do not factor into the status of a destination. A destination's status is defined only by the standard routes entered.
- If all the DPC-based routes to a destination are unavailable, then the status of the destination is listed as prohibited even if there are exception routes available.
- Preventative and broadcast TFx or TCx are not sent based on the status of exception routes. If an exception route is unavailable, the next exception route is chosen ending with the standard provisioned routes.

Congestion Handling and Origin-Based Routing

Since the only identifying characteristic of a TFC message is the capability point code (CPC), the EAGLE is unable to determine if the node or the route used to reach that destination is congested. Normally, the EAGLE would list the destination as congested since there was only one routeset to that destination.

With the Origin-Based MTP Routing feature, there is no longer only one routeset to a destination, but many. However, due to the inexact nature of the TFC, the EAGLE is still unable to determine if an exception route, a normal route, or the node itself that is congested. Thus, once a TFC is received regarding a node within exception routes provisioned against it, the EAGLE lists all routesets to that destination as congested.

To ensure that the EAGLE has the correct congestion status of the destination, the EAGLE sends an RCT regarding that destination over each impacted route and not just the normal route. This ensures that the destination does not "bounce" in and out of congestion. The EAGLE starts level 3 timer T15 at the beginning of the broadcast and level 3 timer T16 at the completion.

If the EAGLE receives a TFC regarding that destination in response to the poll, the EAGLE maintains the congestion level against it, even if it was received over a linkset which is part of an exception routeset and not the normal routeset. This is because the EAGLE can not rely on the incoming linkset of the TFC to identify the route that is congested since the adjacent nodes routing provisioning may be different the EAGLE.

Circular Route Detection and Origin-Based Routing

Normally, if the EAGLE detects that traffic originated from a route is to be sent back over the same route, it changes the status of the DPC to prohibited so that the linkset does not enter into congestion and potentially impact other valid routes. However, with Origin-Based MTP Routing, this can occur since there are some situations where this is the desired action. In order to reduce the impact to the true route of the DPC, the EAGLE prohibits only the impacted route to a destination, and not the destination itself.

This ensures that only the exception route provisioned in this manner is impacted if circular routing is detected and allow all other remaining traffic to reach the DPC.

However, since this is an abnormal routing condition, the EAGLE requires the use of the `force=yes` parameter when entering an exception route where the ILSN and the LSN parameters values are the same

If circular routing is detected on an exception route, enter the `rst-dstn` command to clear this condition.

Gateway Nodes and Exception Routes

Exception routes can be provisioned across networks, where the OPC and DPC do not exist within the same network type (ANSI, ITU-I or ITU-N). However, exception routes can be provisioned only through using full point code values, not alias or cluster point code values. This allows the user to understand which exception routes apply without trying to remember what aliases are provisioned for specific point codes.

Because of MTP conversion restrictions it is necessary that each OPC that is used within a gateway exception routeset must have an alias point code entry in the destination table for the network that the DPC of the exception route resides in. If the alias point code is not present, then the EAGLE is not able to route messages across networks.

SCCP Handling
With SCCP messaging, there are three possible OPC values that may be used; the OPC originally in the routing header, the EAGLE true point code, and the CGPA OPC (determined by whether the CGPA portion of the message is route-on-dpcssn or route-on-gt). To provide the option on which criteria to use, Origin-Based MTP Routing provides an SCCP option (MOBRSCCPOPC) which has three values:

- `mtp` – The original OPC in the message is used as the OPC value to use for routing the SCCP message.
- `sccp` – If the CGPA portion of the message is route-on-dpcssn, the point code in the CGPA portion of the message, if the CGPA portion of the message is route-on-dpcssn, is used as the OPC value to use for routing the SCCP message. If the CGPA portion of the message is route-on-gt, the MTP option, the original OPC in the message, is used as the OPC value to use for routing the SCCP message.
- `tpc` – The EAGLE's true point code is used as the OPC value to use for routing the SCCP message.

The MOBRSCCPOPC option is provisioned with the `chg-sccpopts` command.

If traffic truly originates from the EAGLE (for example, a UDTS), then the `ilsn` parameter of an exception route is not used in evaluating which exception route to use, if any. This is because the traffic was generated by the EAGLE and did not enter through any linkset.

UDTS/XUDTS messages generated by the EAGLE and messages undergoing global title translation are routed over OPC exception routes. However, other messages originated by the EAGLE, for example, response messages generated by the EAGLE SCCP services/ subsystems, do not use OPC exception routes. These messages are routed using other exception criteria, for example, SI based exception routes, if these exception routes are defined. If these exception routes are not defined, normal routing is applied to these messages.

1. Display the controlled features in the database by entering the `rtrv-ctrl-feat` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 11:43:04 GMT EAGLE5 36.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   SCCP Conversion           893012001  on      ----
   EIR                       893012301  on      ----
   GSM Map Screening (GMS)   893013201  on      ----
   HC-MIM SLK Capacity       893012707  on      64

   The following features have been temporarily enabled:

   Feature Name              Partnum   Status Quantity   Trial Period Left
   Zero entries found.

   The following features have expired temporary keys:

   Feature Name              Partnum
   Zero entries found.
   ```

   If the Origin-Based MTP Routing feature is enabled, the entry `MTP Origin-Based Routing` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the Origin-Based MTP Routing feature is on, no further action can be performed.

   If the Origin-Based MTP Routing feature is not enabled, continue the procedure with 2.

   If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with Oracle. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed.

   If the Origin-Based MTP Routing feature is enabled but not turned on, continue the procedure with 7.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   System serial number = nt00001231

   System serial number is not locked, yet.
   ```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with Oracle. If the serial number is correct but not locked, continue the procedure with 5. If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   System serial number = nt00001231

   System serial number is not locked, yet.
   ```

   If the serial number was not entered correctly, repeat 2 and 3 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2 , if the serial number shown in 2 is correct, or with the serial number shown in 4 , if the serial number was changed in 3 , and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

6. Enable the Origin-Based MTP Routing feature by entering the `enable-ctrl-feat` command.

For this example, enter this command.

```
enable-ctrl-feat:partnum=893014201:fak=<Origin-Based MTP Routing
feature access key>
```

> **Note:**
>
> The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the Origin-Based MTP Routing feature, contact your Oracle Sales Representative or Account Representative.

When the `enable-crtl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
ENABLE-CTRL-FEAT: MASP A - COMPLTD
```

7. Display the existing value for the `mtplprst` parameter by entering the `rtrv-stpopts` command. The value for the `mtplprst` parameter is shown in the `MTPLPRST` field.

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
STP OPTIONS
-----------------------
MTPLPRST           no
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

8. Turn the Origin-Based MTP Routing feature on by entering the `chg-ctrl-feat` command with the part number used in Oracle and the `status=on` parameter.

> **Caution:**
>
> Once the Origin-Based MTP Routing feature is turned on, it cannot be turned off.

For this example, enter this command.

```
chg-ctrl-feat:partnum=893014201:status=on
```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

9. Verify the changes by entering this command.

   `rtrv-ctrl-feat:partnum=893014201`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
MTP Origin-Based Routing  893014201 on     ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

10. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-40 Activating the Origin-Based MTP Routing - Sheet 1 of 4 Feature

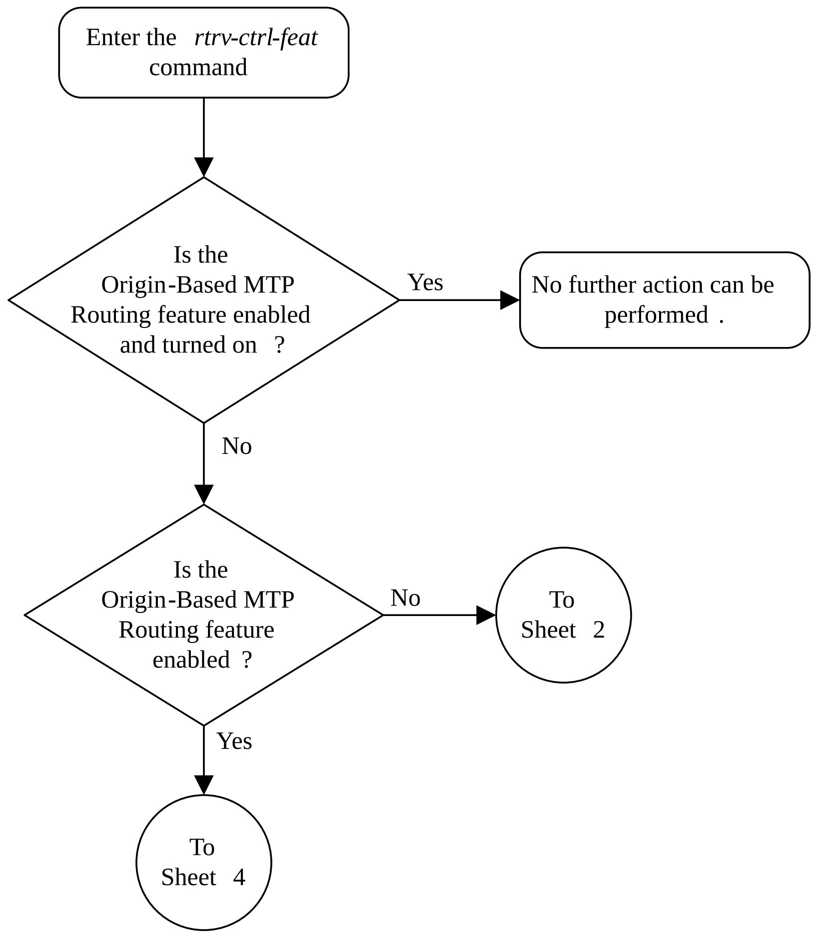


Figure 3-41   Activating the Origin-Based MTP Routing - Sheet 2 of 4

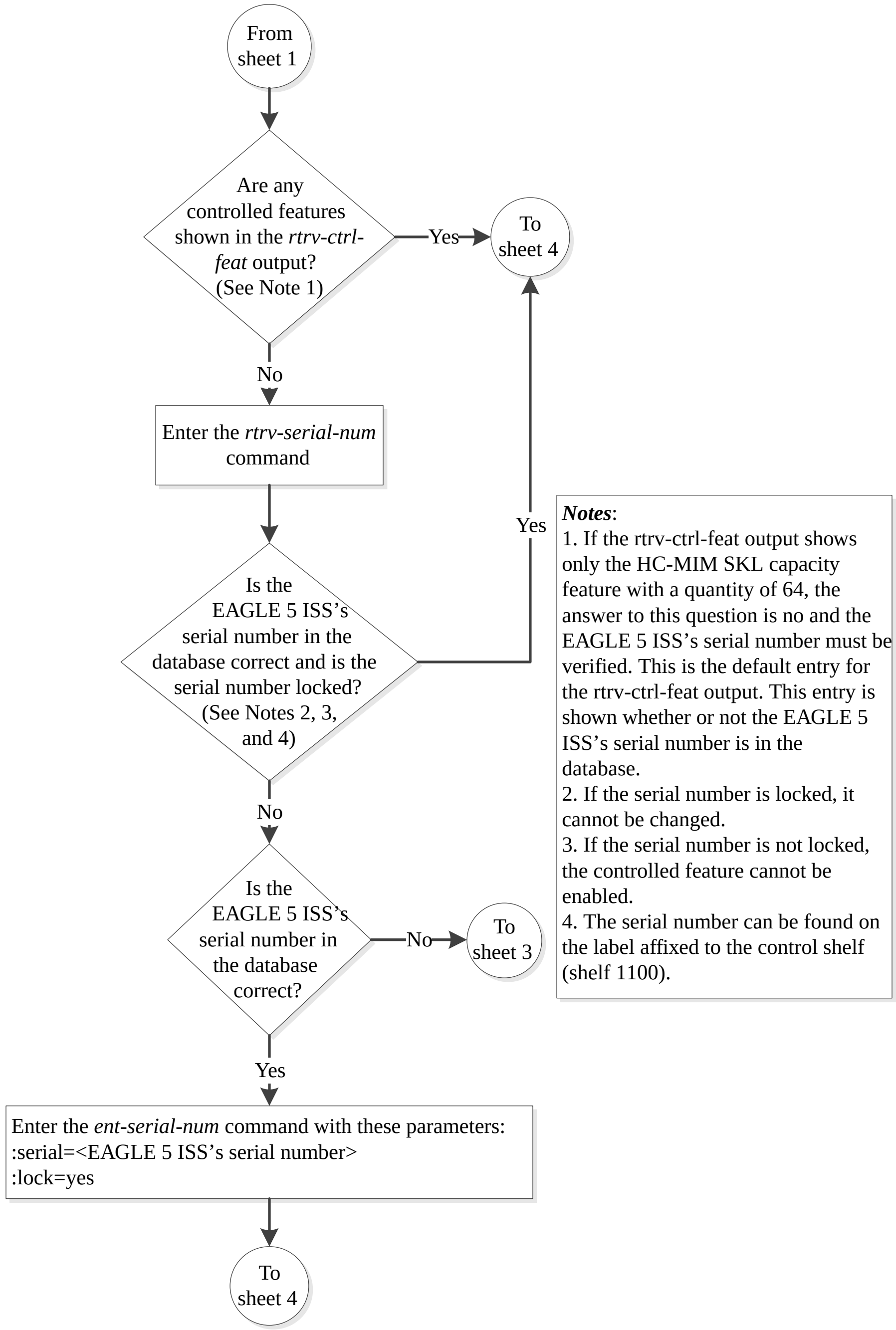


Figure 3-42 Activating the Origin-Based MTP Routing - Sheet 3 of 4

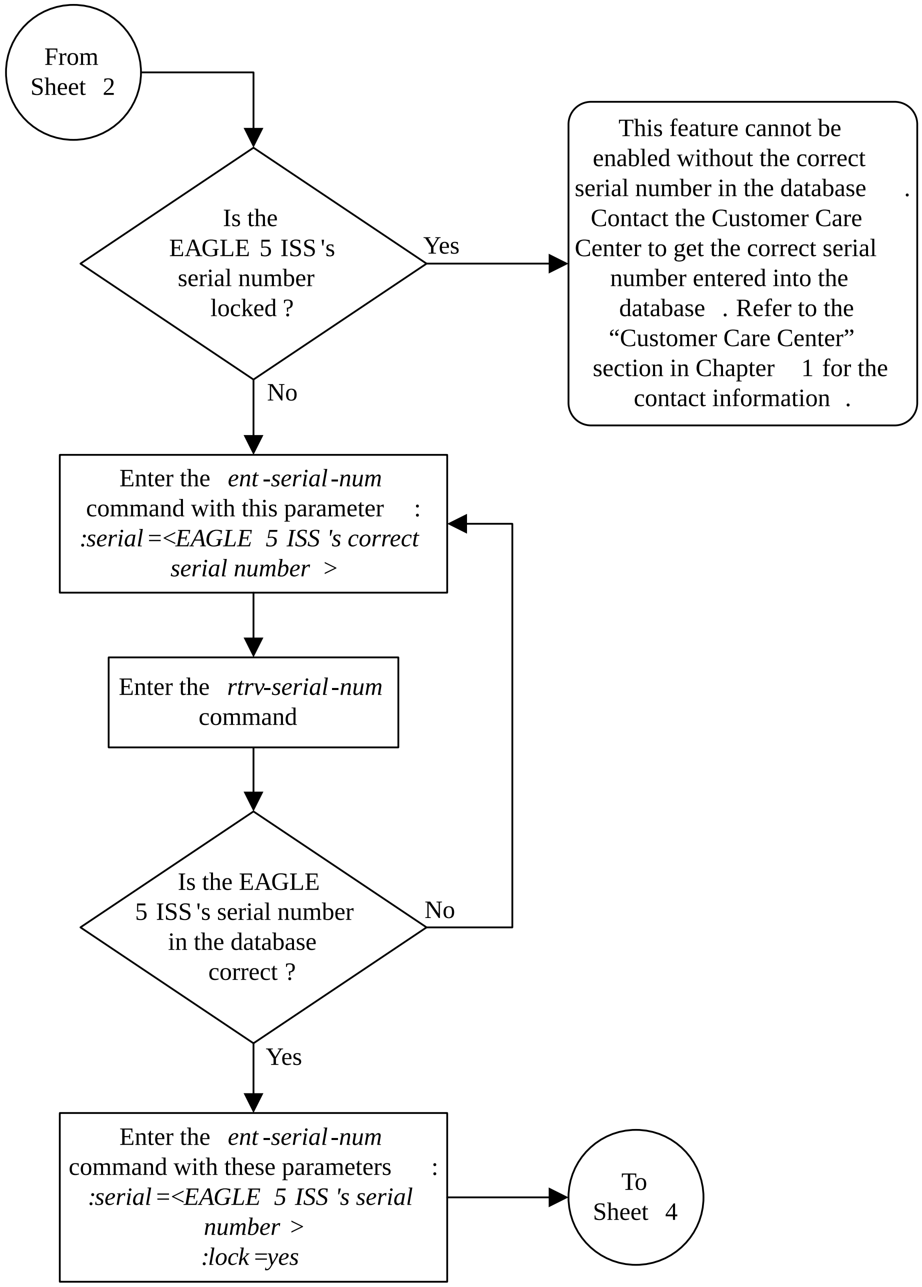
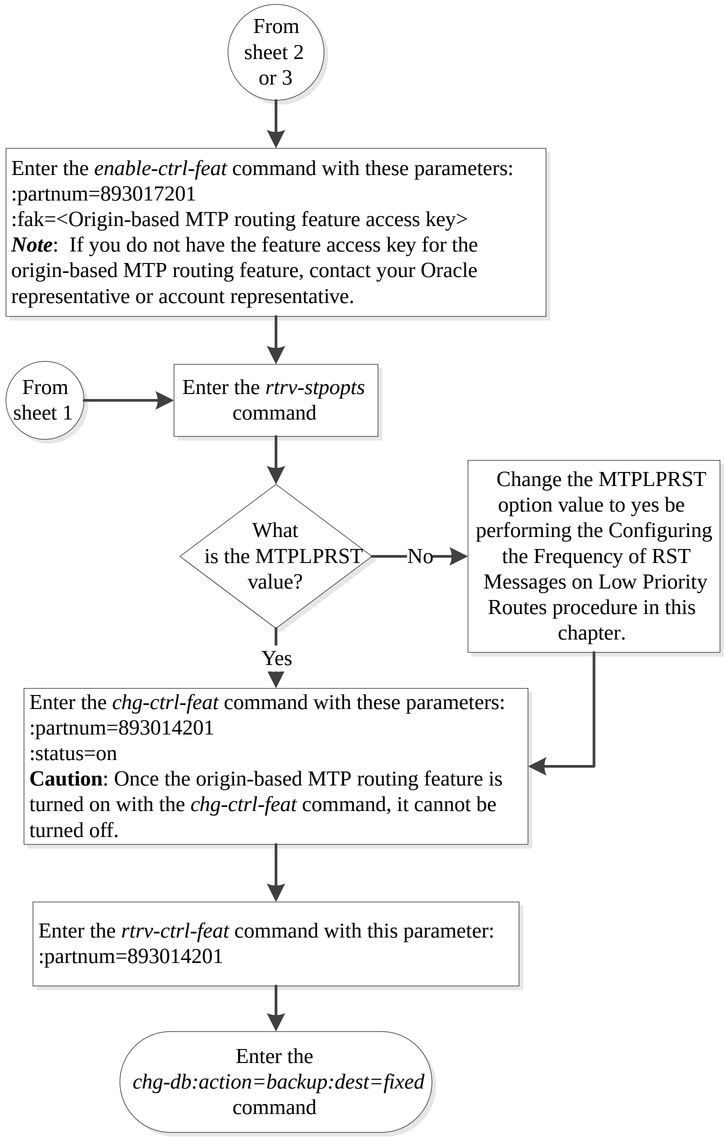


Figure 3-43 Activating the Origin-Based MTP Routing - Sheet 4 of 4



3.40 Configuring the Origin-Based MTP Routing SCCP OPC Option

This procedure is used to configure the option that determines which of the three **OPC** values can be used to route **SCCP** messages for the Origin-Based **MTP** Routing feature. The option is configured with the `mobrsccpopc` parameter of the `chg-sccpopts` command. The `mobrsccpopc` parameter has three values:

`mtp` – The original **OPC** in the message is used as the **OPC** value to use for routing the **SCCP** message.

`sccp` – If the **CGPA** portion of the message is route-on-dpcssn, the point code in the **CGPA** portion of the message, if the **CGPA** portion of the message is route-on-dpcssn, is used as the **OPC** value to use for routing the **SCCP** message. If the **CGPA** portion of the message is route-on-gt, the **MTP** option, the original **OPC** in the message, is used as the **OPC** value to use for routing the **SCCP** message.

`tpc` – The **EAGLE** 5 **ISS**'s true point code is used as the **OPC** value to use for routing the **SCCP** message.

If traffic originated from the Eagle, (for example, a **UDTS** message) then the incoming linkset name (`ilsn` parameter) of the exception route is not used in evaluating which exception route to use, if any. This is because since the traffic was generated by the Eagle it did not enter through any linkset.

The current value of the `mobrsccpopc` parameter is shown in the `MOBRSCCPOPC` field in the `rtrv-sccpopts` command output.

The `mobrsccpopc` parameter can be specified with the `chg-sccpopts` command, and the `MOBRSCCPOPC` field in the `rtrv-sccpopts` command output is displayed only if the Origin-Based **MTP** Routing feature is enabled and turned on. If the `MOBRSCCPOPC` field is not shown in the `rtrv-sccpopts` command output, perform the Activating the Origin-Based MTP Routing Feature procedure to enable and turn on the Origin-Based **MTP** Routing feature.

1. Display the existing value for the `mobrsccpopc` parameter by entering the `rtrv-sccpopts` command.

   If the Origin-Based **MTP** Routing feature is not enabled and turned on, this is an example of the possible output.

   ```
   rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0

   SCCP OPTIONS
   -------------------------------
   CLASS1SEQ                   off
   DFLTGTTMODE                CdPA
   ```

   If the Origin-Based **MTP** Routing feature is enabled and turned on, this is an example of the possible output.

   ```
   rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
   ```

```
SCCP OPTIONS
-------------------------------
CLASS1SEQ                   off
DFLTGTTMODE                CdPA
MOBRSCCPOPC                 MTP
```

> **Note:**
>
> The `rtrv-sccpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-sccpopts` command, see the `rtrv-sccpopts` command description in the *Commands Manual*.

If the `MOBRSCCPOPC` field is not shown in the `rtrv-sccpopts` command output, perform the Activating the Origin-Based MTP Routing Feature procedure to enable and turn on the Origin-Based **MTP** Routing feature.

2. Change the `mobrsccpopc` parameter value.

   The value of the `mobrsccpopc` parameter must be different from the value shown in the `rtrv-sccpopts` output in step 1.

   If you wish to use original **OPC** in the message is used as the **OPC** value to use for routing the **SCCP** message, enter this command.

   `chg-sccpopts:mobrsccpopc=mtp`

   If you wish to use the point code in the **CGPA** portion of the message is used as the **OPC** value to use for routing the **SCCP** message (when the **CGPA** portion of the message is route-on-dpcssn), enter this command.

   `chg-sccpopts:mobrsccpopc=sccp`

   If you wish to use the **EAGLE** 5 **ISS**'s true point code is used as the **OPC** value to use for routing the **SCCP** message, enter this command.

   `chg-sccpopts:mobrsccpopc=tpc`

   ```
   rlghncxa03w 06-10-07 00:22:57 GMT  EAGLE5 36.0.0
   CHG-SCCPOPTS: MASP A - COMPLTD
   ```

3. Verify the changes using the `rtrv-sccpopts` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-17 16:02:05 GMT  EAGLE5 36.0.0
   SCCP OPTIONS
   -------------------------------
   CLASS1SEQ                   off
   DFLTGTTMODE                CdPA
   MOBRSCCPOPC                 MTP
   ```

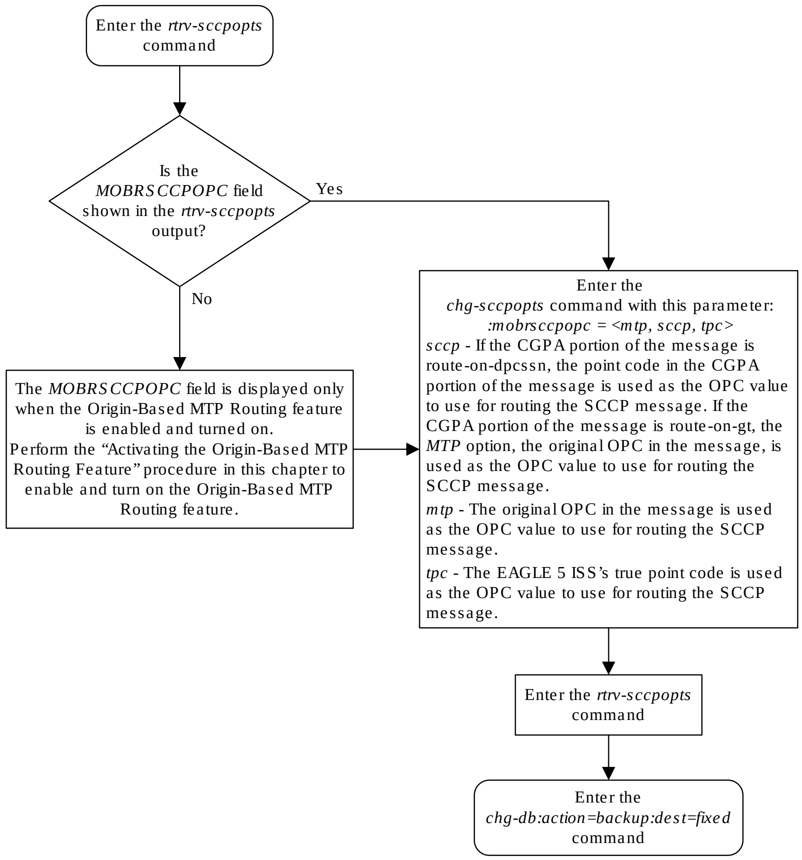
> **Note:**
>
> The `rtrv-sccpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-sccpopts` command, see the `rtrv-sccpopts` command description in the *Commands Manual*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-44 Configuring the Origin-Based MTP Routing SCCP OPC Option



3.41 Adding an Exception Route Entry

This procedure is used to add an exception route to the database using the `ent-rtx` command. The `ent-rtx` command uses these parameters.

`:dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` – The destination point code of the node that the traffic is being sent to.

`:opc`/`opca`/`opci`/`opcn`/`opcn24` – The originating point code of the node sending traffic to the EAGLE.

> **Note:**
>
> See Point Code Formats for a definition of the point code types that are used on the EAGLE and for a definition of the different formats that can be used for **ITU** national point codes.

`:ilsn` – The name of the linkset carrying incoming traffic to the EAGLE.

`:lsn` – The name of the linkset that will carry the traffic to the node specified by the destination point code.

`:si` – The service indicator value that will be assigned to the exception route. The value of the `si` parameter is 3 to 15.

`:cic` – The circuit identification code (**CIC**) value that will be assigned to an exception route containing a single CIC entry or the CIC value that begins a range of CICs that will be assigned to the exception route. The value of the `cic` parameter is 0 to 16383.

`:ecic` – The circuit identification code value that ends the range of CICs that will be assigned to the exception route. The value of the `ecic` parameter is 0 to 16383.

`:rc` – The relative cost value (priority) that will be assigned to the exception route. The value of the `rc` parameter is 0 to 99.

`:force` – This parameter allows an exception route to be added to the database even if the `ilsn` parameter value is the same as the `lsn` parameter value. This parameter has only one value, `yes`.

The combinations of these parameters that can be used with the `ent-rtx` command are shown in Table 3-27.

To add an exception route to the database, the Origin-Based **MTP** Routing feature must be enabled and turned on. If error message E4584 is displayed after the `rtrv-rtx` command is executed, the Origin-Based MTP Routing feature is not enabled or turned on.

```
E4584 Cmd Rej: MTP Origin Based Routing Feature must be ON
```

If the Origin-Based MTP Routing feature is not enabled or turned on, perform the Activating the Origin-Based MTP Routing Feature procedure to enable, if required, and turn on the Origin-Based MTP Routing feature.

The DPC value assigned to the exception route must be assigned to a route. If the required route is not shown in the `rtrv-rte` output, perform on of these procedures to add the required route.

- Adding a Route Containing an SS7 DPC
- Adding a Route Containing a Cluster Point Code
- Adding a Route Containing an IPGWx Linkset

The names of the linksets required specified for the `lsn` and `ilsn` parameters must be provisioned in the database. This can be verified by entering the `rtrv-ls` command. If the required linkset is not in the database, perform one of these procedures to add the linkset.

- Adding an SS7 Linkset
- “Configuring an **IPGWx** Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section.

Adding Linksets for Exception Routes

The linkset must be added according to the following rules:

- If the `dpc` value of the exception route entry is an **ANSI** point code, the adjacent point code of the `lsn` value must be an ANSI point code.
- If the exception route is an OPC-based exception route, the `opc` parameter value cannot be the adjacent point code of the linkset that is specified by the `lsn` parameter value.
- If the `dpc` value of the exception route entry is an ITU-I point code, the adjacent point code of the `lsn` value must be an ITU-I point code. If the linkset contains an **SAPC** (secondary adjacent point code), the adjacent point code of the `lsn` value can be either an ITU-N or ITU-N24 point code if the `sapc` value is an ITU-I point code. If the adjacent point code of the `lsn` value is an ITU-N point code with a group code, when the exception route is added, the group code of the adjacent point code of the linkset does not have to be the same as the group code of the `opcn` value. If an ITU-N linkset is specified for the `ilsn` parameter, the group code of the adjacent point code of the `ilsn` value does not have to match the group code of the adjacent point code of the `lsn` value.
- If the `dpc` value of the exception route entry is an ITU-N point code, the adjacent point code of the `lsn` value must be an ITU-N point code.
  - If the `dpc` value of the exception route entry is an ITU-N point code with no group code assigned to the ITU-N point code, the adjacent point code of the `lsn` value or the adjacent point code of all the linksets in the routeset can be an ITU-I point code if the `sapc` (secondary adjacent point code) value is an ITU-N point code.
  - If the `dpc` value of the exception route entry is an ITU-N point code with a group code, the adjacent point code of the `lsn` value can be an ITU-I point code if the `sapc` value is an ITU-N point code. When the exception route is added, the group code of the `dpcn` value and the `opcn` value must be the same. The group code of the adjacent point code of the `lsn` value and the `ilsn` value must be the same. The group code of the `dpcn` value must be the same as the group code of either the adjacent point code of the `lsn` value or the `sapc` (secondary adjacent point code) assigned to the `lsn` value.
- If the `dpc` value of the exception route entry is an ITU-N24 point code, the adjacent point code of the `lsn` value must be an ITU-N24 point code. If the linkset contains an **SAPC** (secondary adjacent point code), the adjacent point code of the `lsn` value can be an ITU-I point code if the `sapc` value is an ITU-N24 point code.

The SAPC values assigned to the linksets can be verified by entering the `rtrv-ls:lsn=<linkset name>` command.

1. Display the exception routes in the database by entering the `rtrv-rtx` command.

   This is an example of the possible output.

```
rlghncxa03w 08-02-11 11:43:04 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA              LSN        RC     APC

   003-003-003   OPCA
                 009-009-009               lsn1       3      002-002-002
                 010-010-010               lsn1       2      002-002-002
                 ILSN
                 lsn3                      lsn2       2      002-002-003
                 lsn4                      lsn2       1      002-002-003
                 CIC - ECIC
                 15     15                 lsn2       1      002-002-003
                 17     17                 lsn2       7      002-002-003
                 18     30                 lsn1       8      002-002-002
                 SI
                 3                         lsn2       5      002-002-003
                 5                         lsn2       5      002-002-003

   DPCI          RTX-CRITERIA              LSN        RC     APC

   0-123-7       OPCI
                 1-222-3                   lsn3       10     1-234-5
                 1-222-4                   lsn3       11     1-234-5
                 1-222-5                   lsn4       11     2-145-6

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              12
    TOTAL DPC(s):                  32
    CAPACITY (% FULL):              2%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

   If the `rtrv-rtx` output contains any entries, the Origin-Based MTP Routing feature is enabled. Continue the procedure with 3.

   If error message E4584 is displayed after the `rtrv-rtx` command is executed, the Origin-Based MTP Routing feature is not turned on.

```
E4584 Cmd Rej: MTP Origin Based Routing Feature must be ON
```

   If error message E4584 is displayed, perform the Activating the Origin-Based MTP Routing Feature procedure to enable, if required, and turn on the Origin-Based MTP Routing feature. After the Origin-Based MTP Routing feature is turned on, continue the procedure with 2.

2. Display the number of DPCs currently in the database and the number of DPCs that EAGLE can contain by entering the `rtrv-dstn` command with the `msar=only` parameter.

   This is an example of the possible output.

```
rlghncxa03w 08-02-11 11:43:04 GMT  EAGLE5 38.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              12
    TOTAL DPC(s):                  32
    CAPACITY (% FULL):              2%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

3. The number of entries in the EAGLE routing table consists of the number of DPCs provisioned by the `ent-dstn` command and the number of exception routes provisioned by `ent-rtx` command.

   The number of entries in the EAGLE's routing table cannot exceed the number of DPCs allocated in the routing table, shown in the `DESTINATION ENTRIES ALLOCATED:` row of the `rtrv-rtx` and `rtrv-dstn` output. The EAGLE can contain a maximum of 10,000 entries in the routing table. The total number of entries provisioned in the routing table is shown in the `TOTAL DPC(s):` row of the `rtrv-dstn` or `rtrv-rtx` output. If adding the new exception route entry would exceed the number of DPCs allocated in the routing table, perform one of these actions:

   - Increase the number of DPCs allocated in the routing table by performing the Changing the DPC Quantity procedure.
   - Remove enough entries from the routing table to allow the addition of the new exception routes by performing either the Removing a Destination Point Code procedure or the Removing a Route Exception Entry procedure.

   After either these actions are performed, continue the procedure with 4.

   > **Note:**
   >
   > If adding the new exception route entry would exceed the number of DPCs allocated in the routing table and neither of these actions are performed, this procedure cannot be performed. If the number of DPCs provisioned in the routing table is10,000, the only action that can be performed that would allow the addition of new exception routes is to remove existing entries from the routing table.

   If adding the new exception route entry would not exceed the number of DPCs allocated in the routing table, continue the procedure with 4.

4. Display the routes in the database by entering the `rtrv-rte` command.

   If the new exception route entry will be added to an existing DPC shown in the `rtrv-rtx` output, continue the procedure with 5.

This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24    LSN        RC    APCA
   002-002-002 ---------- --------------   ---------- --    -----------
                                               RTX:No  CLLI=-----------
   002-002-003 ---------- --------------   ---------- --    -----------
                                               RTX:No  CLLI=-----------
   003-003-003 ---------- --------------   lsn1       1     002-002-002
                                           lsn2       2     002-002-003
                                               RTX:Yes CLLI=-----------
   004-004-004 ---------- --------------   ---------- --    -----------
                                               RTX:No  CLLI=-----------
   005-005-005 ---------- --------------   ---------- --    -----------
                                               RTX:No  CLLI=-----------
   006-006-006 ---------- --------------   lsn11      1     004-004-004
                                           lsn12      2     005-005-006
                                               RTX:No  CLLI=-----------
   DPCI       ALIASN/N24       ALIASA      LSN        RC    APC
   0-123-7 --------------   -------------- lsn3       1     1-234-5
                                           lsn4       2     2-145-6
                                               RTX:Yes CLLI=-----------
   1-234-5 --------------   -------------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   2-145-6 --------------   -------------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   3-025-6 --------------   -------------- lsn13      1     1-100-5
                                           lsn14      2     4-139-4
                                               RTX:No  CLLI=-----------
   1-100-5 --------------   -------------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   4-139-4 --------------   -------------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   DPCN            ALIASA         ALIASI   LSN        RC    APC
   00002         -------------- ---------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   00003         -------------- ---------- ---------- --    -----------
                                               RTX:Yes CLLI=-----------
   00004         -------------- ---------- lsn5       1     00002
                                           lsn6       2     00003
                                               RTX:No  CLLI=-----------
   11302         -------------- ---------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   12567         -------------- ---------- ---------- --    -----------
                                               RTX:No  CLLI=-----------
   09852         -------------- ---------- lsn15      1     11302
                                           lsn16      2     12567
                                               RTX:No  CLLI=-----------
   DPCN24          ALIASA         ALIASI   LSN        RC    APC
```

The DPC value assigned to the exception route must be assigned to a route. If the required route is not shown in the `rtrv-rte` output, perform one of these procedures to add the required route.

- Adding a Route Containing an SS7 DPC
- Adding a Route Containing a Cluster Point Code
- Adding a Route Containing an IPGWx Linkset

After the required routes have been configured, continue the procedure with 5.

5. Display the linksets in the database by entering the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 38.0.0

                                  L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn1          002-002-002    none 1   1   no  B   2    off off off
no    off
lsn2          002-002-003    none 1   1   no  B   3    off off off
no    off
lsn11         004-004-004    none 1   1   no  B   1    off off off
no    off
lsn12         005-005-005    none 1   1   no  B   4    off off off
no    off

                                  L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn3          1-234-5        none 1   2   no  B   2    off off off
---   off
lsn4          2-145-6        none 1   2   no  B   2    off off off
---   off
lsn13         1-100-5        none 1   2   no  B   1    off off off
---   off
lsn14         4-139-4        none 1   2   no  B   1    off off off
---   off

                                  L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5          00002          none 1   2   no  B   2    off off off
---   off
lsn6          00003          none 1   2   no  B   2    off off off
---   off
lsn15         11302          none 1   2   no  B   2    off off off
---   off
lsn16         12567          none 1   2   no  B   2    off off off
---   off

Link set table is (12 of 1024) 1% full.
```

If the required linkset is not in the database, perform one of these procedures to add the linkset.

- Adding an SS7 Linkset
- “Configuring an IPGWx Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section.

> **Note:**
>
> If the DPC exception route entry is an ANSI DPC, the adjacent point code of the `lsn` value must be an ANSI point code. If the DPC exception route entry is an ANSI DPC, continue the procedure with 7.

6. Display the linkset that will be assigned to the exception route entry by entering the `rtrv-ls` command with the name of the linkset.

   For this example, enter these commands.

   `rtrv-ls:lsn=lsn13`

   This is an example of the possible output.

```
rlghncxa03w 08-02-11 11:43:04 GMT  EAGLE5 38.0.0

                                 L3T SLT             GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn13         1-100-5        none 1    2   no  B    1    off off off ---
off

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
           -----------  1          no     ---  none     7      no

           ITUTFR RANDSLS
           off    all

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCN
          11211
Link set table is (12 of 1024) 1% full.
```

`rtrv-ls:lsn=lsn16`

This is an example of the possible output.

```
rlghncxa03w 08-02-11 11:43:04 GMT  EAGLE5 38.0.0

                                   L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn16         12567          none 1   2   no  B   2    off off off
---   off

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT  SLSRSB
MULTGC
           -----------  1          no     ---  none      7       no

           ITUTFR RANDSLS
           off    all

           IPGWAPC MATELSN    IPTPS  LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---    ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCI
          5-067-1
Link set table is (12 of 1024) 1% full.
```

If the linkset does not meet the criteria shown in the "Adding Linksets for Exception Routes" section, either choose another linkset from the `rtrv-ls` output in 5 and repeat this step, or add a new linkset by performing one of these procedures:

- Adding an SS7 Linkset
- “Configuring an IPGWx Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section. After this step is performed, continue the procedure by performing one of these steps.

- If no more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure with 14.
- If more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure by performing one of these steps.
  – If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are shown in the `rtrv-rtx` command in 1, continue the procedure with 14.
  – If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are not shown in the `rtrv-rtx` command in 1, continue the procedure with 13.

7. Display the DPCs in the database by entering the `rtrv-dstn` command.

> **Note:**
>
> If cluster point codes are displayed in the`rtrv-rtx` or`rtrv-rte` outputs, skip this step and continue the procedure with8.

This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           CLLI         BEI ELEI   ALIASI           ALIASN/N24     DMN
   002-002-002    ----------- no  --- ----------       --------------   SS7
   002-002-003    ----------- no  --- ----------       --------------   SS7
   003-003-003    ----------- no  --- ----------       --------------   SS7
   004-004-004    ----------- no  --- ----------       --------------   SS7
   005-005-005    ----------- no  --- ----------       --------------   SS7
   006-006-006    ----------- no  --- ----------       --------------   SS7

   DPCI           CLLI         BEI ELEI   ALIASA           ALIASN/N24     DMN
   1-234-5        ----------- no  --- --------------   --------------   SS7
   2-145-6        ----------- no  --- --------------   --------------   SS7
   0-123-7        ----------- no  --- --------------   --------------   SS7
   3-025-6        ----------- no  --- --------------   --------------   SS7
   1-100-5        ----------- no  --- --------------   --------------   SS7
   4-139-4        ----------- no  --- --------------   --------------   SS7
   5-067-1        ----------- no  --- --------------   --------------   SS7

   DPCN           CLLI         BEI ELEI   ALIASA           ALIASI         DMN
   00002          ----------- no  --- --------------   ----------       SS7
   00003          ----------- no  --- --------------   ----------       SS7
   00004          ----------- no  --- --------------   ----------       SS7
   09852          ----------- no  --- --------------   ----------       SS7
   11211          ----------- no  --- --------------   ----------       SS7
   11302          ----------- no  --- --------------   ----------       SS7
   12567          ----------- no  --- --------------   ----------       SS7

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              12
    TOTAL DPC(s):                  32
    CAPACITY (% FULL):              2%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

If a cluster point code is not shown in the `rtrv-dstn` output, continue the procedure with 12.

If a cluster point code is shown in the `rtrv-dstn` output, and the DPC of the exception route is not a member of a cluster point code, continue the procedure with 12.

If a cluster point code is shown in the `rtrv-dstn` output, and the DPC of the exception route is a member of a cluster point code, continue the procedure with 8.

8. Display the cluster point code by entering the `rtrv-dstn` command with the cluster point code.

   For this example, enter this command.

   `rtrv-dstn:dpca=010-010-*`

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0

    DPCA          CLLI         BEI ELEI   ALIASI
ALIASN/N24    DMN
    010-010-*     ----------- no  no   ----------
--------------   SS7

   SPCA          NCAI         RCAUSE NPRST SPLITIAM HMSMSC HMSCP
SCCPMSGCNV
   -----------   yes          none   off   none     no     no     none

 Destination table is (33 of 2000) 1% full
 Alias table is (0 of 12000) 0% full
```

   The DPC of an exception route cannot be a member of a cluster point code unless the `NCAI` value of the cluster point code is `yes`. If the `NCAI` value of the cluster point code is `yes`, continue the procedure with 12.

   If the `NCAI` value of the cluster point code is `no`, continue the procedure with 9.

9. Verify that the **NCR** (Nested Cluster Routing) feature is on by entering the `rtrv-feat` command.

   The entry `NCR = on` in the `rtrv-feat` command output shows that the NCR feature is on.

   Note:

   The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the NCR feature is on, continue the procedure with 11.

   If the NCR feature is off, continue the procedure with 10.

10. Turn the NCR feature on by entering this command.

    `chg-feat:ncr=on`

> **Note:**
>
> Once the NCR feature is turned on with the `chg-feat` command, it cannot be turned off.
> The NCR feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the NCR feature, contact your Sales Representative or Account Representative.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 38.0.0
CHG-FEAT: MASP A - COMPLTD
```

11. Change the `NCAI` value for the cluster point code from no to yes by entering the `chg-dstn` command with the cluster point code and the `ncai=yes` parameter. For this example, enter this command.

    `chg-dstn:dpca=010-010-*:ncai=yes`.

    When this command has successfully completed, this message should appear.

```
rlghncxa03w 08-02-11 15:35:05 GMT EAGLE5 38.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              12
    NETWORK DPC(s):                 0
    CLUSTER DPC(s):                 1
    TOTAL DPC(s):                  33
    CAPACITY (% FULL):             1%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):             0%
X-LIST ENTRIES ALLOCATED:         500
CHG-DSTN: MASP A - COMPLTD
```

> **Note:**
>
> If the`opc`/`opca` parameter will not be specified with the`ent-rtx` command, continue the procedure with12.

12. The `opc`/`opca` value of the exception route can be specified with the network cluster and network cluster member values of the point code as asterisks (*).

    If the network cluster and network cluster member values of the `opc`/`opca` value will not be specified as asterisks, continue the procedure by performing one of the steps shown at the end of this step.

    If the network cluster and network cluster member values of the `opc`/`opca` value will be specified as asterisks, and the network indicator value of the `opc`/`opca` value is 6 or greater, continue the procedure by performing one of the steps shown at the end of this step.

If the network cluster and network cluster member values of the `opc`/`opca` value will be specified as asterisks, and the network indicator value of the `opc`/`opca` value will be 1 through 5, the `PCTYPE` value shown in the `rtrv-sid` output must be `OTHER`. Enter the `rtrv-sid` command to verify the `PCTYPE` value.

This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 38.0.0

   PCA              PCI           PCN
CLLI              PCTYPE
   001-001-001      1-001-1       00001
rlghncxa03w       OTHER

   CPCA
   002-002-004      002-002-005        002-002-006      002-002-007
   002-002-008      002-002-009        004-002-001      004-003-003
   050-060-070

   CPCI
   1-001-2           1-001-3           1-001-4          1-002-1
   1-002-2           1-002-3           1-002-4          2-001-1
   7-222-7

   CPCN
   00050             00060             00070            00100
   00080             00090
```

If the `PCTYPE` value shown in the `rtrv-sid` output is `OTHER`, continue the procedure by performing one of the steps shown at the end of this step.

If the `PCTYPE` value shown in the `rtrv-sid` output is `ANSI`, Change the `PCTYPE` value of the self-identification of the EAGLE to `OTHER` by performing the Changing the Self-Identification of the EAGLE procedure. After the `PCTYPE` value is changed, continue the procedure by performing one of the steps shown at the end of this step.

Continue the procedure by performing one of these steps.

- If no more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure with 14.
- If more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure by performing one of these steps.
  - If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are shown in the `rtrv-rtx` command in 1, continue the procedure with 14.
  - If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are not shown in the `rtrv-rtx` command in 1, continue the procedure with 13.

13. For an exception route to have more than two entries with the same exception route criteria, except for the linkset name (the `lsn` parameter value), the 6-Way Loadsharing on Routesets feature must be enabled and turned on.

    To verify the status of the 6-Way Loadsharing on Routesets feature, enter this command.

    `rtrv-ctrl-feat:partnum=893019801`

    The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

    If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, perform the Activating the 6-Way Loadsharing on Routesets Feature procedure to enable and turn on the 6-Way Loadsharing on Routesets feature.

    After the 6-Way Loadsharing on Routesets feature has been enabled and turned on, or if the `rtrv-ctrl-feat` output shows that the 6-Way Loadsharing on Routesets feature is enabled and turned on, continue this procedure with 14.

14. Add the exception route entry by entering the `ent-rtx` command and specifying the parameter combinations shown in Table 3-27 for the exception route criteria being assigned to the exception route.

Table 3-27 Add Exception Route Parameter Combinations

OPC- Based Exception Lists	ILSN- Based Exception Lists	SI- Based Exception Lists	Single CIC- Based Exception Lists	Range of CICs- Based Exception Lists
:dpc/dpca/ dpci/dpcn/ dpcn24 = DPC of the exception route shown in the `rtrv-rtx` or `rtrv-rte` outputs (See Notes 1, 2, 3, and 5)	:dpc/dpca/ dpci/dpcn/ dpcn24 = DPC of the exception route shown in the `rtrv-rtx` or `rtrv-rte` outputs (See Notes 1, 2, and 3)	:dpc/dpca/ dpci/dpcn/ dpcn24 = DPC of the exception route shown in the `rtrv-rtx` or `rtrv-rte` outputs (See Notes 1, 2, and 3)	:dpc/dpca/ dpci/dpcn/ dpcn24 = DPC of the exception route shown in the `rtrv-rtx` or `rtrv-rte` outputs (See Notes 1, 2, and 3)	:dpc/dpca/ dpci/dpcn/ dpcn24 = DPC of the exception route shown in the `rtrv-rtx` or `rtrv-rte` outputs (See Notes 1, 2, and 3)

Table 3-27 (Cont.) Add Exception Route Parameter Combinations

OPC- Based Exception Lists	ILSN- Based Exception Lists	SI- Based Exception Lists	Single CIC- Based Exception Lists	Range of CICs- Based Exception Lists
:opc/opca/ opci/opcn/ opcn24 = OPC value of the exception route (See Notes 5, 6, and 9)	:ilsn = incoming linkset name shown in the `rtrv-ls` output (See Notes 4 and 6)	:si = service indicator, 3 - 15	:cic = circuit identification code, 0 - 16383 (See Note 8)	:cic = the circuit identification code value beginning a range of **CICs**, 0 - 16383 (See Note 8)
:lsn = linkset name shown in the `rtrv-ls` output (See Notes 4 and 6)	:lsn = linkset name shown in the `rtrv-ls` output (See Notes 5, 6, and 9)	:lsn = linkset name shown in the `rtrv-ls` output (See Note 4)	:lsn = linkset name shown in the `rtrv-ls` output (See Note 4)	:ecic = the circuit identification code value ending a range of CICs, 0 - 16383 (See Notes 7 and 8)
:rc = 0 - 99	:rc = 0 - 99	:rc = 0 - 99	:rc = 0 - 99	:lsn = linkset name shown in the `rtrv-ls` output (See Note 4)
:force=yes (See Note 6)	:force=yes (See Note 6)			:rc = 0 - 99

Notes:

1. The DPC of an exception route entry can contain only a maximum of two entries with the same RC value and with either the same OPC value, the same ILSN value, the same SI value, the same CIC value, or range of CIC values if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, the DPC of an exception route entry can contain more than two entries with the same RC value and with either the same OPC value, the same ILSN value, the same SI value, the same CIC value, or range of CIC values, the LSN value for each entry must be different.

2. Each DPC can contain a maximum of six entries with either the same OPC value, the same ILSN value, the same SI value, or the same range of CIC values. The LSN value for each entry must be different. If the 6-Way Loadsharing on Routesets feature is not enabled or turned on, the DPC of a route exception entry can contain only one entry with a single CIC value. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, the DPC of a route exception entry can contain more than one entry with a single CIC value.

4. The linksets specified in this step must meet the criteria shown in the "Adding Linksets for Exception Routes" section.

5. The DPC value cannot be the same as the OPC value.

6. The `force=yes` parameter must be used if the LSN and ILSN values are the same, or if the OPC value is the same as the APC of the linkset specified by the `lsn` parameter.

7. The `ecic` parameter value must be greater than the `cic` parameter value.

8. The range of CIC values cannot overlap an existing range of CIC values. A single CIC value cannot be within a range of CIC values provisioned for another exception route entry. The `cic` or `ecic` values cannot be the same as any single CIC values provisioned for another exception route entry.

9. Asterisks can be used as the values for the network cluster and network cluster member portions of an ANSI point code value for the `opc`/`opca` parameter. For example, the `opc`/`opca` value could be 004-004-* or 007-*-*. An `opc`/`opca` value containing all asterisks (*-*-*) is not allowed.

For this example, enter these commands.

```
ent-rtx:dpca=006-006-006:opca=125-150-175:lsn=lsn11:rc=10
ent-rtx:dpca=006-006-006:opci=2-103-1:lsn=lsn11:rc=20
ent-rtx:dpca=006-006-006:ilsn=lsn12:lsn=lsn11:rc=11
ent-rtx:dpca=006-006-006:ilsn=lsn13:lsn=lsn11:rc=12
ent-rtx:dpca=006-006-006:si=5:lsn=lsn12:rc=10
ent-rtx:dpca=006-006-006:cic=250:lsn=lsn12:rc=15
ent-rtx:dpca=006-006-006:cic=300:ecic=500:lsn=lsn12:rc=25
ent-rtx:dpci=3-025-6:opca=135-102-089:lsn=lsn13:rc=10
ent-rtx:dpci=3-025-6:opci=4-054-0:lsn=lsn13:rc=15
ent-rtx:dpci=3-025-6:opcn=00503:lsn=lsn13:rc=45
ent-rtx:dpci=3-025-6:ilsn=lsn2:lsn=lsn14:rc=20
ent-rtx:dpci=3-025-6:ilsn=lsn4:lsn=lsn13:rc=25
ent-rtx:dpci=3-025-6:ilsn=lsn16:lsn=lsn16:rc=50:force=yes
ent-rtx:dpci=3-025-6:si=3:lsn=lsn13:rc=30
ent-rtx:dpci=3-025-6:cic=100:lsn=lsn14:rc=35
ent-rtx:dpci=3-025-6:cic=50:ecic=75:lsn=lsn13:rc=40
ent-rtx:dpcn=09852:opca=127-063-048:lsn=lsn15:rc=10
ent-rtx:dpcn=09852:opci=3-037-1:lsn=lsn16:rc=15
ent-rtx:dpcn=09852:opcn=00409:lsn=lsn13:rc=20
ent-rtx:dpcn=09852:ilsn=lsn13:lsn=lsn15:rc=25
ent-rtx:dpcn=09852:ilsn=lsn4:lsn=lsn16:rc=30
ent-rtx:dpcn=09852:si=4:lsn=lsn15:rc=35
ent-rtx:dpcn=09852:cic=1000:lsn=lsn16:rc=40
ent-rtx:dpcn=09852:cic=2000:ecic=3000:lsn=lsn15:rc=45
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0
ENT-RTX: MASP A - COMPLTD
```

15. Verify the changes using the `rtrv-rtx` command, specifying these parameters depending on the exception route criteria specified in 14.
    - If the `opc`/`opca`/`opci`/`opcn`/`opcn24` parameter was specified in 14 - enter these parameters and values specified in 14 with the `rtrv-rtx` command – `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`, `opc`/`opca`/`opci`/`opcn`/`opcn24`, and `lsn`.
    - If the `ilsn` parameter was specified in 14 - enter these parameters and values specified in 14 with the `rtrv-rtx` command – `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`, `ilsn`, and `lsn`.

- If the `si` parameter was specified in 14 - enter these parameters and values specified in 14 with the `rtrv-rtx` command – `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`, `si`, and `lsn`.
- If only the `cic` parameter was specified in 14 - enter these parameters and values specified in 14 with the `rtrv-rtx` command – `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`, `cic`, and `lsn`.
- If the `cic` and `ecic` parameters were specified in 14 - enter these parameters and values specified in 14 with the `rtrv-rtx` command – `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24`, `cic`, `ecic`, and `lsn`.

For this example, enter these commands.

```
rtrv-rtx:dpca=006-006-006:opca=125-150-175:lsn=lsn11


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA            RTX-CRITERIA                 LSN        RC     APC

   006-006-006    OPCA
                  125-150-175                  lsn11      10
004-004-004

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%


rtrv-rtx:dpca=006-006-006:opci=2-103-1:lsn=lsn11


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA            RTX-CRITERIA                 LSN        RC     APC

   006-006-006    OPCI
                  2-103-1                      lsn11      20
004-004-004

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=006-006-006:ilsn=lsn12:lsn=lsn11


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA              LSN        RC    APC

   006-006-006   ILSN
                 lsn12                     lsn11      11    004-004-004

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpca=006-006-006:ilsn=lsn13:lsn=lsn11


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA              LSN        RC    APC

   006-006-006   ILSN
                 lsn13                     lsn11      12    004-004-004

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpca=006-006-006:si=5:lsn=lsn12


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA              LSN        RC    APC

   006-006-006   SI
                 5                         lsn12      10    005-005-005

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
```

```
    ALIASES USED:                    0
    CAPACITY (% FULL):               0%
```

```
rtrv-rtx:dpca=006-006-006:cic=250:lsn=lsn12
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA             LSN        RC    APC

   006-006-006   CIC - ECIC
                 250   250                lsn12      15
005-005-005

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=006-006-006:cic=300:ecic=500:lsn=lsn12
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCA          RTX-CRITERIA             LSN        RC    APC

   006-006-006   CIC - ECIC
                 250   250                lsn12      15
005-005-005

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:opca=135-102-089:lsn=lsn13
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA             LSN        RC    APC

   3-025-6       OPCA
                 135-102-089              lsn13      10    1-100-5
```

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:opci=4-054-0:lsn=lsn13
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       OPCI
                 4-054-0                   lsn13      15    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:opcn=00503:lsn=lsn13
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       OPCN
                 00503                     lsn11      15    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:ilsn=lsn2:lsn=lsn14
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC
```

```
   3-025-6       ILSN
                 lsn2                     lsn14      45    4-139-4

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:ilsn=lsn4:lsn=lsn13
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA             LSN        RC    APC

   3-025-6       ILSN
                 lsn4                     lsn13      25    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:ilsn=lsn16:lsn=lsn16
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA             LSN        RC    APC

   3-025-6       ILSN
                 lsn16                    lsn16      50    12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpci=3-025-6:si=3:lsn=lsn13


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       SI
                 3                         lsn13      30    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpci=3-025-6:cic=100:lsn=lsn14


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       CIC - ECIC
                 100   100                 lsn14      35    4-139-4

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpci=3-025-6:cic=50:ecic=75:lsn=lsn13


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       CIC - ECIC
                 50    75                  lsn13      40    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
```

```
    ALIASES USED:                  0
    CAPACITY (% FULL):             0%

rtrv-rtx:dpcn=09852:opca=127-063-048:lsn=lsn15


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA             LSN        RC    APC

   09852         OPCA
                 127-063-048              lsn15      10    11302

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpcn=09852:opci=3-037-1:lsn=lsn16


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA             LSN        RC    APC

   09852         OPCI
                 3-037-1                  lsn16      15    12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpcn=09852:opcn=00409:lsn=lsn13


rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA             LSN        RC    APC

   09852         OPCN
                 00409                    lsn13      20    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
```

```
    EXCEPTION DPC(s):            36
    TOTAL DPC(s):                56
    CAPACITY (% FULL):            3%
ALIASES ALLOCATED:             12000
    ALIASES USED:                 0
    CAPACITY (% FULL):            0%
```

```
rtrv-rtx:dpcn=09852:ilsn=lsn13:lsn=lsn15
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA              LSN        RC     APC

   09852         ILSN
                 lsn13                     lsn15      25     11302

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                 20
    EXCEPTION DPC(s):            36
    TOTAL DPC(s):                56
    CAPACITY (% FULL):            3%
ALIASES ALLOCATED:             12000
    ALIASES USED:                 0
    CAPACITY (% FULL):            0%
```

```
rtrv-rtx:dpcn=09852:ilsn=lsn4:lsn=lsn16
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA              LSN        RC     APC

   09852         ILSN
                 lsn4                      lsn16      30     12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                 20
    EXCEPTION DPC(s):            36
    TOTAL DPC(s):                56
    CAPACITY (% FULL):            3%
ALIASES ALLOCATED:             12000
    ALIASES USED:                 0
    CAPACITY (% FULL):            0%
```

```
rtrv-rtx:dpcn=09852:si=4:lsn=lsn15
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA              LSN        RC     APC

   09852         SI
```

```
                  4                         lsn15      35     11302

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpcn=09852:cic=1000:lsn=lsn16
```

```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA              LSN         RC     APC

   09852         CIC - ECIC
                 1000                      lsn16      40     12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpcn=09852:cic=2000:ecic=3000:lsn=lsn15
```

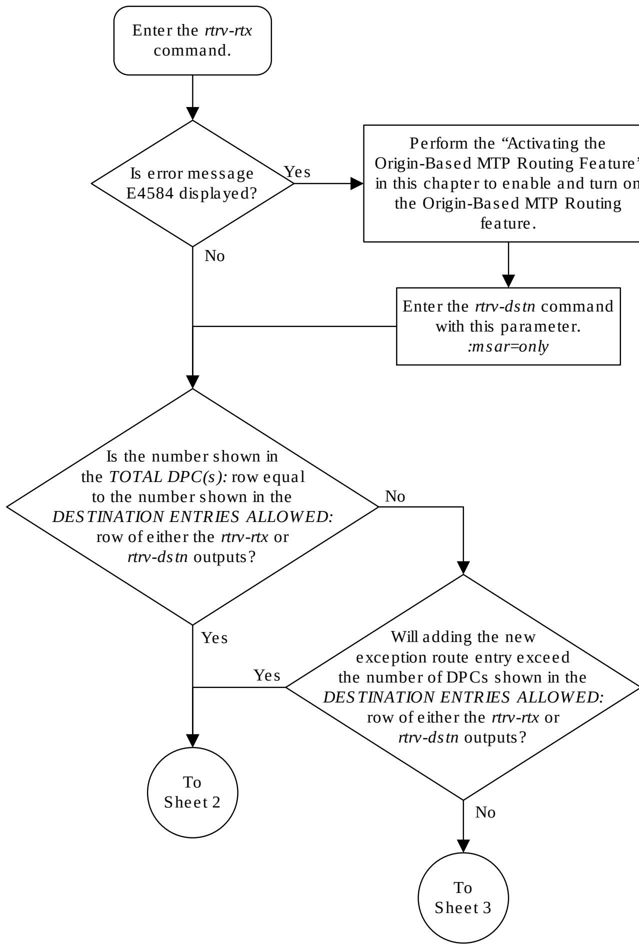
```
rlghncxa03w 08-02-11 08:28:30 GMT  EAGLE5 38.0.0

   DPCN          RTX-CRITERIA              LSN         RC     APC

   09852         CIC - ECIC
                 2000   3000               lsn15      45     11302

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

16. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

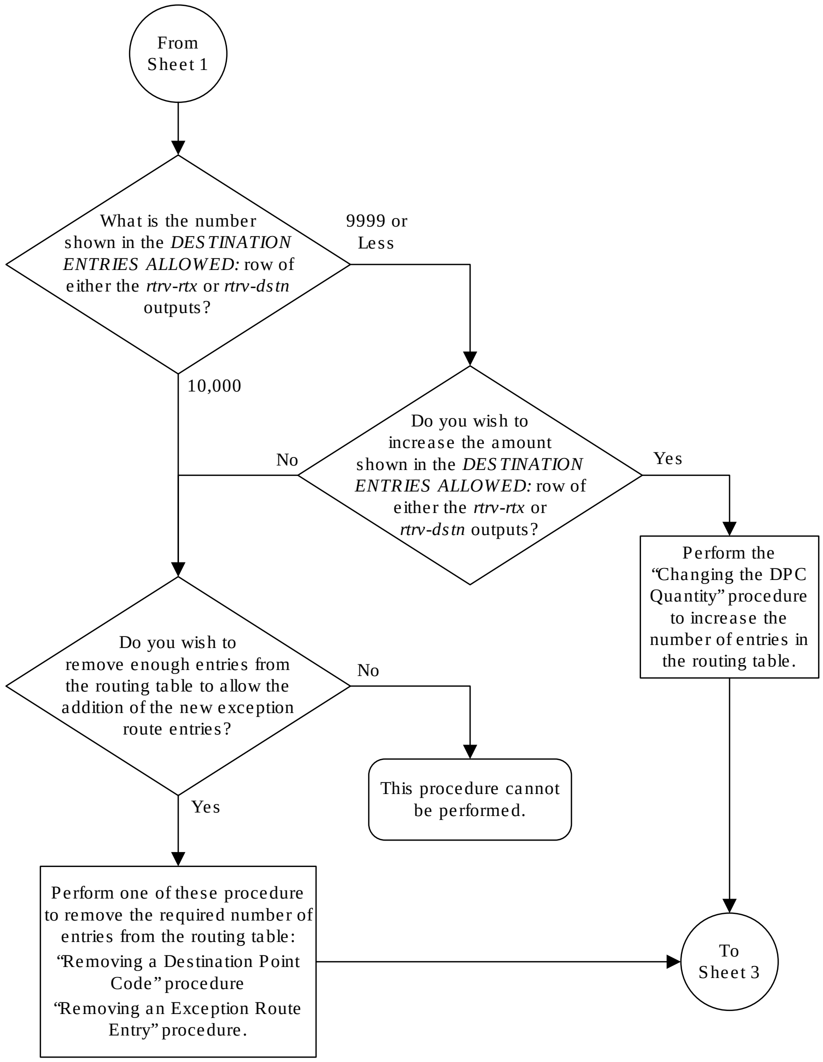
These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

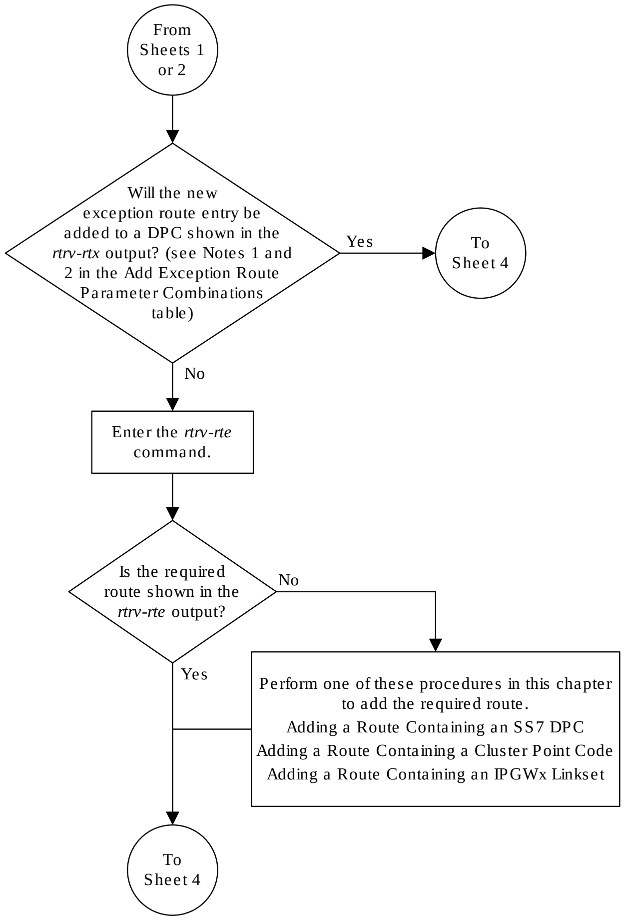
Figure 3-45 Adding an Exception Route Entry

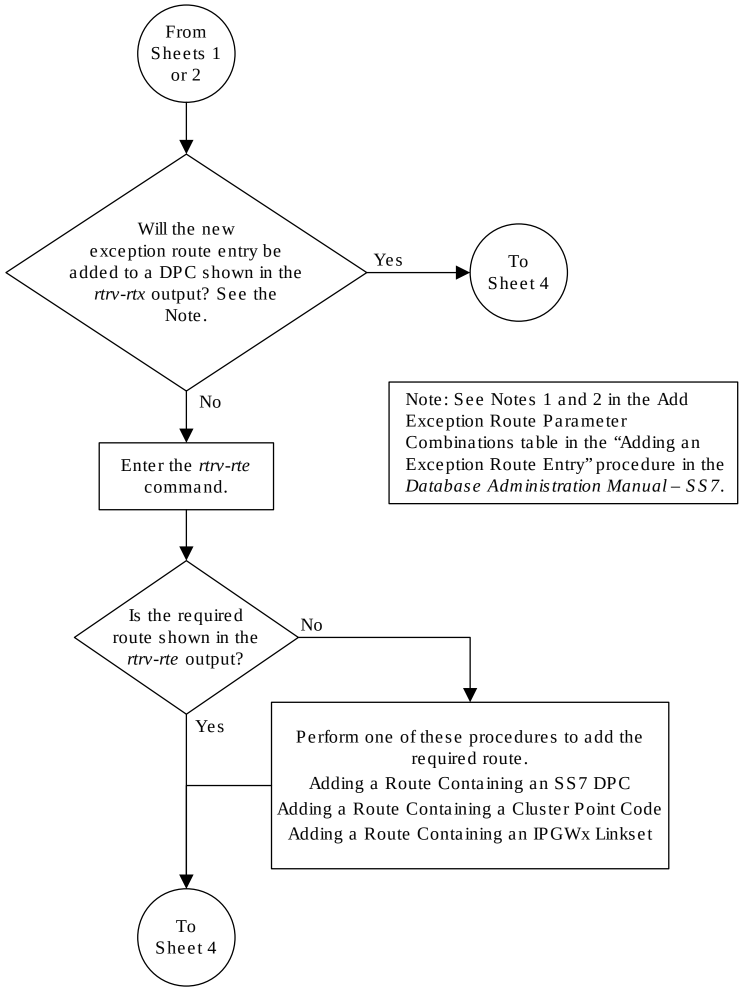


Sheet 1 of 10

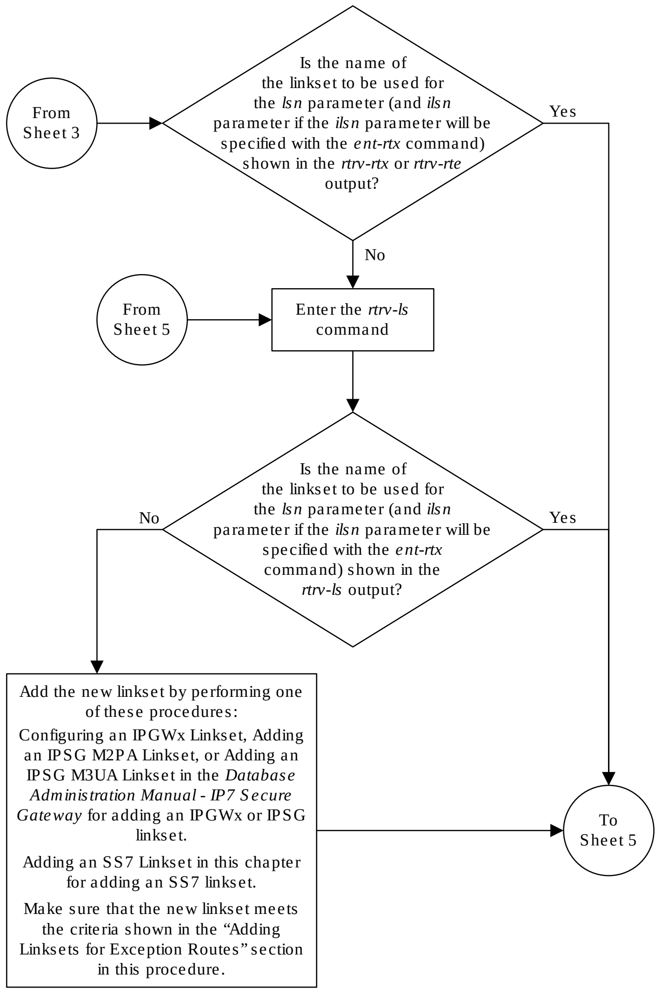

From Sheet 1
What is the number shown in the *DESTINATION ENTRIES ALLOWED:* row of either the *rtrv-rtx* or *rtrv-dstn* outputs?
9999 or Less
10,000
Do you wish to increase the amount shown in the *DESTINATION ENTRIES ALLOWED:* row of either the *rtrv-rtx* or *rtrv-dstn* outputs?
No
Yes
Perform the "Changing the DPC Quantity" procedure to increase the number of entries in the routing table.
Do you wish to remove enough entries from the routing table to allow the addition of the new exception route entries?
No
This procedure cannot be performed.
Yes
Perform one of these procedure to remove the required number of entries from the routing table:
"Removing a Destination Point Code" procedure
"Removing an Exception Route Entry" procedure.
To Sheet 3

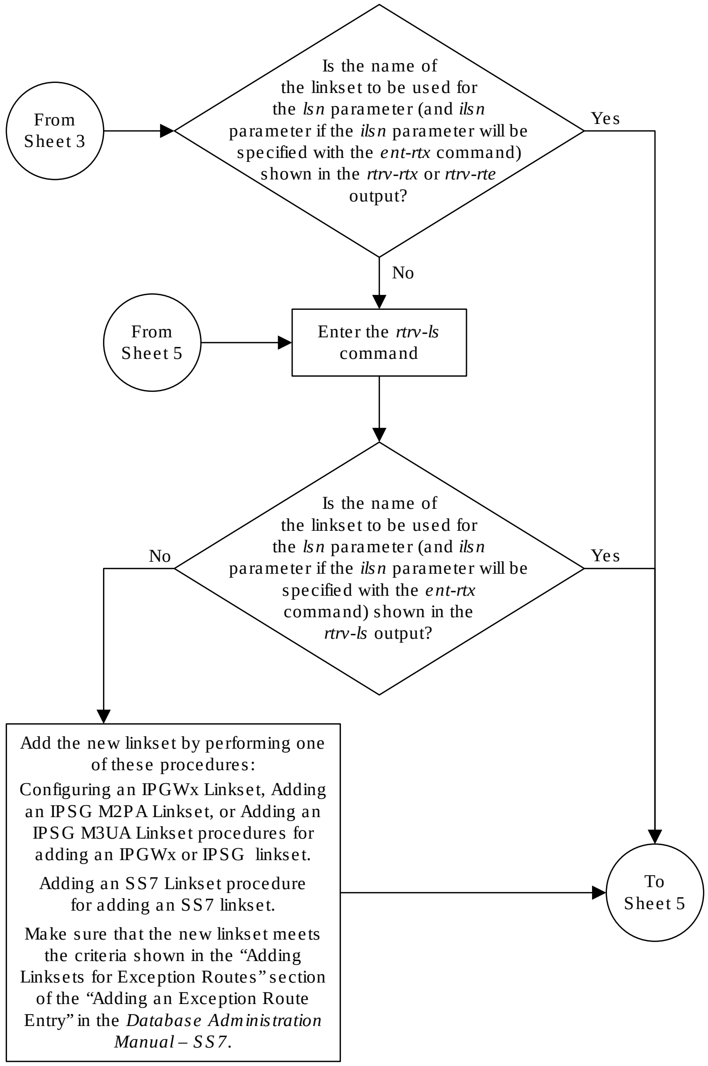
Sheet 2 of 10


From Sheets 1 or 2
Will the new exception route entry be added to a DPC shown in the *rtrv-rtx* output? (see Notes 1 and 2 in the Add Exception Route Parameter Combinations table)
Yes
To Sheet 4
No
Enter the *rtrv-rte* command.
Is the required route shown in the *rtrv-rte* output?
No
Perform one of these procedures in this chapter to add the required route.
Adding a Route Containing an SS7 DPC
Adding a Route Containing a Cluster Point Code
Adding a Route Containing an IPGWx Linkset
Yes
To Sheet 4

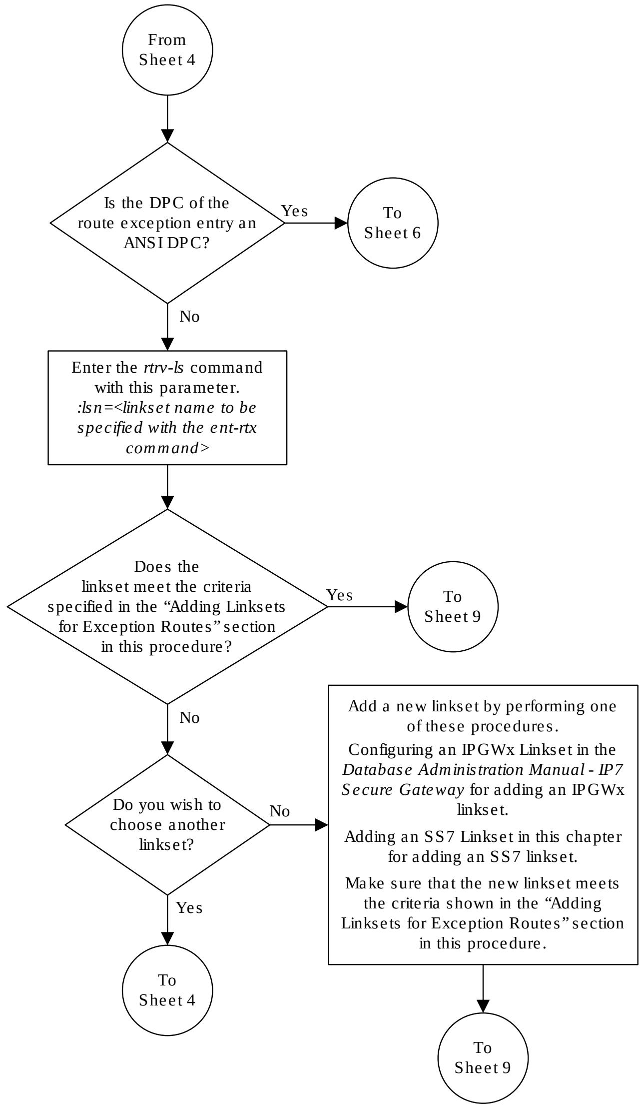

From Sheets 1 or 2
Will the new exception route entry be added to a DPC shown in the *rtrv-rtx* output? See the Note.
Yes
To Sheet 4
No
Note: See Notes 1 and 2 in the Add Exception Route Parameter Combinations table in the "Adding an Exception Route Entry" procedure in the *Database Administration Manual – SS7*.
Enter the *rtrv-rte* command.
Is the required route shown in the *rtrv-rte* output?
No
Perform one of these procedures to add the required route.
Adding a Route Containing an SS7 DPC
Adding a Route Containing a Cluster Point Code
Adding a Route Containing an IPGWx Linkset
Yes
To Sheet 4

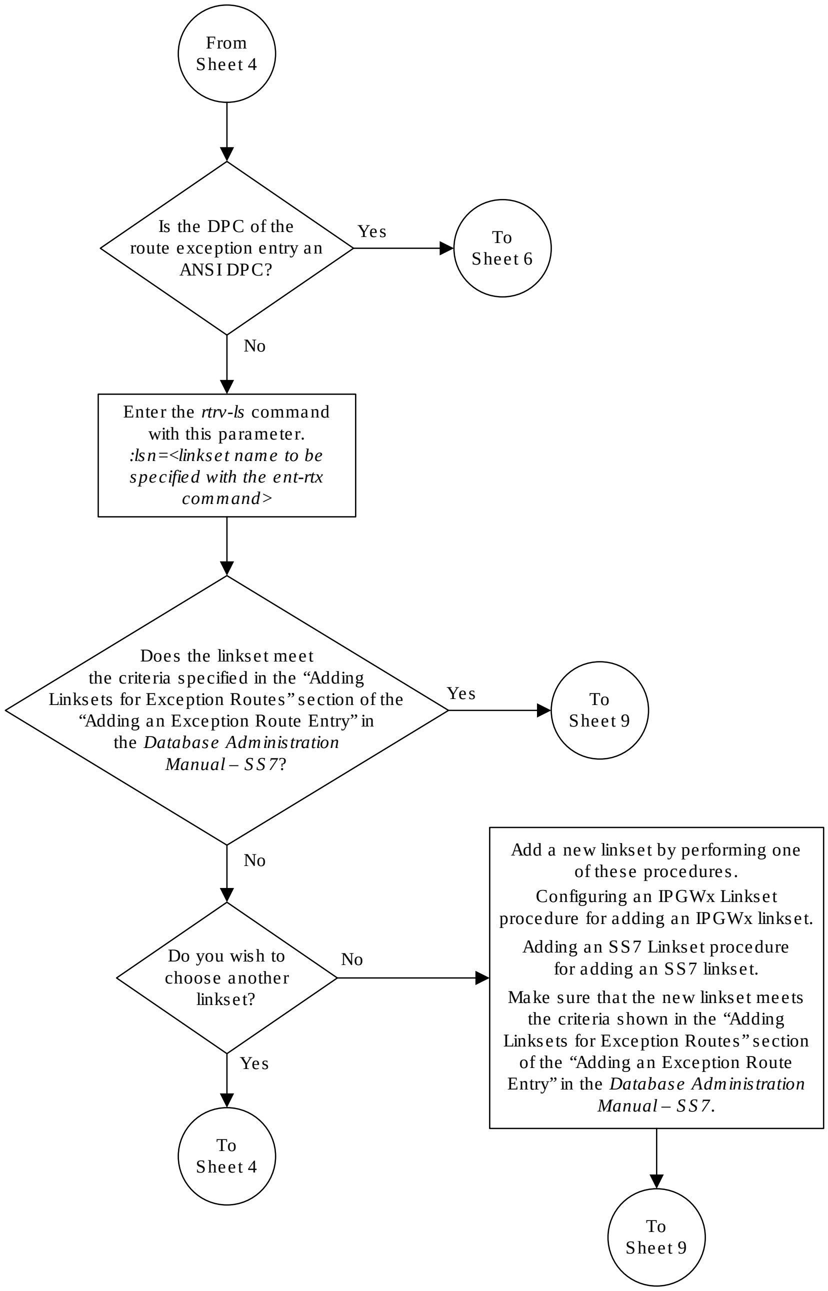
Sheet 3 of 10


From Sheet 3
Is the name of the linkset to be used for the lsn parameter (and ilsn parameter if the ilsn parameter will be specified with the ent-rtx command) shown in the rtrv-rtx or rtrv-rte output?
Yes
No
From Sheet 5
Enter the rtrv-ls command
Is the name of the linkset to be used for the lsn parameter (and ilsn parameter if the ilsn parameter will be specified with the ent-rtx command) shown in the rtrv-ls output?
No
Yes
Add the new linkset by performing one of these procedures:
Configuring an IPGWx Linkset, Adding an IPSG M2PA Linkset, or Adding an IPSG M3UA Linkset in the Database Administration Manual - IP7 Secure Gateway for adding an IPGWx or IPSG linkset.
Adding an SS7 Linkset in this chapter for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the "Adding Linksets for Exception Routes" section in this procedure.
To Sheet 5

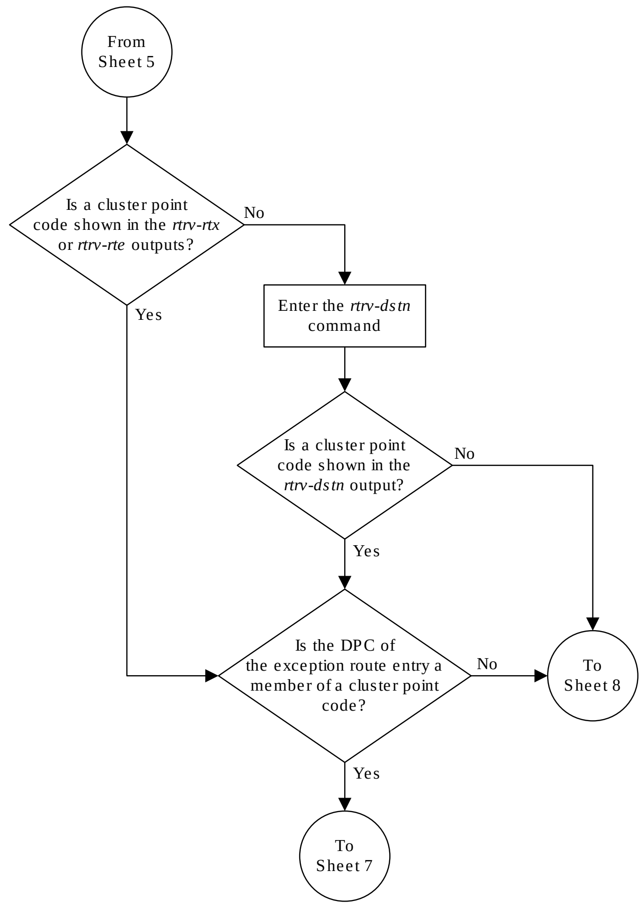

From Sheet 3
Is the name of the linkset to be used for the lsn parameter (and ilsn parameter if the ilsn parameter will be specified with the ent-rtx command) shown in the rtrv-rtx or rtrv-rte output?
Yes
No
From Sheet 5
Enter the rtrv-ls command
Is the name of the linkset to be used for the lsn parameter (and ilsn parameter if the ilsn parameter will be specified with the ent-rtx command) shown in the rtrv-ls output?
No
Yes
Add the new linkset by performing one of these procedures:
Configuring an IPGWx Linkset, Adding an IPSG M2PA Linkset, or Adding an IPSG M3UA Linkset procedures for adding an IPGWx or IPSG linkset.
Adding an SS7 Linkset procedure for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the “Adding Linksets for Exception Routes” section of the “Adding an Exception Route Entry” in the Database Administration Manual – SS7.
To Sheet 5

Sheet 4 of 10

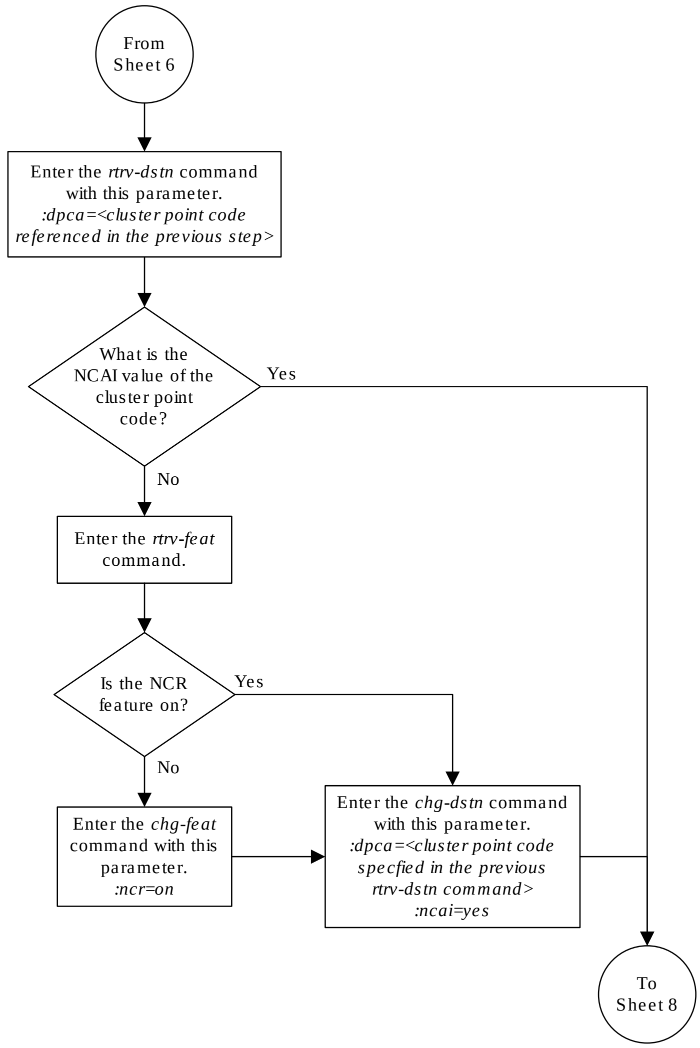

From Sheet 4
Is the DPC of the route exception entry an ANSI DPC?
Yes
To Sheet 6
No
Enter the rtrv-ls command with this parameter. :lsn=<linkset name to be specified with the ent-rtx command>
Does the linkset meet the criteria specified in the "Adding Linksets for Exception Routes" section in this procedure?
Yes
To Sheet 9
No
Do you wish to choose another linkset?
No
Add a new linkset by performing one of these procedures.
Configuring an IPGWx Linkset in the Database Administration Manual - IP7 Secure Gateway for adding an IPGWx linkset.
Adding an SS7 Linkset in this chapter for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the "Adding Linksets for Exception Routes" section in this procedure.
Yes
To Sheet 4
To Sheet 9


From Sheet 4
Is the DPC of the route exception entry an ANSI DPC?
Yes
To Sheet 6
No
Enter the rtrv-ls command with this parameter.
:lsn=<linkset name to be specified with the ent-rtx command>
Does the linkset meet the criteria specified in the "Adding Linksets for Exception Routes" section of the "Adding an Exception Route Entry" in the Database Administration Manual – SS7?
Yes
To Sheet 9
No
Do you wish to choose another linkset?
No
Add a new linkset by performing one of these procedures.
Configuring an IPGWx Linkset procedure for adding an IPGWx linkset.
Adding an SS7 Linkset procedure for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the "Adding Linksets for Exception Routes" section of the "Adding an Exception Route Entry" in the Database Administration Manual – SS7.
Yes
To Sheet 4
To Sheet 9

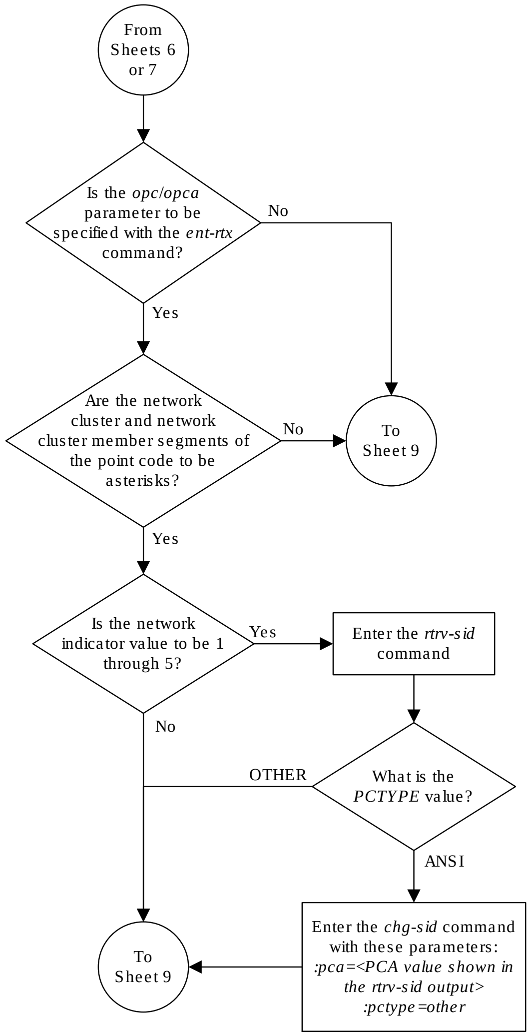
Sheet 5 of 10


From Sheet 5
Is a cluster point code shown in the rtrv-rtx or rtrv-rte outputs?
No
Yes
Enter the rtrv-dstn command
Is a cluster point code shown in the rtrv-dstn output?
No
Yes
Is the DPC of the exception route entry a member of a cluster point code?
No
Yes
To Sheet 8
To Sheet 7

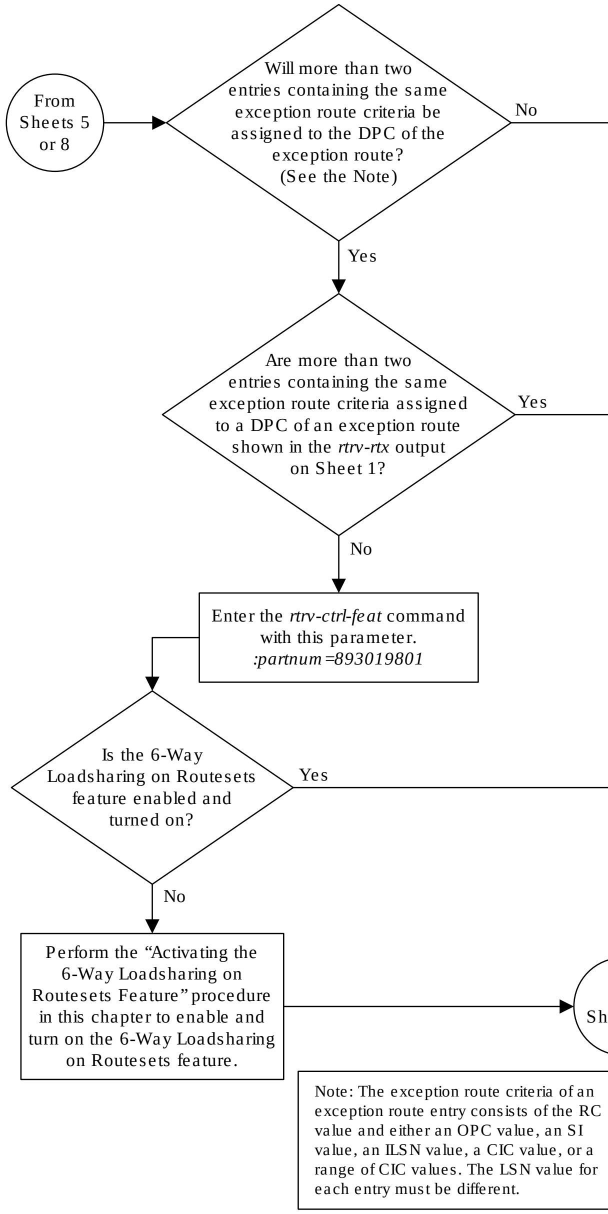
Sheet 6 of 10

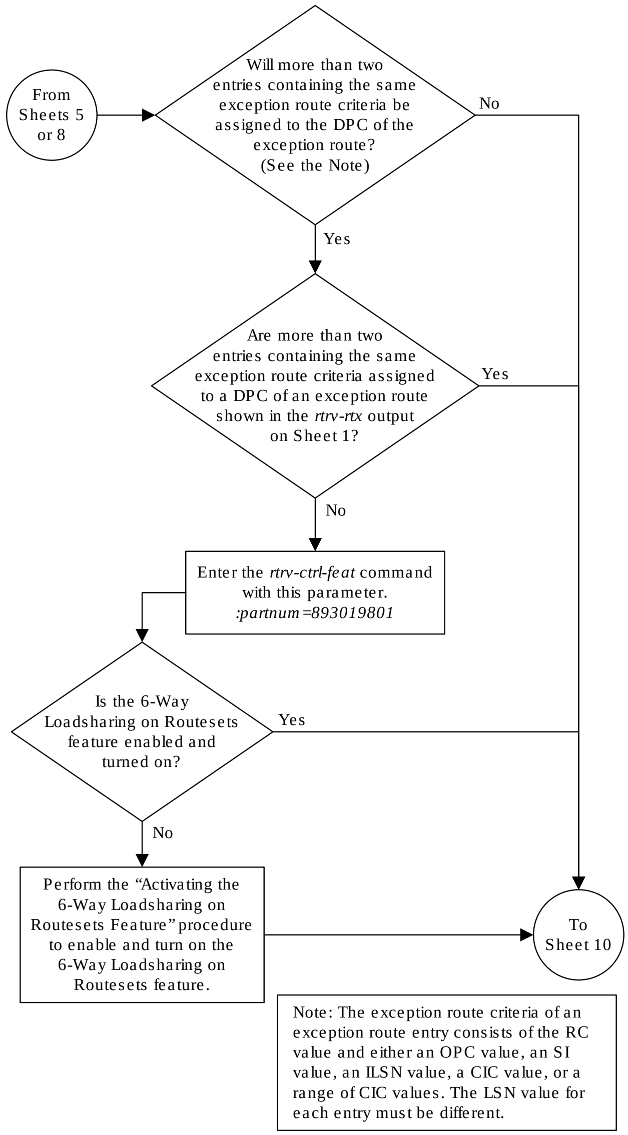

From
Sheet 6
Enter the rtrv-dstn command
with this parameter.
:dpca=<cluster point code
referenced in the previous step>
What is the
NCAI value of the
cluster point
code?
Yes
No
Enter the rtrv-feat
command.
Is the NCR
feature on?
Yes
No
Enter the chg-feat
command with this
parameter.
:ncr=on
Enter the chg-dstn command
with this parameter.
:dpca=<cluster point code
specfied in the previous
rtrv-dstn command>
:ncai=yes
To
Sheet 8

Sheet 7 of 10

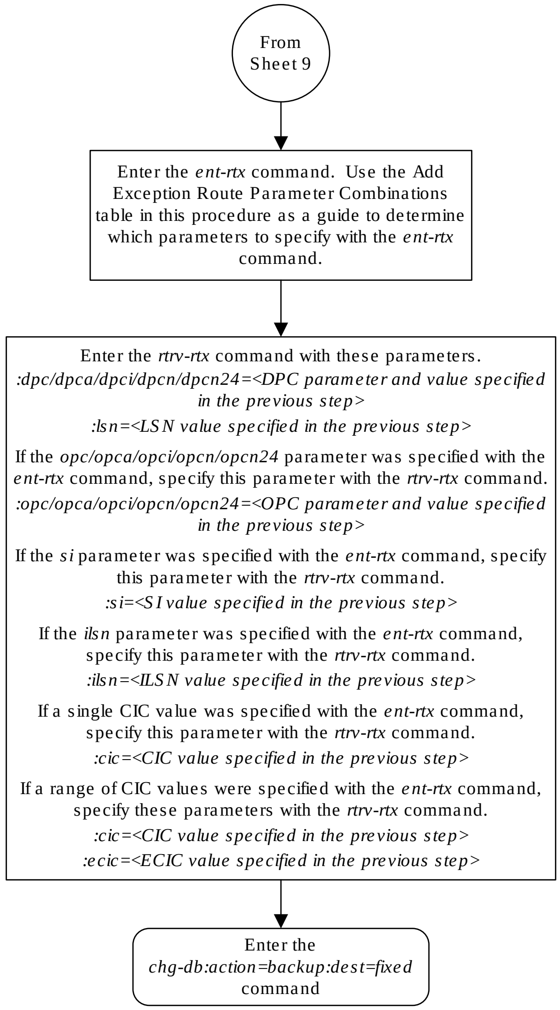

From Sheets 6 or 7
Is the opc/opca parameter to be specified with the ent-rtx command?
No
Yes
Are the network cluster and network cluster member segments of the point code to be asterisks?
No
To Sheet 9
Yes
Is the network indicator value to be 1 through 5?
Yes
Enter the rtrv-sid command
No
OTHER
What is the PCTYPE value?
ANSI
To Sheet 9
Enter the chg-sid command with these parameters:
:pca=<PCA value shown in the rtrv-sid output>
:pctype=other

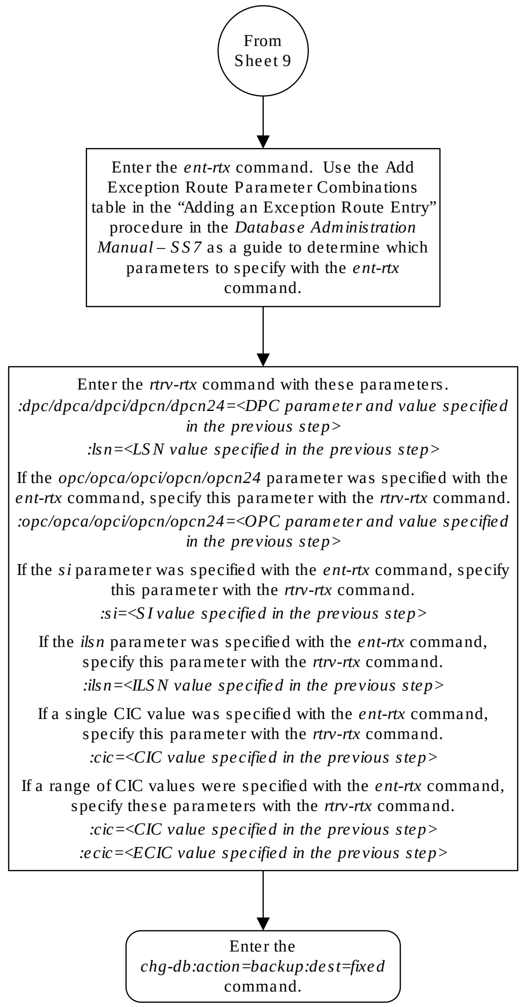
Sheet 8 of 10


From Sheets 5 or 8
Will more than two entries containing the same exception route criteria be assigned to the DPC of the exception route? (See the Note)
No
Yes
Are more than two entries containing the same exception route criteria assigned to a DPC of an exception route shown in the rtrv-rtx output on Sheet 1?
Yes
No
Enter the rtrv-ctrl-feat command with this parameter. :partnum=893019801
Is the 6-Way Loadsharing on Routesets feature enabled and turned on?
Yes
No
Perform the "Activating the 6-Way Loadsharing on Routesets Feature" procedure in this chapter to enable and turn on the 6-Way Loadsharing on Routesets feature.
To Sheet 10
Note: The exception route criteria of an exception route entry consists of the RC value and either an OPC value, an SI value, an ILSN value, a CIC value, or a range of CIC values. The LSN value for each entry must be different.


From Sheets 5 or 8
Will more than two entries containing the same exception route criteria be assigned to the DPC of the exception route? (See the Note)
No
Yes
Are more than two entries containing the same exception route criteria assigned to a DPC of an exception route shown in the *rtrv-rtx* output on Sheet 1?
Yes
No
Enter the *rtrv-ctrl-feat* command with this parameter. *:partnum=893019801*
Is the 6-Way Loadsharing on Routesets feature enabled and turned on?
Yes
No
Perform the "Activating the 6-Way Loadsharing on Routesets Feature" procedure to enable and turn on the 6-Way Loadsharing on Routesets feature.
To Sheet 10
Note: The exception route criteria of an exception route entry consists of the RC value and either an OPC value, an SI value, an ILSN value, a CIC value, or a range of CIC values. The LSN value for each entry must be different.

Sheet 9 of 10


From Sheet 9
Enter the ent-rtx command. Use the Add Exception Route Parameter Combinations table in this procedure as a guide to determine which parameters to specify with the ent-rtx command.
Enter the rtrv-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC parameter and value specified in the previous step>
:lsn=<LSN value specified in the previous step>
If the opc/opca/opci/opcn/opcn24 parameter was specified with the ent-rtx command, specify this parameter with the rtrv-rtx command.
:opc/opca/opci/opcn/opcn24=<OPC parameter and value specified in the previous step>
If the si parameter was specified with the ent-rtx command, specify this parameter with the rtrv-rtx command.
:si=<SI value specified in the previous step>
If the ilsn parameter was specified with the ent-rtx command, specify this parameter with the rtrv-rtx command.
:ilsn=<ILSN value specified in the previous step>
If a single CIC value was specified with the ent-rtx command, specify this parameter with the rtrv-rtx command.
:cic=<CIC value specified in the previous step>
If a range of CIC values were specified with the ent-rtx command, specify these parameters with the rtrv-rtx command.
:cic=<CIC value specified in the previous step>
:ecic=<ECIC value specified in the previous step>
Enter the chg-db:action=backup:dest=fixed command



Sheet 10 of 10

3.42 Removing a Route Exception Entry

This procedure is used to remove an exception route from the database using the `dlt-rtx` command. The `dlt-rtx` command uses these parameters.

`:dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` – The destination point code of the node that the traffic is being sent to.

`:opc`/`opca`/`opci`/`opcn`/`opcn24` – The originating point code of the node sending traffic to the **EAGLE**.

`:ilsn` – The name of the linkset carrying incoming traffic to the **EAGLE**.

`:lsn` – The name of the linkset carrying the traffic to the node specified by the destination point code.

`:si` – The service indicator value assigned to the exception route.

`:cic` – The circuit identification code value assigned to an exception route containing a single **CIC** entry or the **CIC** value that begins a range of **CICs** assigned to the exception route.

`:ecic` – The circuit identification code value that ends the range of **CICs** assigned to the exception route.

`:all` – This parameter, along with the `force=yes` parameter, allows all the exception routes containing the exception route criteria, **OPC**, **ILSN**, **SI**, **CIC**, **CIC** and **ECIC**, to be removed from the database. This parameter has only one value, `yes`.

`:force` – This parameter, along with the `all=yes` parameter, allows all the exception routes containing the exception route criteria, **OPC**, **ILSN**, **SI**, **CIC**, **CIC** and **ECIC**, to be removed from the database. This parameter has only one value, `yes`.

The values of all the parameters specified for the `dlt-rtx` command, except the `all=yes` and `force=yes` parameters, must be shown in the `rtrv-rtx` output and must be assigned to the specified `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` value.

The combinations of these parameters that can be used with the `dlt-rtx` command are shown in Table 3-28.

1. Display the exception routes in the database by entering the `rtrv-rtx` command. This is an example of the possible output.

```
rlghncxa03w 06-10-07 11:43:04 GMT  EAGLE5 36.0.0

   DPCA           RTX-CRITERIA              LSN        RC     APC

   003-003-003    OPCA
                  009-009-009               lsn1       3      002-002-002
                  010-010-010               lsn1       2      002-002-002
                  010-010-010               lsn2       10     002-002-003

                  ILSN
                  lsn3                      lsn2       2      002-002-003
                  lsn4                      lsn2       1      002-002-003
                  lsn4                      lsn1       10     002-002-002

                  CIC - ECIC
                  15    15                  lsn2       1      002-002-003
                  17    17                  lsn2       7      002-002-003
                  17    17                  lsn1       10     002-002-002
                  18    30                  lsn1       8      002-002-002
                  18    30                  lsn2       10     002-002-003

                  SI
                  3                         lsn2       5      002-002-003
                  3                         lsn1       10     002-002-002
```

```
                  5                         lsn2       5
002-002-003

   006-006-006    OPCA
                  125-150-175               lsn11      10
004-004-004

                  OPCI
                  2-103-1                   lsn11      20
004-004-004

                  ILSN
                  lsn12                     lsn11      11
004-004-004
                  lsn13                     lsn11      12
004-004-004

                  CIC - ECIC
                  250   250                 lsn12      15
005-005-005
                  300   500                 lsn12      25
005-005-005

                  SI
                  5                         lsn12      10
005-005-005

   DPCI           RTX-CRITERIA              LSN        RC     APC

   0-123-7        OPCI
                  1-222-3                   lsn3       10     1-234-5
                  1-222-4                   lsn3       11     1-234-5
                  1-222-5                   lsn4       11     2-145-6

   3-025-6        OPCA
                  135-102-089               lsn13      10     1-100-5

                  OPCI
                  4-054-0                   lsn13      15     1-100-5

                  OPCN
                  00503                     lsn11      15     1-100-5

                  ILSN
                  lsn2                      lsn14      45     4-139-4
                  lsn4                      lsn13      25     1-100-5
                  lsn16                     lsn16      50     12567

                  CIC - ECIC
                  100   100                 lsn14      35     4-139-4
                  50    75                  lsn13      40     1-100-5

                  SI
                  3                         lsn13      30     1-100-5
```

```
   DPCN          RTX-CRITERIA              LSN         RC     APC
   09852         OPCA
                 127-063-048               lsn15       10     11302

                 OPCI
                 3-037-1                   lsn16       15     12567

                 OPCN
                 00409                     lsn13       20     1-100-5

                 ILSN
                 lsn13                     lsn15       25     11302
                 lsn4                      lsn16       30     12567

                 CIC - ECIC
                 1000  1000                lsn16       40     12567
                 2000  3000                lsn15       45     11302

                 SI
                 4                         lsn15       35     11302

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              41
    TOTAL DPC(s):                  61
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

2. Remove the exception route entry by entering the `dlt-rtx` command and specifying the parameter combinations shown in Table 3-28 for the exception route criteria being assigned to the exception route.

Table 3-28 Remove Exception Route Parameter Combinations

Exception Route Criteria				
:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route shown in the `rtrv-rtx` output	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route shown in the `rtrv-rtx` output	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route shown in the `rtrv-rtx` output	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route shown in the `rtrv-rtx` output	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route shown in the `rtrv-rtx` output
:opc/opca/ opci/opcn/ opcn24 = **OPC** value of the exception route assigned to the **DPC** value	:ilsn = incoming linkset name of the exception route assigned to the **DPC** value	:si = service indicator value of the exception route assigned to the **DPC** value	:cic = circuit identification code value of the exception route assigned to the **DPC** value	:cic = the circuit identification code value beginning a range of **CICs** of the exception route assigned to the **DPC** value

Table 3-28 (Cont.) Remove Exception Route Parameter Combinations

Exception Route Criteria				
:lsn = linkset name of the exception route assigned to the **DPC** value (See Notes)	:lsn = linkset name of the exception route assigned to the **DPC** value (See Notes)	:lsn = linkset name of the exception route assigned to the **DPC** value (See Notes)	:lsn = linkset name shown of the exception route assigned to the **DPC** value (See Notes)	:ecic = the circuit identification code value ending a range of **CICs** of the exception route assigned to the **DPC** value
:force=yes (See Notes)	:force=yes (See Notes)	:force=yes (See Notes)	:force=yes (See Notes)	:lsn = linkset name shown of the exception route assigned to the **DPC** value (See Notes)
:all=yes (See Notes)	:all=yes (See Notes)	:all=yes (See Notes)	:all=yes (See Notes)	:force=yes (See Notes) :all=yes (See Notes)

Note:

a. The `all=yes` and `force=yes` parameter cannot be specified with the `lsn` parameter. If the `all=yes` parameter is specified, the `force=yes` parameter must be specified.

b. If the exception route entry being removed contains only one entry for the specified exception route criteria, the `all=yes` and `force=yes` parameters can be specified, but do not have to be specified. If the `all=yes` and `force=yes` parameters are not specified, the `lsn` parameter must be specified.

For this example, enter these commands to remove a single entry for a specific exception route criteria.

```
dlt-rtx:dpca=003-003-003:opca=010-010-010:lsn=lsn1
```

```
dlt-rtx:dpca=003-003-003:ilsn=lsn4:lsn=lsn2
```

```
dlt-rtx:dpca=003-003-003:cic=17:lsn=lsn2
```

```
dlt-rtx:dpca=003-003-003:cic=18:ecic=30:lsn=lsn2
```

```
dlt-rtx:dpca=003-003-003:si=3:lsn=lsn1
```

To remove all the entries for a specific exception route criteria, for this example enter these commands.

```
dlt-rtx:dpca=003-003-003:opca=010-010-010:all=yes:force=yes
```

```
dlt-rtx:dpca=003-003-003:ilsn=lsn4:all=yes:force=yes
```

```
dlt-rtx:dpca=003-003-003:cic=17:all=yes:force=yes
```

```
dlt-rtx:dpca=003-003-003:cic=18:ecic=30:all=yes:force=yes
```

```
dlt-rtx:dpca=003-003-003:si=3:all=yes:force=yes
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
DLT-RTX: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-rtx` command, specifying these parameters depending on the parameters specified in 2.
   a. If the `ilsn` and `lsn` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `ilsn`, and `lsn`.
   b. If the `si` and `lsn` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `si`, and `lsn`.
   c. If only the `cic` and `lsn` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `cic`, and `lsn`.
   d. If the `cic` and `ecic` and `lsn` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `cic`, `ecic`, and `lsn`.
   e. If the `opc/opca/opci/opcn/opcn24`, `all=yes`, and `force=yes` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24` and `opc/opca/opci/opcn/opcn24`.
   f. If the `ilsn`, `all=yes`, and `force=yes` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24` and `ilsn`.
   g. If the `si`, `all=yes`, and `force=yes` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24` and `si`.
   h. If only the `cic`, `all=yes`, and `force=yes` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24` and `cic`.
   i. If the `cic`, `ecic`, `all=yes`, and `force=yes` parameters were specified in 2 - enter these parameters and values specified in 2 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `cic`, and `ecic`.

For this example, if a single entry for the specified exception route criteria was removed in step 2, enter these commands.

`rtrv-rtx:dpca=003-003-003:opca=010-010-010:lsn=lsn1`

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              31
```

```
    TOTAL DPC(s):                  51
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=003-003-003:ilsn=lsn4:lsn=lsn2
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              31
    TOTAL DPC(s):                  51
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=003-003-003:cic=17:lsn=lsn2
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              31
    TOTAL DPC(s):                  51
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=003-003-003:cic=18:ecic=30:lsn=lsn2
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              31
    TOTAL DPC(s):                  51
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpca=003-003-003:si=3:lsn=lsn1
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
DESTINATION ENTRIES ALLOCATED:   2000
```

```
    FULL DPC(s):                20
    EXCEPTION DPC(s):           31
    TOTAL DPC(s):               51
    CAPACITY (% FULL):           3%
ALIASES ALLOCATED:           12000
    ALIASES USED:                0
    CAPACITY (% FULL):           0%
```

For this example, if multiple entries for a specific exception route criteria were removed in step 2, enter these commands.

```
rtrv-rtx:dpca=003-003-003:opca=010-010-010
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                20
    EXCEPTION DPC(s):           26
    TOTAL DPC(s):               46
    CAPACITY (% FULL):           2%
ALIASES ALLOCATED:           12000
    ALIASES USED:                0
    CAPACITY (% FULL):           0%
```

```
rtrv-rtx:dpca=003-003-003:ilsn=lsn4
```

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                20
    EXCEPTION DPC(s):           26
    TOTAL DPC(s):               46
    CAPACITY (% FULL):           2%
ALIASES ALLOCATED:           12000
    ALIASES USED:                0
    CAPACITY (% FULL):           0%
```

```
rtrv-rtx:dpca=003-003-003:cic=17
```

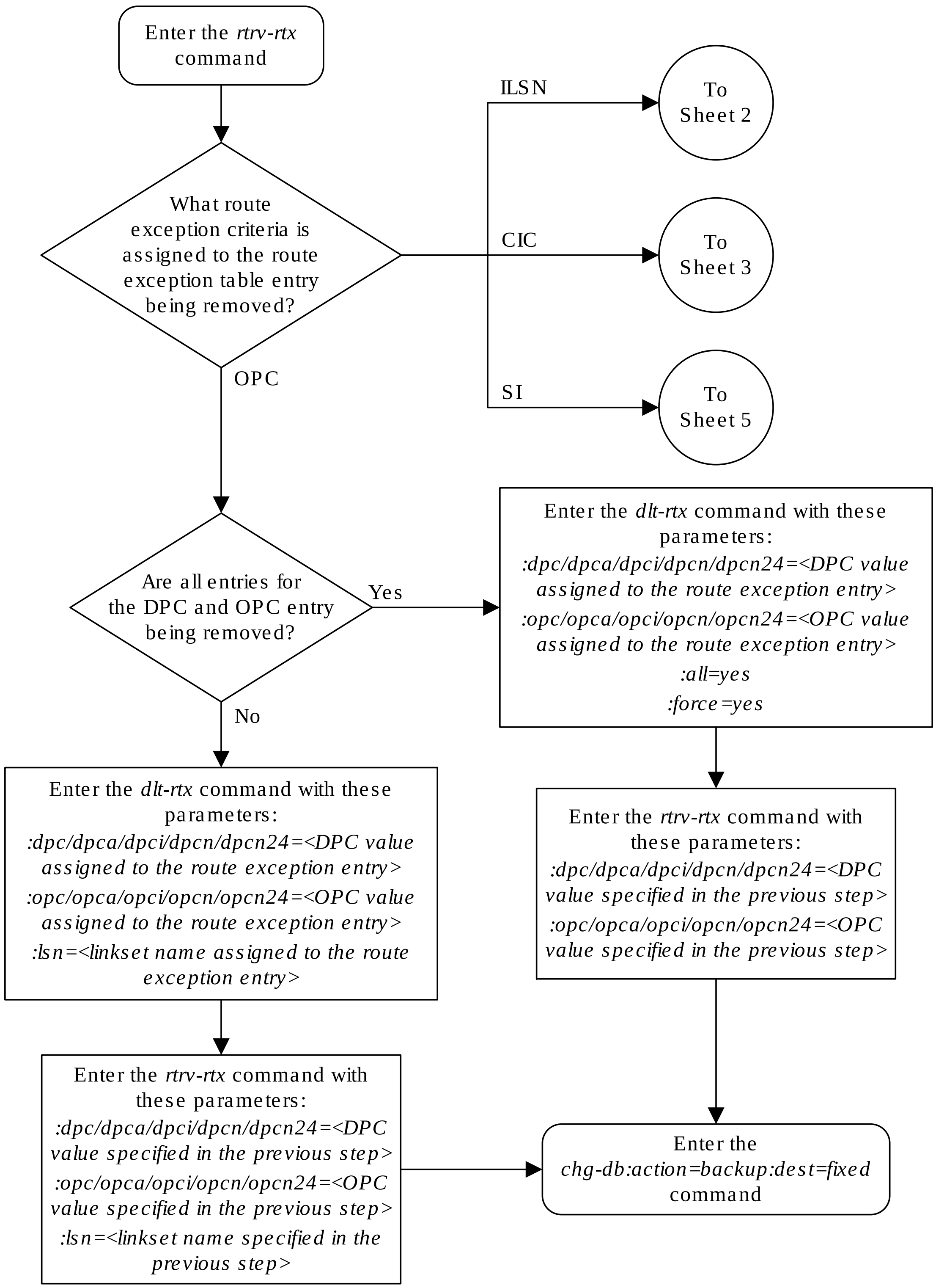
```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                20
    EXCEPTION DPC(s):           26
    TOTAL DPC(s):               46
    CAPACITY (% FULL):           2%
ALIASES ALLOCATED:           12000
    ALIASES USED:                0
    CAPACITY (% FULL):           0%
```

```
rtrv-rtx:dpca=003-003-003:cic=18:ecic=30


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              26
    TOTAL DPC(s):                  46
    CAPACITY (% FULL):              2%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpca=003-003-003:si=3


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              26
    TOTAL DPC(s):                  46
    CAPACITY (% FULL):              2%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

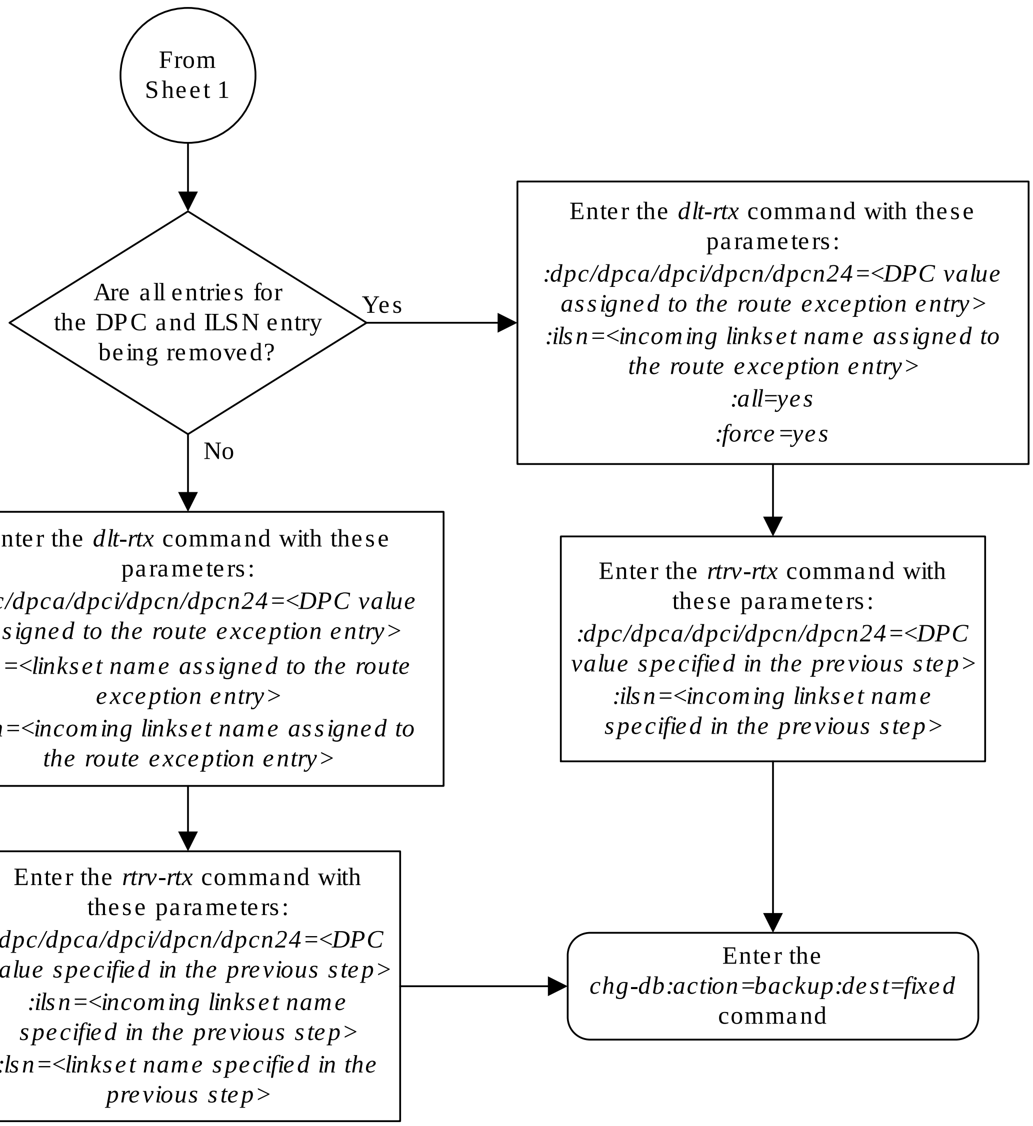
4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

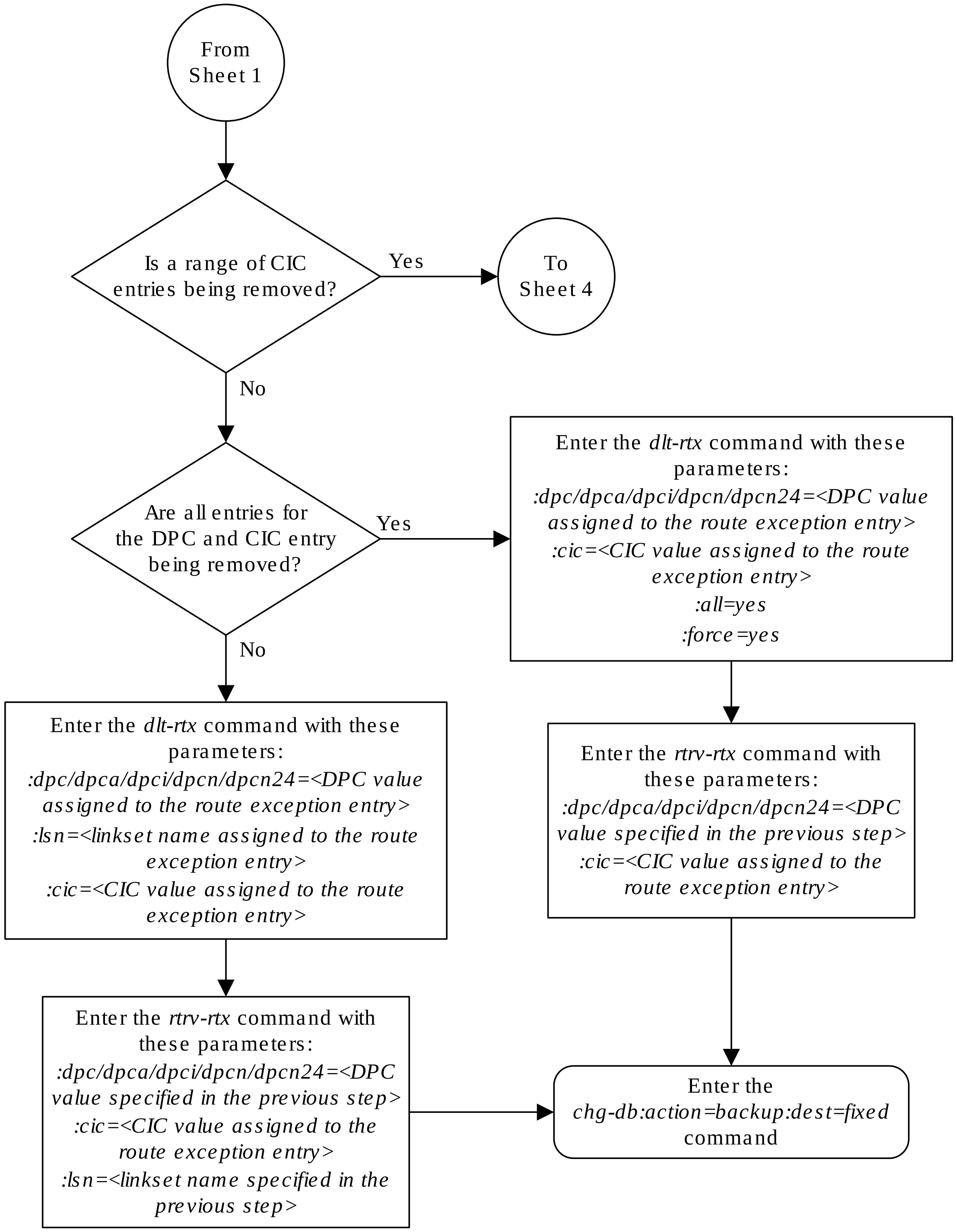
Figure 3-46 Removing a Route Exception Entry



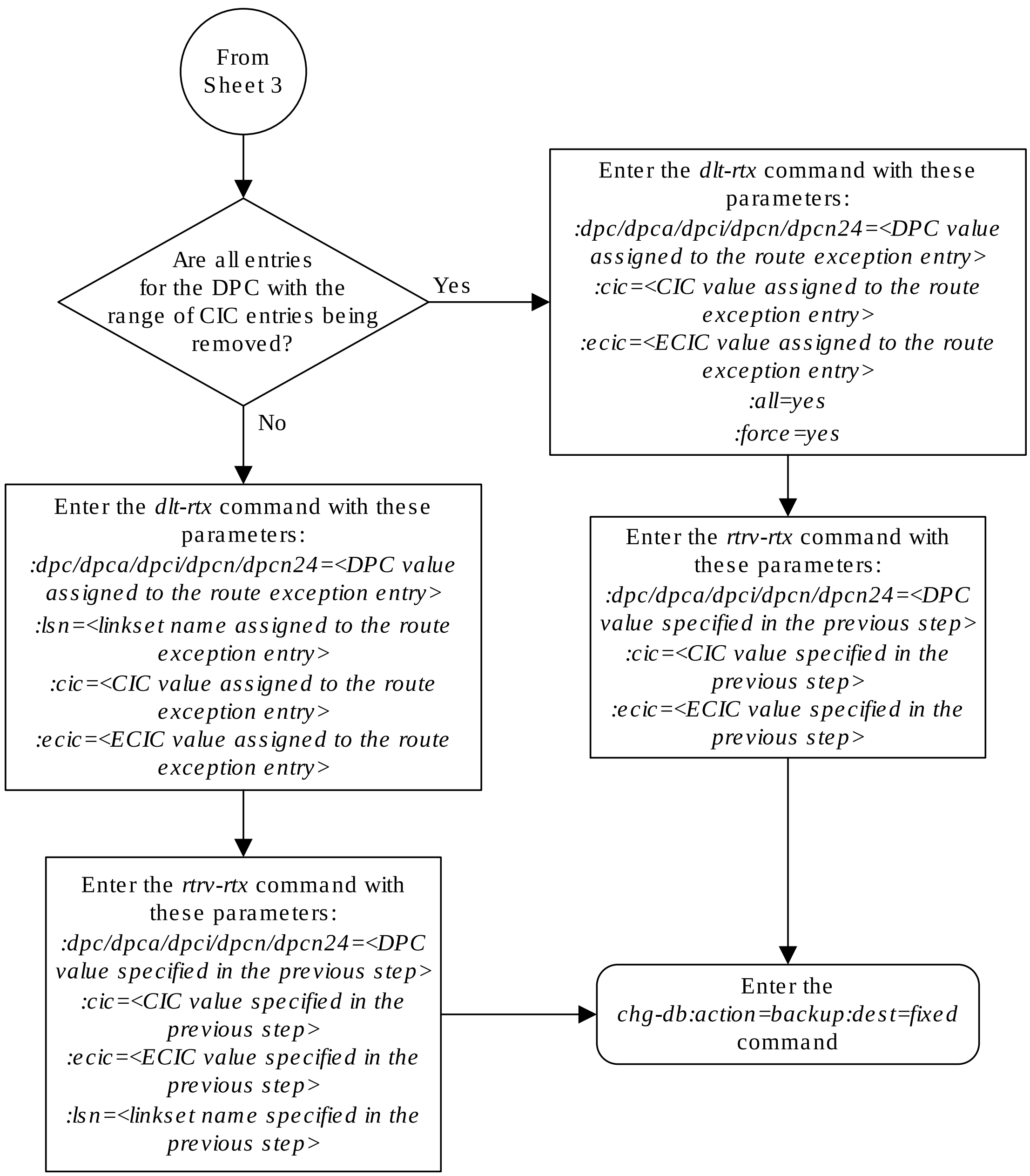
Sheet 1 of 5


From Sheet 1
Are all entries for the DPC and ILSN entry being removed?
Yes
No
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:ilsn=<incoming linkset name assigned to the route exception entry>
:all=yes
:force=yes
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
:ilsn=<incoming linkset name assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:ilsn=<incoming linkset name specified in the previous step>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:ilsn=<incoming linkset name specified in the previous step>
:lsn=<linkset name specified in the previous step>
Enter the chg-db:action=backup:dest=fixed command

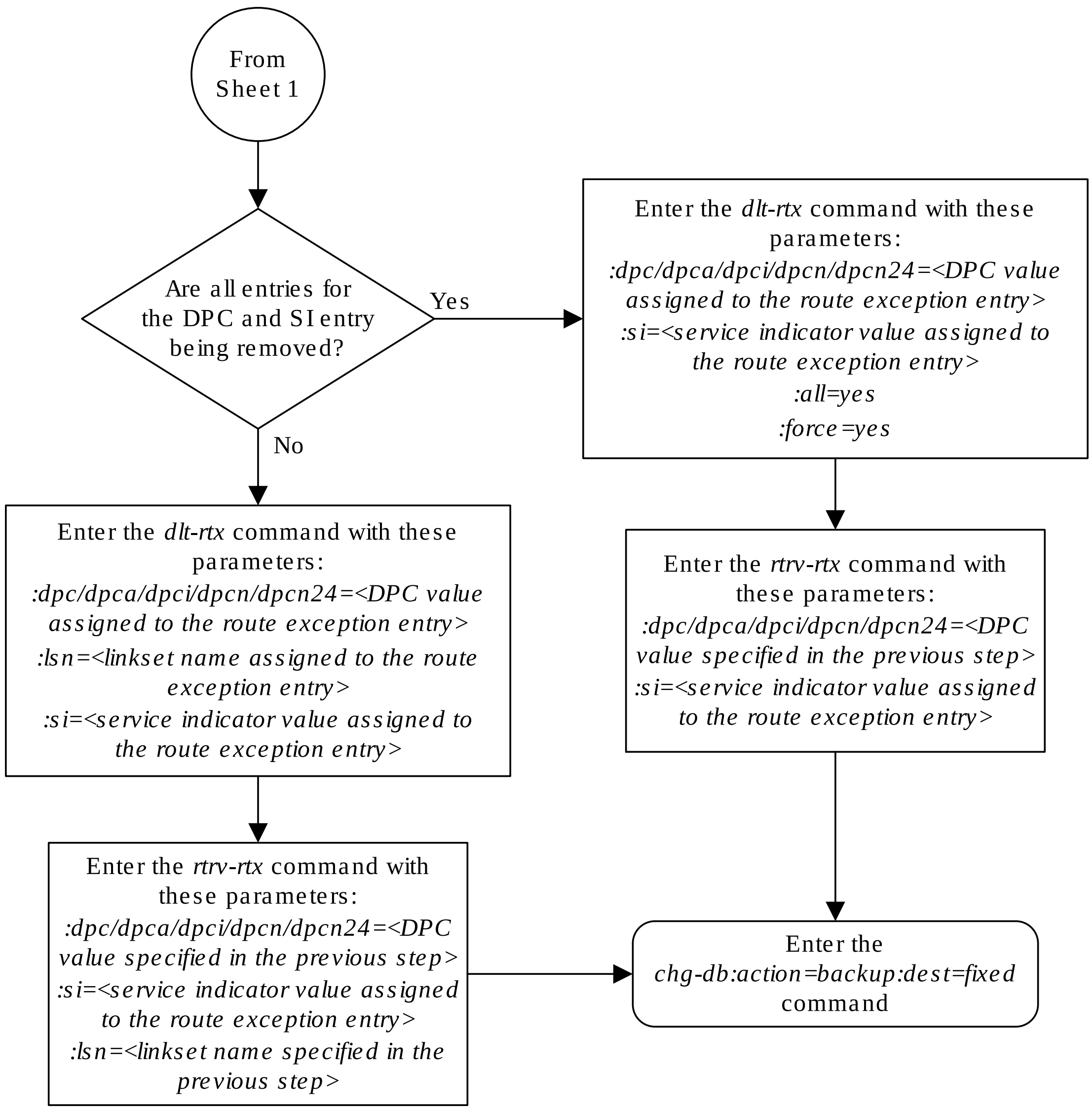
Sheet 2 of 5


From Sheet 1
Is a range of CIC entries being removed?
Yes
To Sheet 4
No
Are all entries for the DPC and CIC entry being removed?
Yes
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
:all=yes
:force=yes
No
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value assigned to the route exception entry>
:lsn=<linkset name specified in the previous step>
Enter the chg-db:action=backup:dest=fixed command

Sheet 3 of 5


From Sheet 3
Are all entries for the DPC with the range of CIC entries being removed?
Yes
No
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
:ecic=<ECIC value assigned to the route exception entry>
:all=yes
:force=yes
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
:ecic=<ECIC value assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value specified in the previous step>
:ecic=<ECIC value specified in the previous step>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value specified in the previous step>
:ecic=<ECIC value specified in the previous step>
:lsn=<linkset name specified in the previous step>
Enter the chg-db:action=backup:dest=fixed command

Sheet 4 of 5


From Sheet 1
Are all entries for the DPC and SI entry being removed?
Yes
No
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:si=<service indicator value assigned to the route exception entry>
:all=yes
:force=yes
Enter the dlt-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
:si=<service indicator value assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:si=<service indicator value assigned to the route exception entry>
Enter the rtrv-rtx command with these parameters:
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:si=<service indicator value assigned to the route exception entry>
:lsn=<linkset name specified in the previous step>
Enter the chg-db:action=backup:dest=fixed command

Sheet 5 of 5

3.43 Changing a Route Exception Entry

This procedure is used to change the attributes of an exception route in the database using the `chg-rtx` command. The attributes of the exception route that can be changed are the linkset (`lsn` parameter) and the relative cost (`rc` parameter) of the exception route.

The `chg-rtx` command uses these parameters.

`:dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` – The destination point code of the node that the traffic is being sent to.

`:opc`/`opca`/`opci`/`opcn`/`opcn24` – The originating point code of the node sending traffic to the **EAGLE** 5 **ISS**.

`:ilsn` – The name of the linkset carrying incoming traffic to the **EAGLE**.

`:lsn` – The name of the linkset that carries the traffic to the node specified by the destination point code.

`:si` – The service indicator value assigned to the exception route.

`:cic` – The circuit identification code value assigned to an exception route containing a single **CIC** entry or the **CIC** value that begins a range of **CICs** assigned to the exception route.

`:ecic` – The circuit identification code value that ends the range of **CICs** assigned to the exception route.

`:rc` – The new relative cost value (priority) that will be assigned to the exception route. The value of the `rc` parameter is 0 to 99.

`:nlsn` – The name of the new linkset that will carry the traffic to the node specified by the destination point code.

`:force` – This parameter allows the exception route to be changed even if the `ilsn` parameter value is the same as the `nlsn` parameter value. This parameter has only one value, `yes`.

The values of all the parameters specified for the `chg-rtx` command, except the `rc`, `nlsn`, and `force=yes` parameters, must be shown in the `rtrv-rtx` output and must be assigned to the specified `dpc`/`dpca`/`dpci`/`dpcn`/`dpcn24` value.

The combinations of these parameters that can be used with the `chg-rtx` command are shown in Table 3-29 .

The names of the linksets required specified for the `nlsn` parameter must be provisioned in the database. This can be verified by entering the `rtrv-ls` command. If the required linkset is not in the database, perform one of these procedures to add the linkset.

- Adding an SS7 Linkset
- “Adding an X.25 Linkset” procedure in *Database Administration - Features User's Guide*

- “Configuring an **IPGWx** Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section.

Adding Linksets for Exception Routes

The linkset must be added according to the following rules:

- If the `dpc` value of the exception route entry is an **ANSI** point code, the adjacent point code of the new linkset must be an **ANSI** point code.
- If the exception route is an OPC-based exception route, the `opc` parameter value cannot be the adjacent point code of the linkset that is specified by the `lsn` parameter value.
- If the `dpc` value of the exception route entry is an **ITU**-I point code, the adjacent point code of the new linkset must be an **ITU**-I point code. If the linkset contains an **SAPC** (secondary adjacent point code), the adjacent point code of the new linkset can be either an **ITU**-N or **ITU**-N24 point code if the `sapc` value is an **ITU**-I point code. If the adjacent point code of the `nlsn` value is an **ITU**-N point code with a group code, when the exception route is changed, the group code of the adjacent point code of the new linkset does not have to be the same as the group code of the `opcn` value. If an **ITU**-N linkset is specified for the `ilsn` parameter, the group code of the adjacent point code of the `ilsn` value does not have to match the group code of the adjacent point code of the `nlsn` value.
- If the adjacent point code of the `nlsn` value is an **ITU**-N point code with a group code, when the exception route is changed, the group code of the adjacent point code of the new linkset does not have to be the same as the group code of the `opcn` value. If an **ITU**-N linkset is specified for the `ilsn` parameter, the group code of the adjacent point code of the `ilsn` value does not have to match the group code of the adjacent point code of the `nlsn` value.
- If the `dpc` value of the exception route entry is an **ITU**-N point code, the adjacent point code of the `nlsn` value must be an **ITU**-N point code.
  - If the `dpc` value of the exception route entry is an **ITU**-N point code with no group code assigned to the **ITU**-N point code, the adjacent point code of the `nlsn` value or the adjacent point code of all the linksets in the routeset can be an **ITU**-I point code if the `sapc` (secondary adjacent point code) value is an **ITU**-N point code.
  - If the `dpc` value of the exception route entry is an **ITU**-N point code with a group code, the adjacent point code of the `nlsn` value can be an **ITU**-I point code if the `sapc` value is an **ITU**-N point code. When the exception route is changed, the group code of the adjacent point code of the `nlsn` value and the `ilsn` value must be the same. The group code of the `dpcn` value must be the same as the group code of either the adjacent point code of the `nlsn` value or the `sapc` (secondary adjacent point code) assigned to the `nlsn` value.
- If the `dpc` value of the exception route entry is an **ITU**-N24 point code, the adjacent point code of the `lsn` value must be an **ITU**-N24 point code. If the linkset contains an **SAPC** (secondary adjacent point code), the adjacent point code of the `lsn` value can be an **ITU**-I point code if the `sapc` value is an **ITU**-N24 point code.

The **SAPC** values assigned to the linksets can be verified by entering the `rtrv-ls:lsn=<linkset name>` command.

1. Display the exception routes in the database by entering the `rtrv-rtx` command.

This is an example of the possible output.

```
rlghncxa03w 07-05-07 11:43:04 GMT  EAGLE5 37.0.0
   DPCA           RTX-CRITERIA              LSN         RC     APC

   003-003-003    OPCA
                  009-009-009               lsn1        3
002-002-002
                  010-010-010               lsn1        2
002-002-002
                  010-010-010               lsn2        10
002-002-003

                  ILSN
                  lsn3                      lsn2        2
002-002-003
                  lsn4                      lsn2        1
002-002-003
                  lsn4                      lsn1        10
002-002-002

                  CIC - ECIC
                  15    15                  lsn2        1
002-002-003
                  17    17                  lsn2        7
002-002-003
                  17    17                  lsn1        10
002-002-002
                  18    30                  lsn1        8
002-002-002
                  18    30                  lsn2        10
002-002-003

                  SI
                  3                         lsn2        5
002-002-003
                  3                         lsn1        10
002-002-002
                  5                         lsn2        5
002-002-003
   006-006-006    OPCA
                  125-150-175               lsn11       10
004-004-004

                  OPCI
                  2-103-1                   lsn11       20
004-004-004

                  ILSN
                  lsn12                     lsn11       11
004-004-004

                  lsn13                     lsn11       12
004-004-004
```

```
                 CIC - ECIC
                 250   250             lsn12      15    005-005-005
                 300   500             lsn12      25    005-005-005

                 SI
                 5                     lsn12      10    005-005-005

   DPCI          RTX-CRITERIA          LSN        RC    APC
   0-123-7       OPCI
                 1-222-3               lsn3       10    1-234-5
                 1-222-4               lsn3       11    1-234-5
                 1-222-5               lsn4       11    2-145-6

   3-025-6       OPCA
                 135-102-089           lsn13      10    1-100-5

                 OPCI
                 4-054-0               lsn13      15    1-100-5

                 OPCN
                 00503                 lsn11      15    1-100-5

                 ILSN
                 lsn2                  lsn14      45    4-139-4
                 lsn4                  lsn13      25    1-100-5
                 lsn16                 lsn16      50    12567

                 CIC - ECIC
                 100   100             lsn14      35    4-139-4
                 50    75              lsn13      40    1-100-5

                 SI
                 3                     lsn13      30    1-100-5

   DPCN          RTX-CRITERIA          LSN        RC    APC
   09852         OPCA
                 127-063-048           lsn15      10    11302

                 OPCI
                 3-037-1               lsn16      15    12567

                 OPCN
                 00409                 lsn13      20    1-100-5

                 ILSN
                 lsn13                 lsn15      25    11302
                 lsn4                  lsn16      30    12567

                 CIC - ECIC
                 1000  1000            lsn16      40    12567
                 2000  3000            lsn15      45    11302

                 SI
                 4                     lsn15      35    11302
```

```
DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              41
    TOTAL DPC(s):                  61
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:              12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

The DPC of an exception route entry can contain only a maximum of two entries with the same RC value and with either the same OPC value, the same ILSN value, the same single CIC value, the same range of CIC values, or the same SI value. The LSN value for each entry must be different. The DPC of an exception route entry can contain only one entry with a single CIC value. Continue the procedure by performing one of these steps.

- If no more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure with 3.
- If more than two entries in the exception route will contain the same exception route criteria, except for the linkset name, continue the procedure by performing one of these steps.
  - If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are shown in this step, continue the procedure with 3.
  - If more than two entries in an exception route that contain the same exception route criteria, except for the linkset name, are not shown in this step, continue the procedure with 2.

2. For an exception route to have more than two entries with the same exception route criteria, except for the linkset name (the `lsn` parameter value), the 6-Way Loadsharing on Routesets feature must be enabled and turned on.

   To verify the status of the 6-Way Loadsharing on Routesets feature, enter this command.

   `rtrv-ctrl-feat:partnum=893019801`

   The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:
```

```
Feature Name              Partnum
Zero entries found.
```

If the 6-Way Loadsharing on Routesets feature is not enabled or not turned on, perform Activating the 6-Way Loadsharing on Routesets Feature to enable and turn on the 6-Way Loadsharing on Routesets feature.

After the 6-Way Loadsharing on Routesets feature has been enabled and turned on, or if the `rtrv-ctrl-feat` output shows that the 6-Way Loadsharing on Routesets feature is enabled and turned on, continue this procedure by performing one of these steps.

- If only the relative cost of the exception route (`rc` parameter) is being changed, continue the procedure with 5.
- If the name of the linkset that will be specified for the `lsn` parameter is shown in the `rtrv-rtx` output, continue the procedure with 4. If the name of the linkset is not shown in the `rtrv-rtx` output, continue the procedure with 3

3. Display the linksets in the database by entering the `rtrv-ls` command.

   This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn1           002-002-002    none 1    1   no  B   2    off off off no
off
lsn2           002-002-003    none 1    1   no  B   3    off off off no
off
lsn11          004-004-004    none 1    1   no  B   1    off off off no
off
lsn12          005-005-005    none 1    1   no  B   4    off off off no
off

                                 L3T SLT              GWS GWS GWS

LSN            APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn3           1-234-5        none 1    2   no  B   2    off off off ---
off
lsn4           2-145-6        none 1    2   no  B   2    off off off ---
off
lsn13          1-100-5        none 1    2   no  B   1    off off off ---
off
lsn14          4-139-4        none 1    2   no  B   1    off off off ---
off

                                 L3T SLT              GWS GWS GWS

LSN            APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn5           00002          none 1    2   no  B   2    off off off ---
```

```
off
lsn6          00003         none 1   2   no  B   2    off off off
---   off
lsn15         11302         none 1   2   no  B   2    off off off
---   off
lsn16         12567         none 1   2   no  B   2    off off off
---   off

Link set table is (12 of 1024) 1% full.
```

If the required linkset is shown in the rtrv-ls output, continue the procedure with 4.

If the required linkset is not in the database, (see the "Adding Linksets for Exception Routes" section), perform one of these procedures to add the linkset.

a. Adding an SS7 Linkset
b. “Adding an X.25 Linkset” procedure in *Database Administration - Features User's Guide*
c. “Configuring an **IPGWx** Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section. After the new linkset has been added, continue the procedure with 5.

> **Note:**
>
> If the **DPC** exception route entry is an **ANSIDPC**, the adjacent point code of the `lsn` value must be an **ANSI** point code. If the **DPC** exception route entry is an **ANSIDPC**, continue the procedure with 5.

4. Display the linkset that will be assigned to the exception route entry by entering the `rtrv-ls` command with the name of the linkset.

   For this example, enter these commands.

   `rtrv-ls:lsn=lsn13`

   This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                    L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn13         1-100-5       none 1   2   no  B   1    off off off
---   off

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB
MULTGC
           -----------  1          no     ---  none     7      no

           ITUTFR RANDSLS
```

```
           off    all

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCN
          11211
Link set table is (12 of 1024) 1% full.
```

```
rtrv-ls:lsn=lsn16
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT  EAGLE5 36.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsn16         12567          none 1   2   no  B   2    off off off ---
off

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB MULTGC
           -----------  1          no     ---  none     7      no

           ITUTFR RANDSLS
           off    all

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

          LOC   LINK SLC TYPE     IPLIML2
          1301  A    0   IPLIMI   M2PA

          SAPCI
          5-067-1
Link set table is (12 of 1024) 1% full.
```

If the linkset does not meet the criteria shown in the "Adding Linksets for Exception Routes" section, either choose another linkset with an **ITU**-I, **ITU**-N, or **ITU**-N24 adjacent point code from the `rtrv-ls` output in 3 and repeat 4, or add a new linkset by performing one of these procedures:

a. Adding an SS7 Linkset
b. “Configuring an **IPGWx** Linkset,” "Adding an IPSG M2PA Linkset," or "Adding an IPSG M3UA Linkset" procedures in *Database Administration - IP7 User's Guide*.

The linkset must be added according to the rules shown in the "Adding Linksets for Exception Routes" section.

5. Change the exception route entry by entering the `chg-rtx` command and specifying the parameter combinations shown in Table 3-29 for the exception route criteria being assigned to the exception route.

Table 3-29 Change Exception Route Parameter Combinations

Exception Route Criteria				
:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route being changed (See Note 1)	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route being changed (See Note 1)	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route being changed (See Note 1)	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route being changed (See Note 1)	:dpc/dpca/ dpci/dpcn/ dpcn24 = **DPC** of the exception route being changed (See Note 1)
:opc/opca/ opci/opcn/ opcn24 = **OPC** value of the exception route being changed. (See Note 3)	:ilsn = incoming linkset name of the exception route being changed (See Note 3)	:si = service indicator value of the exception route being changed	:cic = circuit identification code value of the exception route being changed	:cic = the circuit identification code value beginning a range of **CICs** of the exception route being changed
:lsn = linkset name of the exception route being changed	:lsn = linkset name of the exception route being changed	:lsn = linkset name of the exception route being changed	:lsn = linkset name shown of the exception route being changed	:ecic = the circuit identification code value ending a range of **CICs** of the exception route being changed
:nlsn = new linkset name shown in the `rtrv-ls` output (See Notes 2, 3, 4, and 6)	:nlsn = new linkset name shown in the `rtrv-ls` output (See Notes 2, 3, 4, and 6)	:nlsn = new linkset name shown in the `rtrv-ls` output (See Notes 2, 4, and 6)	:nlsn = new linkset name shown in the `rtrv-ls` output (See Notes 2, 4, and 6)	:lsn = linkset name shown of the exception route being changed
:rc = new relative cost value, 0 - 99 (See Notes 4 and 5)	:rc = new relative cost value, 0 - 99 (See Notes 4 and 5)	:rc = new relative cost value, 0 - 99 (See Notes 4 and 5)	:rc = new relative cost value, 0 - 99 (See Notes 4 and 5)	:nlsn = new linkset name shown in the `rtrv-ls` output (See Notes 2, 4, and 6)
:force=yes (See Note 3)	:force=yes (See Note 3)			:rc = new relative cost value, 0 - 99 (See Notes 4 and 5)

Table 3-29 (Cont.) Change Exception Route Parameter Combinations

Exception Route Criteria
Notes: 1. The **DPC** of an exception route entry can contain only a maximum of two entries with the same **RC** value and with either the same **OPC** value, the same **ILSN** value, the same **SI** value, the same **CIC** value, or range of **CIC** values if the 6-Way Loadsharing on Routesets feature is not enabled or turned on. If the 6-Way Loadsharing on Routesets feature is enabled and turned on, the **DPC** of an exception route entry can contain more than two entries with the same **RC** value and with either the same **OPC** value, the same **ILSN** value, the same **SI** value, the same **CIC** value, or range of **CIC** values, the **LSN** value for each entry must be different. 2. The new linkset specified in this step must meet the criteria shown in the "Adding Linksets for Exception Routes" section. 3. The `force=yes` parameter must be used if the **LSN** and **ILSN** values are the same, or if the OPC value is the same as the APC of the linkset specified by the `lsn` parameter. 4. The `nlsn` or `rc` parameters, or both parameters, must be specified with the `chg-rtx` command. 5. The new `rc` parameter value must be different from the current `rc` parameter value. 6. The `nlsn` parameter value cannot be currently assigned to the DPC of the exception route that is being changed.

For this example, enter these commands.

```
chg-
rtx:dpca=003-003-003:opca=009-009-009:lsn=lsn1:nlsn=lsn2 :rc=20
```

```
chg-rtx:dpci=0-123-7:ilsn=lsn4:lsn=13:nlsn=lsn16
```

```
chg-rtx:dpci=0-123-7:cic=50:ecic=75:lsn=lsn13:rc=20
```

```
chg-rtx:dpcn=09852:cic=1000:lsn=lsn16:rc=45
```

```
chg-rtx:dpcn=09852:si=4:lsn=lsn15:nlsn=lsn16:rc=50
```

```
chg-rtx:dpcn=09852:ilsn=lsn13:nlsn=lsn13:force=yes
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0
CHG-RTX: MASP A - COMPLTD
```

> **Note:**
>
> If the linkset name was changed in 5, the `lsn` value for the `rtrv-rtx` command must be the `nlsn` value specified in 5.

6. Verify the changes using the `rtrv-rtx` command, specifying these parameters depending on the exception route criteria specified in 5.
   a. If the `opc/opca/opci/opcn/opcn24` parameter was specified in 5 - enter these parameters and values specified in 5 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `opc/opca/opci/opcn/opcn24`, and `lsn`.

b. If the `ilsn` parameter was specified in 5 - enter these parameters and values specified in 5 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `ilsn`, and `lsn`.

c. If the `si` parameter was specified in 5 - enter these parameters and values specified in 5 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `si`, and `lsn`.

d. If only the `cic` parameter was specified in 5 - enter these parameters and values specified in 5 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `cic`, and `lsn`.

e. If the `cic` and `ecic` parameters were specified in 5 - enter these parameters and values specified in 5 with the `rtrv-rtx` command – `dpc/dpca/dpci/dpcn/dpcn24`, `cic`, `ecic`, and `lsn`.

For this example, enter these commands.

```
rtrv-rtx:dpca=003-003-003:opca=009-009-009:lsn=lsn2


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCA           RTX-CRITERIA              LSN         RC     APC

   003-003-003    OPCA
                  009-009-009               lsn2        20
002-002-003

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpci=3-025-6:ilsn=lsn4:lsn=lsn16


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCI           RTX-CRITERIA              LSN         RC     APC

   3-025-6        ILSN
                  lsn4                      lsn16       25     12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
```

```
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpci=3-025-6:cic=50:ecic=75:lsn=lsn13


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCI          RTX-CRITERIA              LSN        RC    APC

   3-025-6       CIC - ECIC
                 50    75                  lsn13      20    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpcn=09852:ilsn=lsn13:lsn=13


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCN          RTX-CRITERIA              LSN        RC    APC

   09852         ILSN
                 lsn13                     lsn13      25    1-100-5

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%

rtrv-rtx:dpcn=09852:si=4:lsn=lsn16


rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCN          RTX-CRITERIA              LSN        RC    APC

   09852         SI
                 4                         lsn16      50    12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
```

```
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

```
rtrv-rtx:dpcn=09852:cic=1000:lsn=lsn16
```

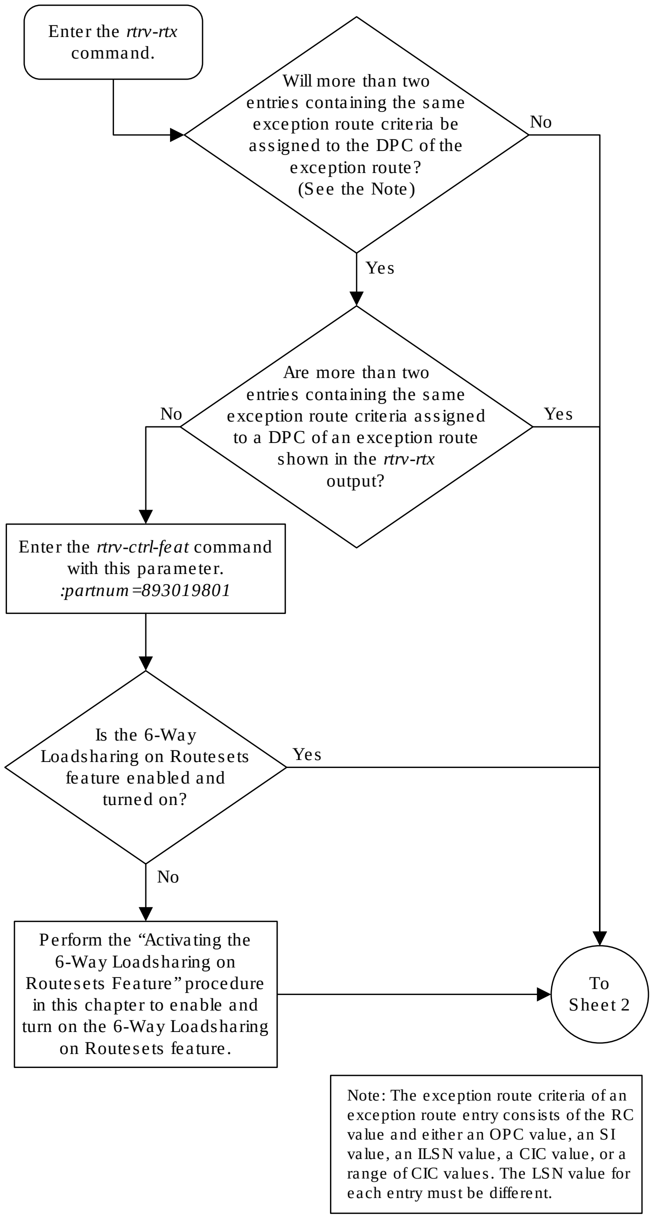
```
rlghncxa03w 06-10-07 08:28:30 GMT  EAGLE5 36.0.0

   DPCN          RTX-CRITERIA              LSN        RC     APC
   09852         CIC - ECIC
                 1000                      lsn16      45     12567

DESTINATION ENTRIES ALLOCATED:   2000
    FULL DPC(s):                   20
    EXCEPTION DPC(s):              36
    TOTAL DPC(s):                  56
    CAPACITY (% FULL):              3%
ALIASES ALLOCATED:               12000
    ALIASES USED:                   0
    CAPACITY (% FULL):              0%
```

7. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

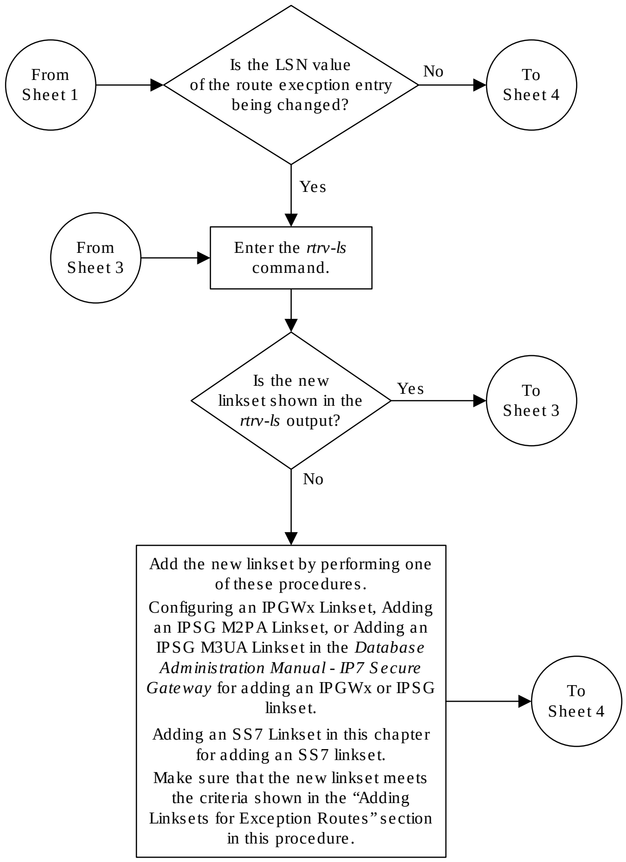
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

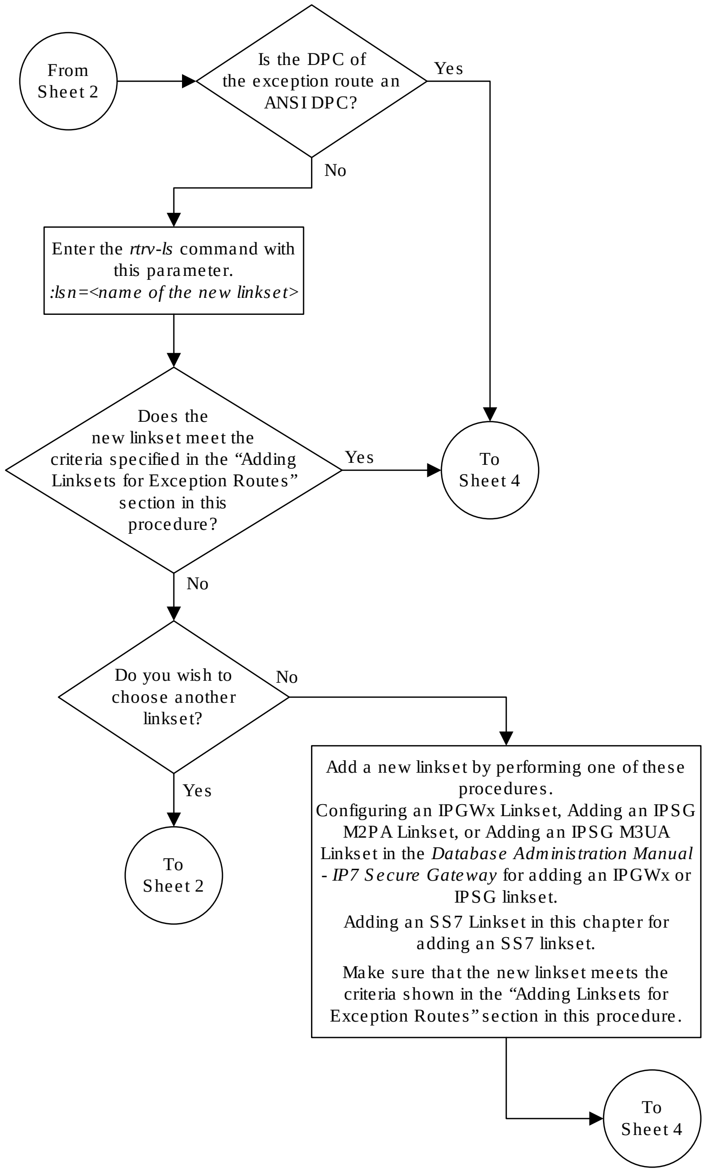
Figure 3-47   Changing a Route Exception Entry



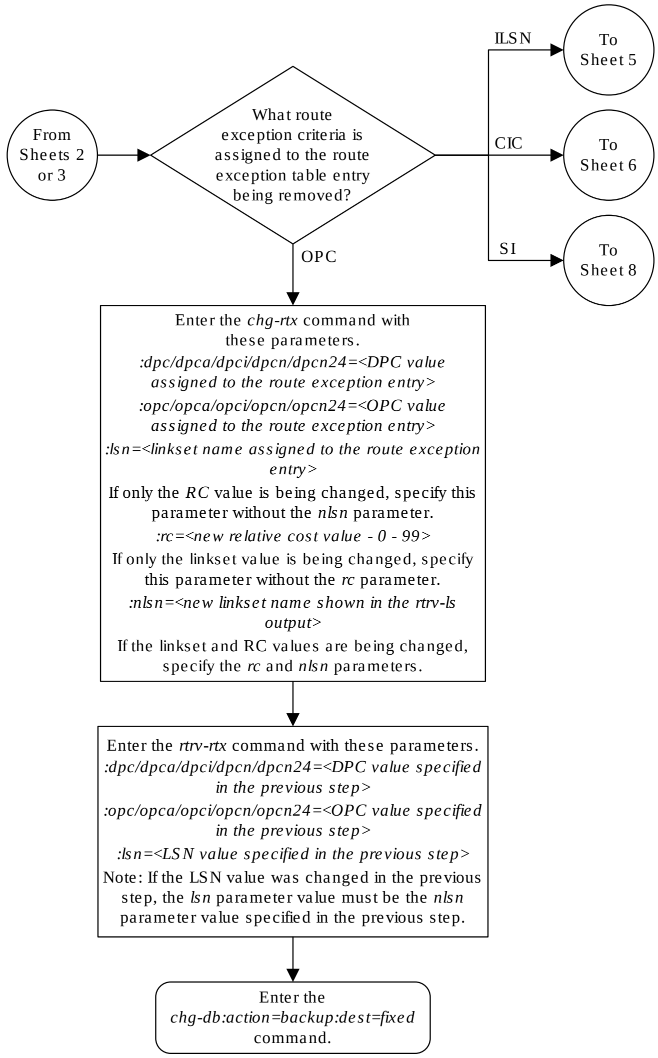
Sheet 1 of 8


From Sheet 1
Is the LSN value of the route execption entry being changed?
No
To Sheet 4
Yes
From Sheet 3
Enter the *rtrv-ls* command.
Is the new linkset shown in the *rtrv-ls* output?
Yes
To Sheet 3
No
Add the new linkset by performing one of these procedures.
Configuring an IPGWx Linkset, Adding an IPSG M2PA Linkset, or Adding an IPSG M3UA Linkset in the *Database Administration Manual - IP7 Secure Gateway* for adding an IPGWx or IPSG linkset.
Adding an SS7 Linkset in this chapter for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the "Adding Linksets for Exception Routes" section in this procedure.
To Sheet 4

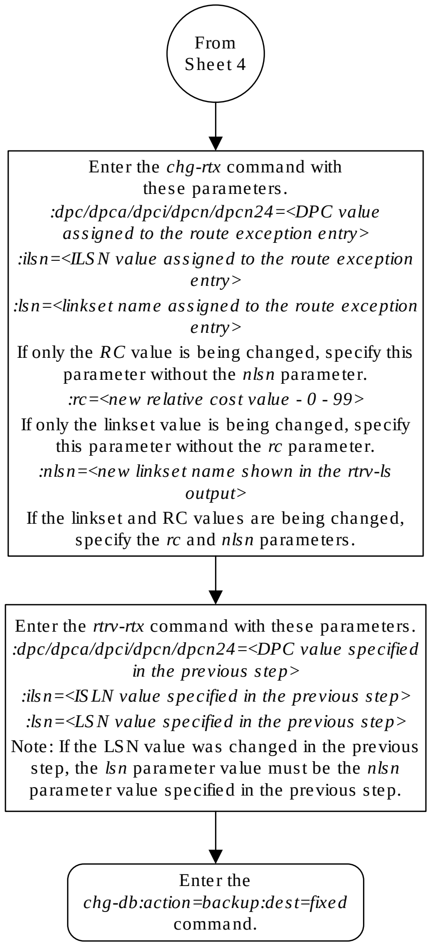
Sheet 2 of 8


From Sheet 2
Is the DPC of the exception route an ANSI DPC?
Yes
No
Enter the *rtrv-ls* command with this parameter.
:lsn=<name of the new linkset>
Does the new linkset meet the criteria specified in the “Adding Linksets for Exception Routes” section in this procedure?
Yes
To Sheet 4
No
Do you wish to choose another linkset?
No
Yes
To Sheet 2
Add a new linkset by performing one of these procedures.
Configuring an IPGWx Linkset, Adding an IPSG M2PA Linkset, or Adding an IPSG M3UA Linkset in the *Database Administration Manual - IP7 Secure Gateway* for adding an IPGWx or IPSG linkset.
Adding an SS7 Linkset in this chapter for adding an SS7 linkset.
Make sure that the new linkset meets the criteria shown in the “Adding Linksets for Exception Routes” section in this procedure.
To Sheet 4

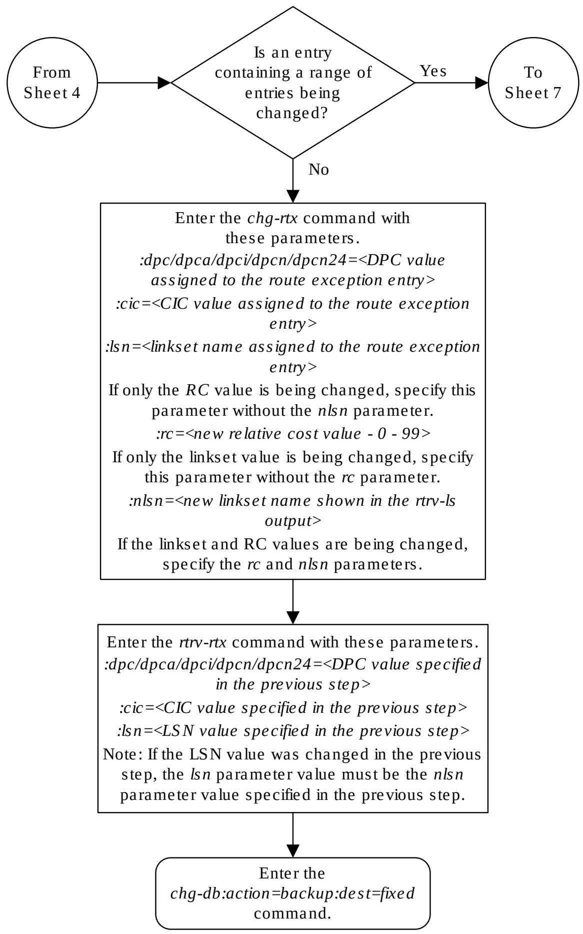
Sheet 3 of 8


From Sheets 2 or 3
What route exception criteria is assigned to the route exception table entry being removed?
ILSN
To Sheet 5
CIC
To Sheet 6
SI
To Sheet 8
OPC
Enter the chg-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:opc/opca/opci/opcn/opcn24=<OPC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
If only the RC value is being changed, specify this parameter without the nlsn parameter.
:rc=<new relative cost value - 0 - 99>
If only the linkset value is being changed, specify this parameter without the rc parameter.
:nlsn=<new linkset name shown in the rtrv-ls output>
If the linkset and RC values are being changed, specify the rc and nlsn parameters.
Enter the rtrv-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:opc/opca/opci/opcn/opcn24=<OPC value specified in the previous step>
:lsn=<LSN value specified in the previous step>
Note: If the LSN value was changed in the previous step, the lsn parameter value must be the nlsn parameter value specified in the previous step.
Enter the chg-db:action=backup:dest=fixed command.

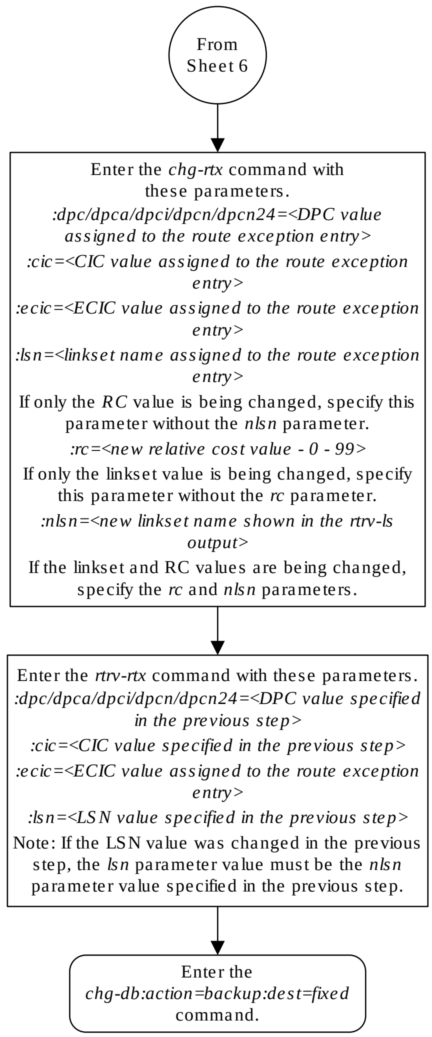
Sheet 4 of 8


From Sheet 4
Enter the chg-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:ilsn=<ILSN value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
If only the RC value is being changed, specify this parameter without the nlsn parameter.
:rc=<new relative cost value - 0 - 99>
If only the linkset value is being changed, specify this parameter without the rc parameter.
:nlsn=<new linkset name shown in the rtrv-ls output>
If the linkset and RC values are being changed, specify the rc and nlsn parameters.
Enter the rtrv-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:ilsn=<ISLN value specified in the previous step>
:lsn=<LSN value specified in the previous step>
Note: If the LSN value was changed in the previous step, the lsn parameter value must be the nlsn parameter value specified in the previous step.
Enter the chg-db:action=backup:dest=fixed command.

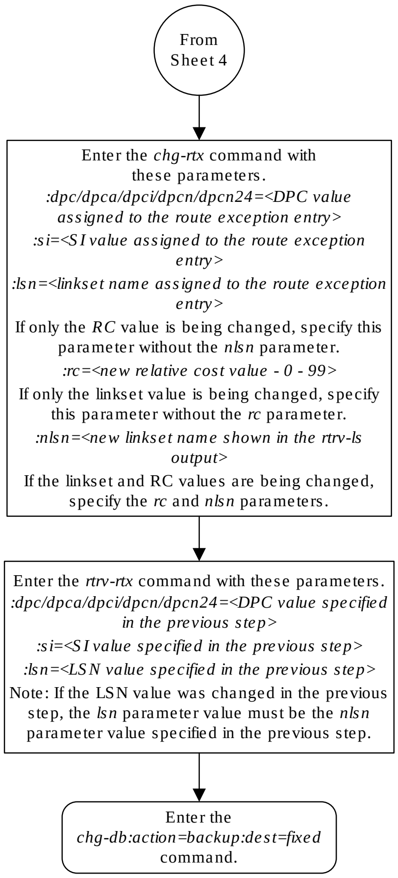
Sheet 5 of 8


From Sheet 4
Is an entry containing a range of entries being changed?
Yes
To Sheet 7
No
Enter the chg-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
If only the RC value is being changed, specify this parameter without the nlsn parameter.
:rc=<new relative cost value - 0 - 99>
If only the linkset value is being changed, specify this parameter without the rc parameter.
:nlsn=<new linkset name shown in the rtrv-ls output>
If the linkset and RC values are being changed, specify the rc and nlsn parameters.
Enter the rtrv-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value specified in the previous step>
:lsn=<LSN value specified in the previous step>
Note: If the LSN value was changed in the previous step, the lsn parameter value must be the nlsn parameter value specified in the previous step.
Enter the chg-db:action=backup:dest=fixed command.

Sheet 6 of 8


From Sheet 6
Enter the chg-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value assigned to the route exception entry>
:cic=<CIC value assigned to the route exception entry>
:ecic=<ECIC value assigned to the route exception entry>
:lsn=<linkset name assigned to the route exception entry>
If only the RC value is being changed, specify this parameter without the nlsn parameter.
:rc=<new relative cost value - 0 - 99>
If only the linkset value is being changed, specify this parameter without the rc parameter.
:nlsn=<new linkset name shown in the rtrv-ls output>
If the linkset and RC values are being changed, specify the rc and nlsn parameters.
Enter the rtrv-rtx command with these parameters.
:dpc/dpca/dpci/dpcn/dpcn24=<DPC value specified in the previous step>
:cic=<CIC value specified in the previous step>
:ecic=<ECIC value assigned to the route exception entry>
:lsn=<LSN value specified in the previous step>
Note: If the LSN value was changed in the previous step, the lsn parameter value must be the nlsn parameter value specified in the previous step.
Enter the chg-db:action=backup:dest=fixed command.

Sheet 7 of 8



Sheet 8 of 8

3.44 Activating the Circular Route Auto-Recovery Feature

This procedure is used to enable and turn on the Circular Route Auto-Recovery feature using the feature's part number and a feature access key.

The feature access key for the Circular Route Auto-Recovery feature is based on the features part number and the serial number of the EAGLE, making the feature access key site-specific.

The `enable-ctrl-feat` command enables the feature by inputting the features access key and the features part number with these parameters:

`:fak` – The feature access key provided by Oracle.

`:partnum` – The Oracle-issued part number of the Circular Route Auto-Recovery feature, 893017601.

Once this feature is enabled, it is permanently enabled. This feature cannot be enabled with a temporary feature access key.

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Circular Route Auto-Recovery feature, 893017601.

`:status=on` – used to turn the Circular Route Auto-Recovery feature on.

The status of the Circular Route Auto-Recovery feature is shown with the `rtrv-ctrl-feat` command.

Once the Circular Route Auto-Recovery feature has been turned on, it can be turned off. For more information on turning off the Circular Route Auto-Recovery feature, go to the Turning Off the Circular Route Auto-Recovery Feature procedure.

Once the Circular Route Auto-Recovery feature has been turned on, it automatically clears CRD when Far End Loopback is detected.

1. Display the controlled features in the database by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

   ```
   rlghncxa03w 07-03-28 11:43:04 GMT EAGLE5 35.6.0
   The following features have been permanently enabled:
   ```

```
Feature Name              Partnum    Status  Quantity
SCCP Conversion           893012001  on      ----
EIR                       893012301  on      ----
GSM Map Screening (GMS)   893013201  on      ----
HC-MIM SLK Capacity       893012707  on      64


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period
Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the Circular Route Auto-Recovery feature is enabled, the entry `Circ Route Auto-Recovery` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the Circular Route Auto-Recovery feature is on, no further action can be performed.

If the Circular Route Auto-Recovery feature is enabled but not turned on, skips steps 2 through 6 and go to step 7.

If the Circular Route Auto-Recovery feature is not enabled, go to step 2.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in step 1 shows any controlled features, skip steps 2 through 5, and go to step 6. If the `rtrv-ctrl-feat` output shows only HC-MIM SLK Capacity feature with a quantity of 64, steps 2 through 5 must be performed.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-10-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, skip steps 4, 5, and 6, and go to step 7. If the serial number is correct but not locked, skip steps 4 and 5, and go to step 6. If the serial number is not correct, but is locked, the Circular Route Auto-Recovery feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

4. Verify that the serial number entered into step 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231

   System serial number is not locked.

   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   Command Completed
   ```

   If the serial number was not entered correctly, repeat steps 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in step 2, if the serial number shown in step 2 is correct, or with the serial number shown in step 4, if the serial number was changed in step 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

6. Enable the Circular Route Auto-Recovery feature by entering the `enable-ctrl-feat` command. For this example, enter this command.

   `enable-ctrl-feat:partnum=893017603:fak= <Circular Route Auto-Recovery feature access key>`

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the Circular Route Auto-Recovery feature, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

7. Turn the Circular Route Auto-Recovery feature on by entering the `chg-ctrl-feat` command with the part number used in step 6 and the `status=on` parameter.

   For this example, enter this command.

   `chg-ctrl-feat:partnum=893017601:status=on`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-03-28 21:15:37 GMT EAGLE5 35.6.0
   CHG-CTRL-FEAT: MASP A - COMPLTD
   ```

8. Verify the changes by entering this command.

   `rtrv-ctrl-feat:partnum=893017601`

   The following is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Circ Route Auto-Recovery  893017601  on      ----

   The following features have been temporarily enabled:

   Feature Name              Partnum    Status  Quantity     Trial
   Period Left
   Zero entries found.

   The following features have expired temporary keys:
   ```

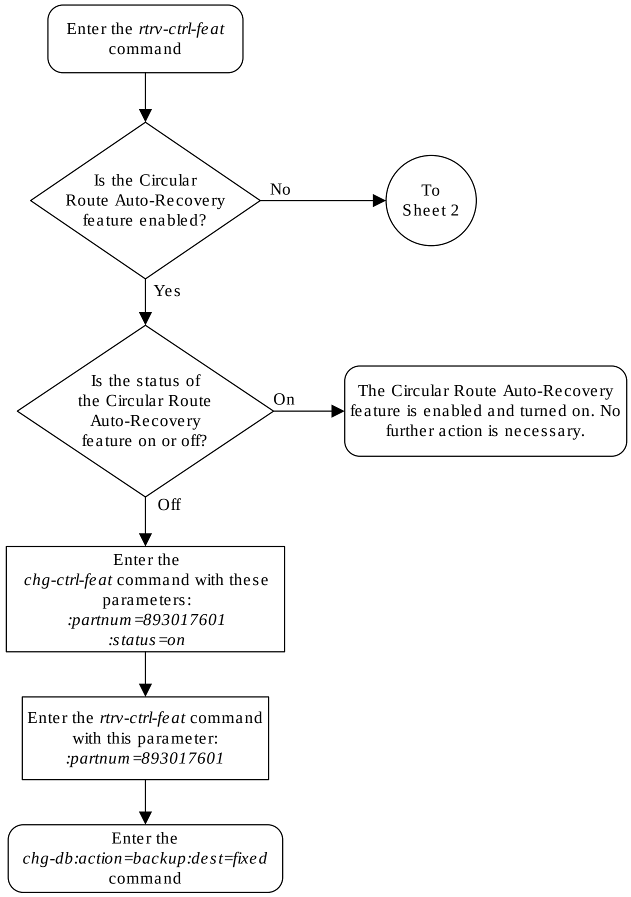
```
Feature Name              Partnum
Zero entries found.
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

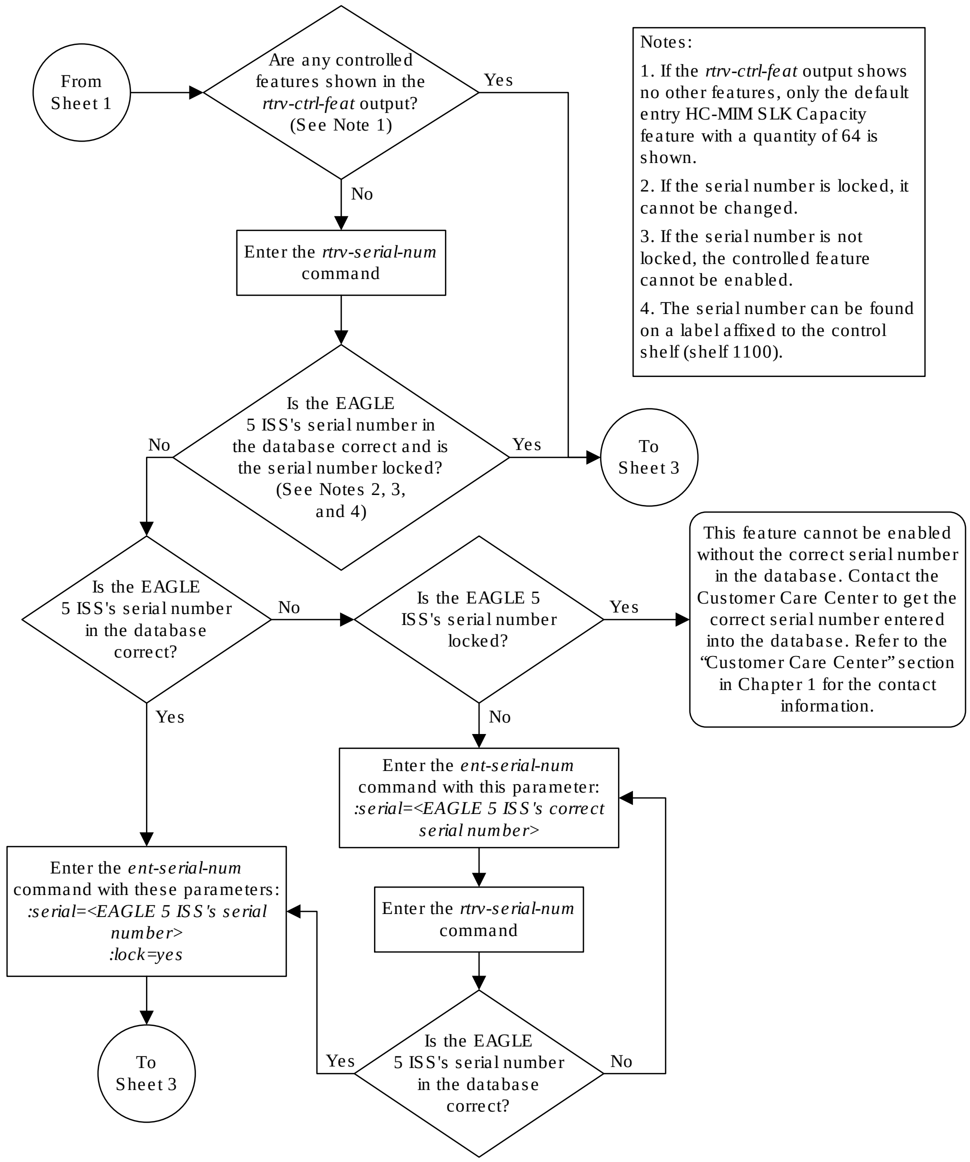
   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

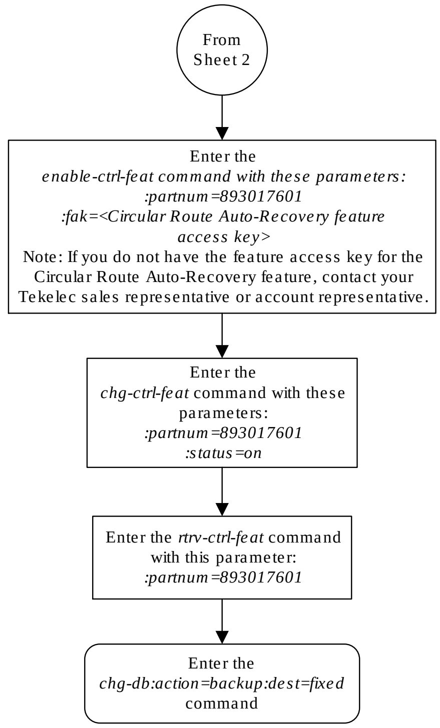
Figure 3-48 Activating the Circular Route Auto-Recovery Feature



Sheet 1 of 3


From Sheet 1
Are any controlled features shown in the *rtrv-ctrl-feat* output? (See Note 1)
Yes
No
Enter the *rtrv-serial-num* command
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
No
Yes
To Sheet 3
Notes:
1. If the *rtrv-ctrl-feat* output shows no other features, only the default entry HC-MIM SLK Capacity feature with a quantity of 64 is shown.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).
Is the EAGLE 5 ISS's serial number in the database correct?
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Yes
No
Enter the *ent-serial-num* command with this parameter: *:serial=<EAGLE 5 ISS's correct serial number>*
Enter the *ent-serial-num* command with these parameters: *:serial=<EAGLE 5 ISS's serial number>* *:lock=yes*
Enter the *rtrv-serial-num* command
To Sheet 3
Yes
Is the EAGLE 5 ISS's serial number in the database correct?
No

Sheet 2 of 3



Sheet 3 of 3

3.45 Turning Off the Circular Route Auto-Recovery Feature

This procedure is used to turn off the Circular Route Auto-Recovery feature using the chg-ctrl-feat command.

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Circular Route Auto-Recovery feature, 893017601.

`:status=off` – used to turn off the Circular Route Auto-Recovery feature.

The status of the Circular Route Auto-Recovery feature must be `on` and is shown with the `rtrv-ctrl-feat` command.

> **Caution:**
>
> Circular Route Auto-Recovery will not be performed if the Circular Route Auto-Recovery feature is turned off.

1. Display the status of the Circular Route Auto-Recovery feature by entering the `rtrv-ctrl-feat:partnum=893017601` command. The following is an example of the possible output.

   ```
   rlghncxa03w 07-03-28 11:43:04 GMT EAGLE5 35.6.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Circ Route Auto-Recovery  893017601  on      ----

   The following features have been temporarily enabled:

   Feature Name              Partnum   Status Quantity   Trial Period Left
   Zero entries found.

   The following features have expired temporary keys:

   Feature Name              Partnum
   Zero entries found.
   ```

   If the status of the Circular Route Auto-Recovery feature is off, or if the Circular Route Auto-Recovery feature is not enabled, this procedure cannot be performed.

2. Turn off the Circular Route Auto-Recovery feature by entering the `chg-ctrl-feat` command with the `status=off` parameter.

   For this example, enter this command.

   `chg-ctrl-feat:partnum=893017601:status=off`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-03-28 21:15:37 GMT EAGLE5 35.6.0
   CHG-CTRL-FEAT: MASP A - COMPLTD
   ```

3. Verify that the Circular Route Auto-Recovery feature has been turned off by using the `rtrv-ctrl-feat:partnum=893017601` command. The following is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   ```

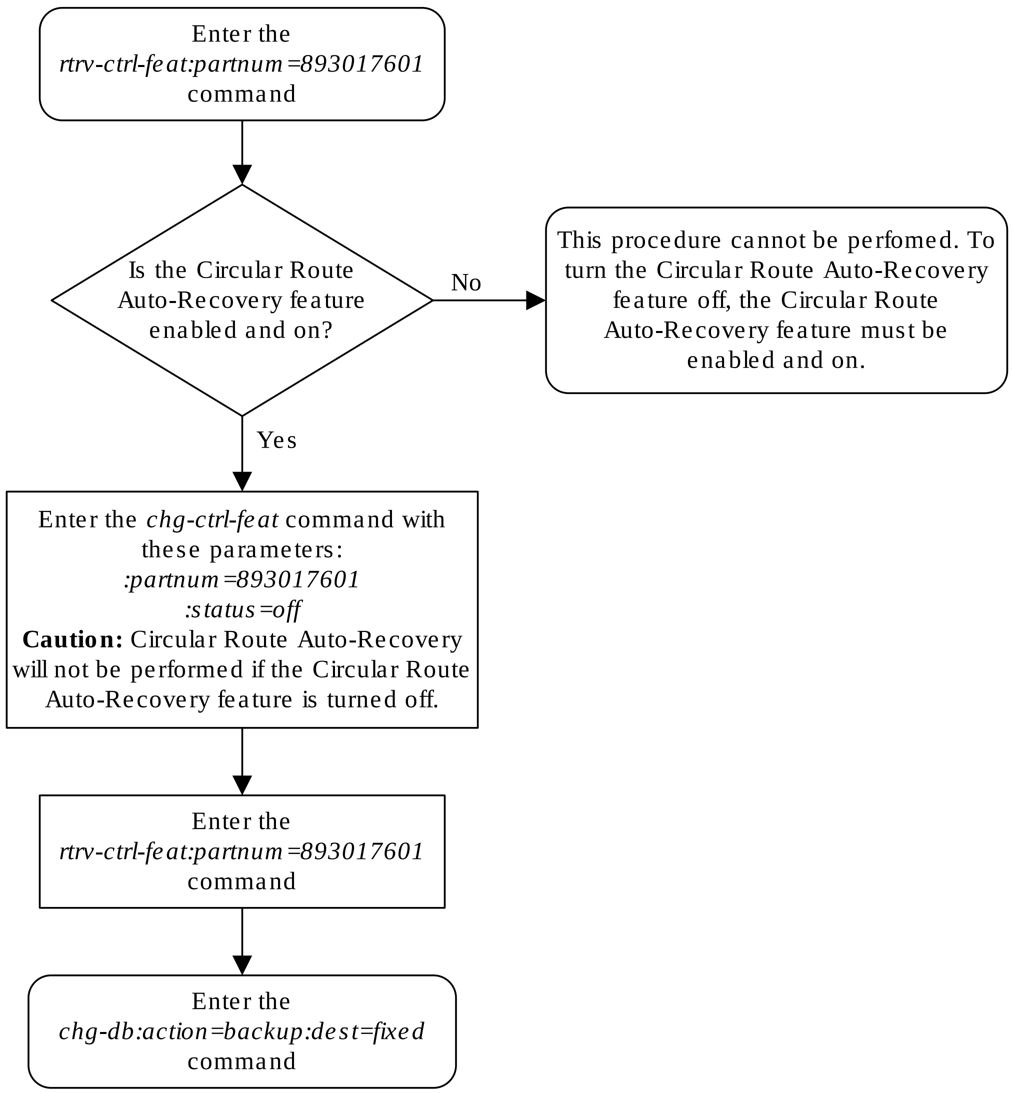
```
Circ Route Auto-Recovery  893017601  off     ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

4. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-49 Turning Off the Circular Route Auto-Recovery Feature



3.46 Activating the Enhanced Far-End Loopback Detection Feature

This procedure is used to enable and turn on the Enhanced Far-End Loopback Detection feature using the feature's part number and a feature access key.

The feature access key for the Enhanced Far-End Loopback Detection feature is based on the features part number and the serial number of the EAGLE, making the feature access key site-specific.

The `enable-ctrl-feat` command enables the feature by inputting the features access key and the features part number with these parameters:

`:fak` – The feature access key provided by Oracle.

`:partnum` – The Oracle-issued part number of the Enhanced Far-End Loopback Detection feature, 893017601.

Once this feature is enabled, it is permanently enabled. This feature cannot be enabled with a temporary feature access key.

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**’s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Circular Route Auto-Recovery feature, 893018101.

`:status=on` – used to turn the Enhanced Far-End Loopback Detection feature on.

The status of the Enhanced Far-End Loopback Detection feature is shown with the `rtrv-ctrl-feat` command.

Once the Enhanced Far-End Loopback Detection feature has been turned on, it can be turned off. For more information on turning off the Enhanced Far-End Loopback Detection feature, go to the Turning Off the Enhanced Far-End Loopback Detection Feature procedure.

Once the Enhanced Far-End Loopback Detection feature has been turned on, it significantly decreases the time required to take a link out of service. Whenever a trigger event occurs that indicates that Far-End Loopback may have occurred, the EAGLE will send an SLTM within 250 milliseconds after the trigger event has occurred. Normal processing of this SLTM will take the link out of service if the same SLTM is received at the OPC. The Enhanced Far-End Loopback feature will fail the link as quickly as possible. This rapid failure will prevent the EAGLE from marking DPCs as CRD-prohibited.

1. Display the controlled features in the database by entering the `rtrv-ctrl-feat` command. This is an example of the possible output.

```
rlghncxa03w 07-03-28 11:43:04 GMT EAGLE5 35.6.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
SCCP Conversion           893012001  on      ----
EIR                       893012301  on      ----
GSM Map Screening (GMS)   893013201  on      ----
HC-MIM SLK Capacity       893012707  on      64


The following features have been temporarily enabled:

Feature Name              Partnum   Status Quantity   Trial Period Left
Zero entries found.


The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If the Enhanced Far-End Loopback Detection feature is enabled, the entry `Enhanced Far-End Loopback` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the Enhanced Far-End Loopback Detection feature is on, no further action can be performed.

If the Enhanced Far-End Loopback Detection feature is enabled but not turned on, skips steps 2 through 6 and go to step 7.

If the Enhanced Far-End Loopback Detection feature is not enabled, go to step 2.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in step 1 shows any controlled features, skip steps 2 through 5, and go to step 6. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, steps 2 through 5 must be performed.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-10-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, skip steps 4, 5, and 6, and go to step 7. If the serial number is correct but not locked, skip steps 4 and 5, and go to step 6. If the serial number is not correct, but is locked, the Circular Route Auto-Recovery feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to #unique_102 for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered into step 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231
```

```
System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

If the serial number was not entered correctly, repeat steps 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in step 2, if the serial number shown in step 2 is correct, or with the serial number shown in step 4, if the serial number was changed in step 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Enable the Enhanced Far-End Loopback Detection feature by entering the `enable-ctrl-feat` command. For this example, enter this command.

   `enable-ctrl-feat:partnum=893018103:fak= <Enhanced Far-End Loopback Detection feature access key>`

> **Note:**
>
> The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the Enhanced Far-End Loopback Detection feature, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

7. Turn the Enhanced Far-End Loopback Detection feature on by entering the `chg-ctrl-feat` command with the part number used in step 6 and the `status=on` parameter.

   For this example, enter this command.

   `chg-ctrl-feat:partnum=893018101:status=on`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-03-28 21:15:37 GMT EAGLE5 35.6.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

8. Verify the changes by entering this command.

   `rtrv-ctrl-feat:partnum=893018101`

   The following is an example of the possible output.

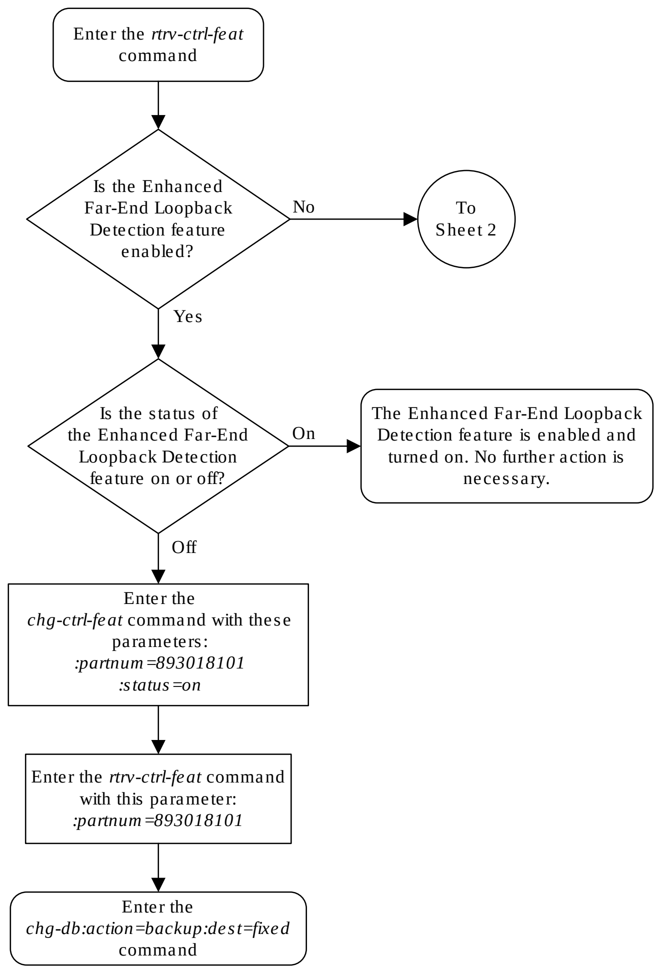
```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Enhanced Far-End Loopback 893018101  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

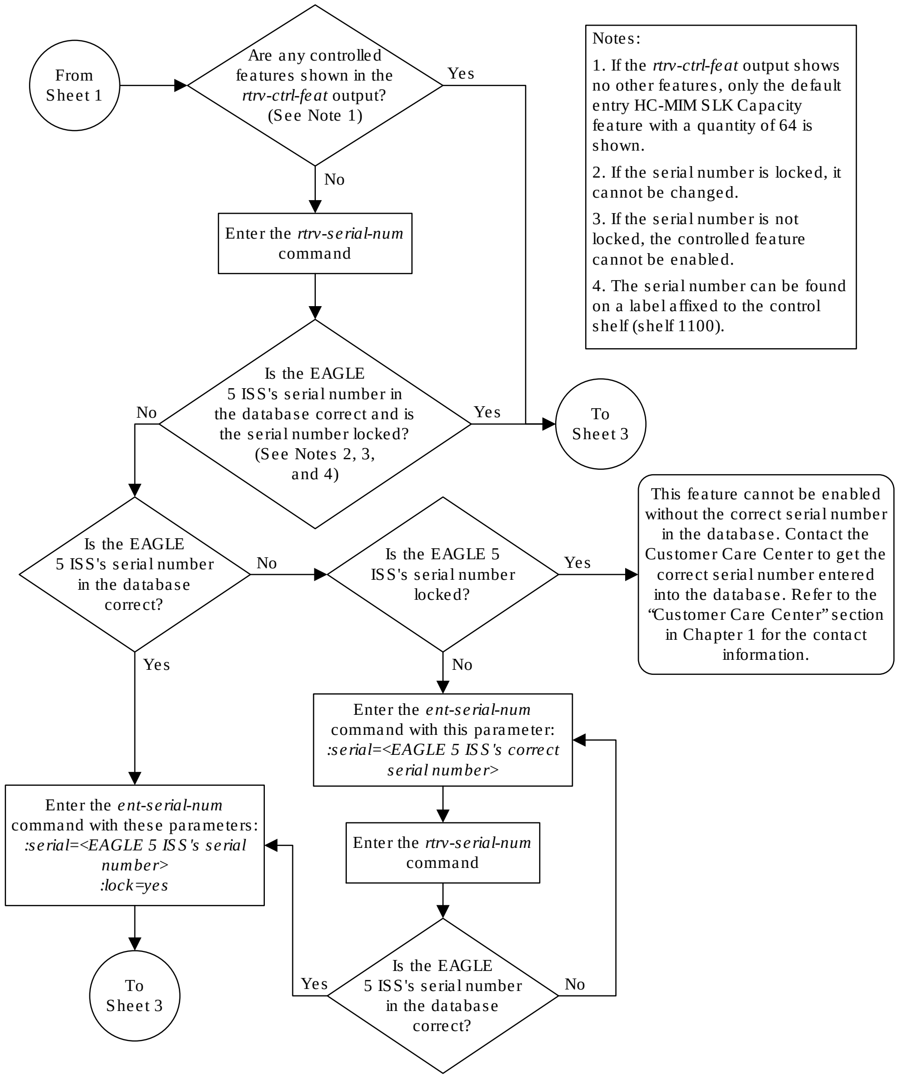
   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

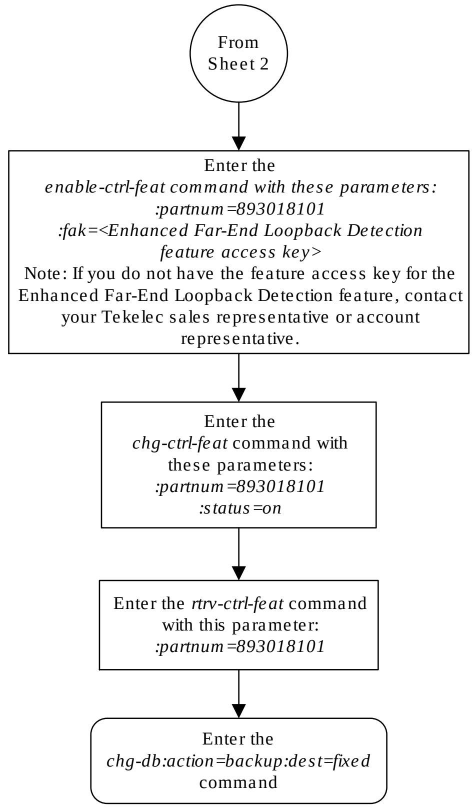
Figure 3-50   Activating the Enhanced Far-End Loopback Detection Feature



Sheet 1 of 3


From Sheet 1
Are any controlled features shown in the rtrv-ctrl-feat output? (See Note 1)
Yes
No
Enter the rtrv-serial-num command
Notes:
1. If the rtrv-ctrl-feat output shows no other features, only the default entry HC-MIM SLK Capacity feature with a quantity of 64 is shown.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
No
Yes
To Sheet 3
Is the EAGLE 5 ISS's serial number in the database correct?
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Yes
No
Enter the ent-serial-num command with this parameter: :serial=<EAGLE 5 ISS's correct serial number>
Enter the ent-serial-num command with these parameters: :serial=<EAGLE 5 ISS's serial number> :lock=yes
Enter the rtrv-serial-num command
To Sheet 3
Yes
Is the EAGLE 5 ISS's serial number in the database correct?
No

Sheet 2 of 3



Sheet 3 of 3

3.47 Turning Off the Enhanced Far-End Loopback Detection Feature

This procedure is used to turn off the Enhanced Far-End Loopback Detection feature using the chg-ctrl-feat command.

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Enhanced Far-End Loopback Detection feature, 893018101.

`:status=off` – used to turn off the Enhanced Far-End Loopback Detection feature.

The status of the Enhanced Far-End Loopback Detection feature must be `on` and is shown with the `rtrv-ctrl-feat` command.

> **Caution:**
>
> Enhanced Far-End Loopback Detection will not be performed if the Enhanced Far-End Loopback Detection feature is turned off.

1. Display the status of the Enhanced Far-End Loopback Detection feature by entering the `rtrv-ctrl-feat:partnum=893018101` command. The following is an example of the possible output.

   ```
   rlghncxa03w 07-03-28 11:43:04 GMT EAGLE5 35.6.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Enhanced Far-End Loopback 893018101  on      ----

   The following features have been temporarily enabled:

   Feature Name              Partnum   Status Quantity   Trial Period
   Left
   Zero entries found.

   The following features have expired temporary keys:

   Feature Name              Partnum
   Zero entries found.
   ```

   If the status of the Enhanced Far-End Loopback Detection feature is off, or if the Enhanced Far-End Loopback Detection feature is not enabled, this procedure cannot be performed.

2. Turn off the Enhanced Far-End Loopback Detection feature by entering the `chg-ctrl-feat` command with the `status=off` parameter.

   For this example, enter this command.

   `chg-ctrl-feat:partnum=893018101:status=off`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-03-28 21:15:37 GMT EAGLE5 35.6.0
   CHG-CTRL-FEAT: MASP A - COMPLTD
   ```

3. Verify that the Enhanced Far-End Loopback Detection feature has been turned off by using the `rtrv-ctrl-feat:partnum=893018101` command. The following is an example of the possible output.

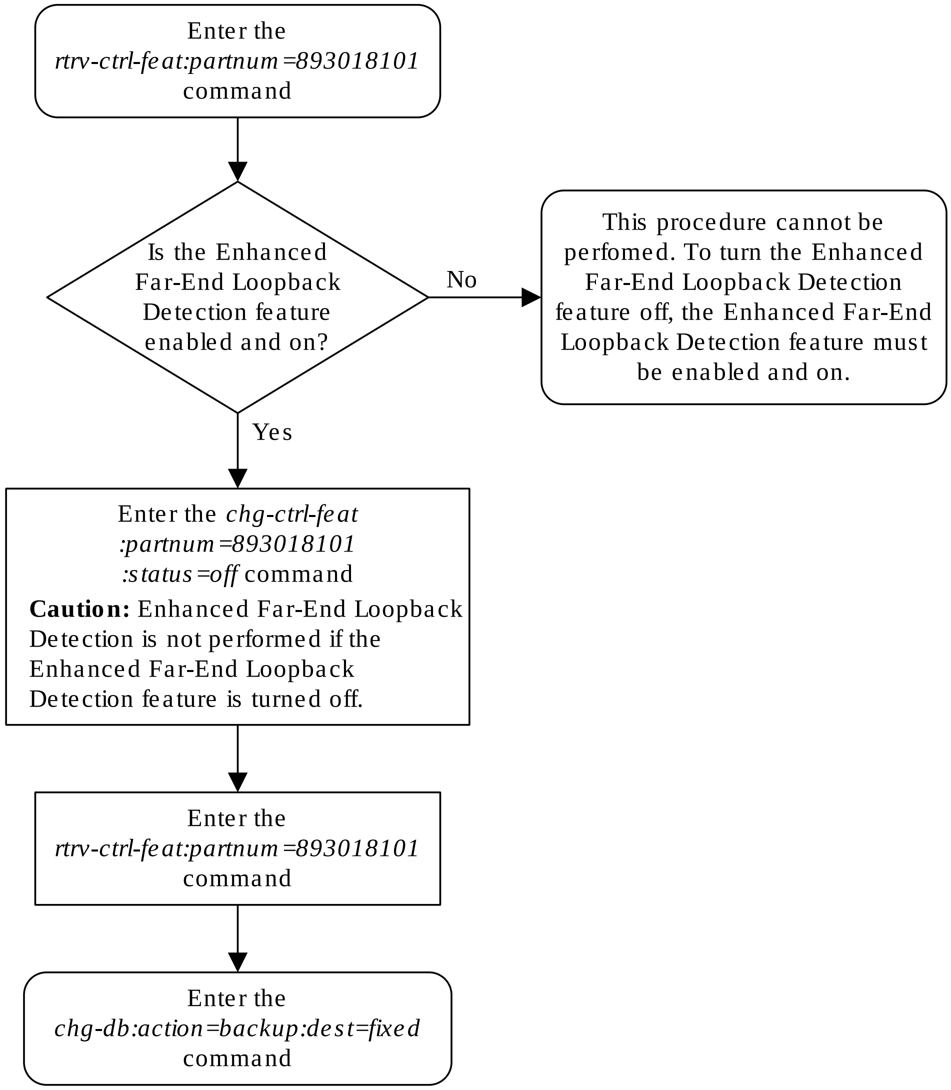
```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Enhanced Far-End Loopback 893018101  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

4. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-51 Turning Off the Enhanced Far-End Loopback Detection Feature



3.48 Activating the Multiple Linksets to Single Adjacent PC (MLS) Feature

This procedure is used to enable and turn on the Multiple Linksets to Single Adjacent PC (MLS) feature with the `enable-ctrl-feat` and `chg-ctrl-feat` commands.

The `enable-ctrl-feat` command enables the Multiple Linksets to Single Adjacent PC (MLS) feature by specifying the part number and feature access key for this feature with these parameters:

`:fak` – The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive. If you do not have the feature access key for the proxy point code quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

`:partnum` – The Oracle-issued part number for the Multiple Linksets to Single Adjacent PC (MLS), 893019701.

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

To enable the Multiple Linksets to Single Adjacent PC (MLS) feature, the Multiple Point Code feature must be turned on using the `chg-feat` command. The `rtrv-feat` command shows whether or not the Multiple Point Code feature is turned on.

> **Note:**
>
> Once the Multiple Point Code feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Multiple Point Code feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Multiple Point Code feature, contact your Oracle Sales Representative or Account Representative.

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the Multiple Linksets to Single Adjacent PC (MLS) feature, 893019701.

`:status=on` – used to turn the Multiple Linksets to Single Adjacent PC (MLS) feature on.

The status of this feature in the **EAGLE** is shown with the `rtrv-ctrl-feat` command.

After this feature is enabled and turned on, an adjacent point code can be assigned to a maximum of six linksets.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If the Multiple Linksets to Single Adjacent PC (MLS) feature is enabled and turned on, the entry `MLS` is shown in the permanently enabled section of the `rtrv-`

`ctrl-feat` output. If the status of the Origin-Based MTP Routing feature is on, no further action can be performed.

If the Multiple Linksets to Single Adjacent PC (MLS) feature is enabled but not turned on, continue the procedure with 9.

If the Multiple Linksets to Single Adjacent PC (MLS) feature is not enabled, continue the procedure with 2.

2. Enter the `rtrv-feat` command and verify that the Multiple Point Code feature is turned on.

   If the Multiple Point Code feature is on, the `MPC = on` entry appears in the output.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Multiple Point Code feature is not on, continue the procedure with 3.

   If the Multiple Point Code feature is on, continue the procedure with 4.

   If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with Oracle. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 4 through 7 must be performed.

3. Turn the Multiple Point Code feature on by entering this command.

   `chg-feat:mpc=on`

   > **Note:**
   >
   > Once the Multiple Point Code feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The Multiple Point Code feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Multiple Point Code feature, contact your Oracle Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 07-05-28 11:43:04 GMT EAGLE5 37.0.0
CHG-FEAT: MASP A - COMPLTD
```

   Continue the procedure with 4.

   If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with Oracle. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 4 through 7 must be performed.

4. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231

   System serial number is not locked, yet.
   ```

   > **Note:**
   >
   > If the serial number is correct and locked, continue the procedure with Oracle. If the serial number is correct but not locked, continue the procedure with 7. If the serial number is not correct, but is locked, the Multiple Linksets to Single Adjacent PC (MLS) feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

5. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

6. Verify that the serial number entered into 5 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231

   System serial number is not locked, yet.
   ```

   If the serial number was not entered correctly, repeat 5 and 6 and re-enter the correct serial number.

7. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 4 , if the serial number shown in 4 is correct, or with the serial number shown in 6 , if the serial number was changed in 5 , and with the `lock=yes` parameter.

For this example, enter this command.

```
ent-serial-num:serial=<EAGLE's serial number>:lock=yes
```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

8. Enable the Multiple Linksets to Single Adjacent PC (MLS) feature with the `enable-ctrl-feat` command specifying the part number for the Multiple Linksets to Single Adjacent PC (MLS) feature and the feature access key.

   For this example, enter this command.

   ```
   enable-ctrl-feat:partnum=893019701:fak=<Multiple Linksets to
   Single Adjacent PC (MLS) feature access key>
   ```

   > **Note:**
   >
   > A temporary feature access key cannot be specified to enable the Multiple Linksets to Single Adjacent PC (MLS) feature.

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the Multipl Linksets to Single Adjacent PC (MLS) feature you wish to enable, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

9. Turn the Multiple Linksets to Single Adjacent PC (MLS) feature on by entering the `chg-ctrl-feat` command with the part number used in Oracle and the `status=on` parameter.

   > **Caution:**
   >
   > Once the Multiple Linksets to Single Adjacent PC (MLS) feature is turned on, it cannot be turned off.

   For this example, enter this command.

   ```
   chg-ctrl-feat:partnum=893019701:status=on
   ```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

10. Verify the changes by entering the `rtrv-ctrl-feat`command with the routeset quantity part number specified in 9 .

    For this example, enter this command.

    `rtrv-ctrl-feat:partnum=893019701`

    The following is an example of the possible output.

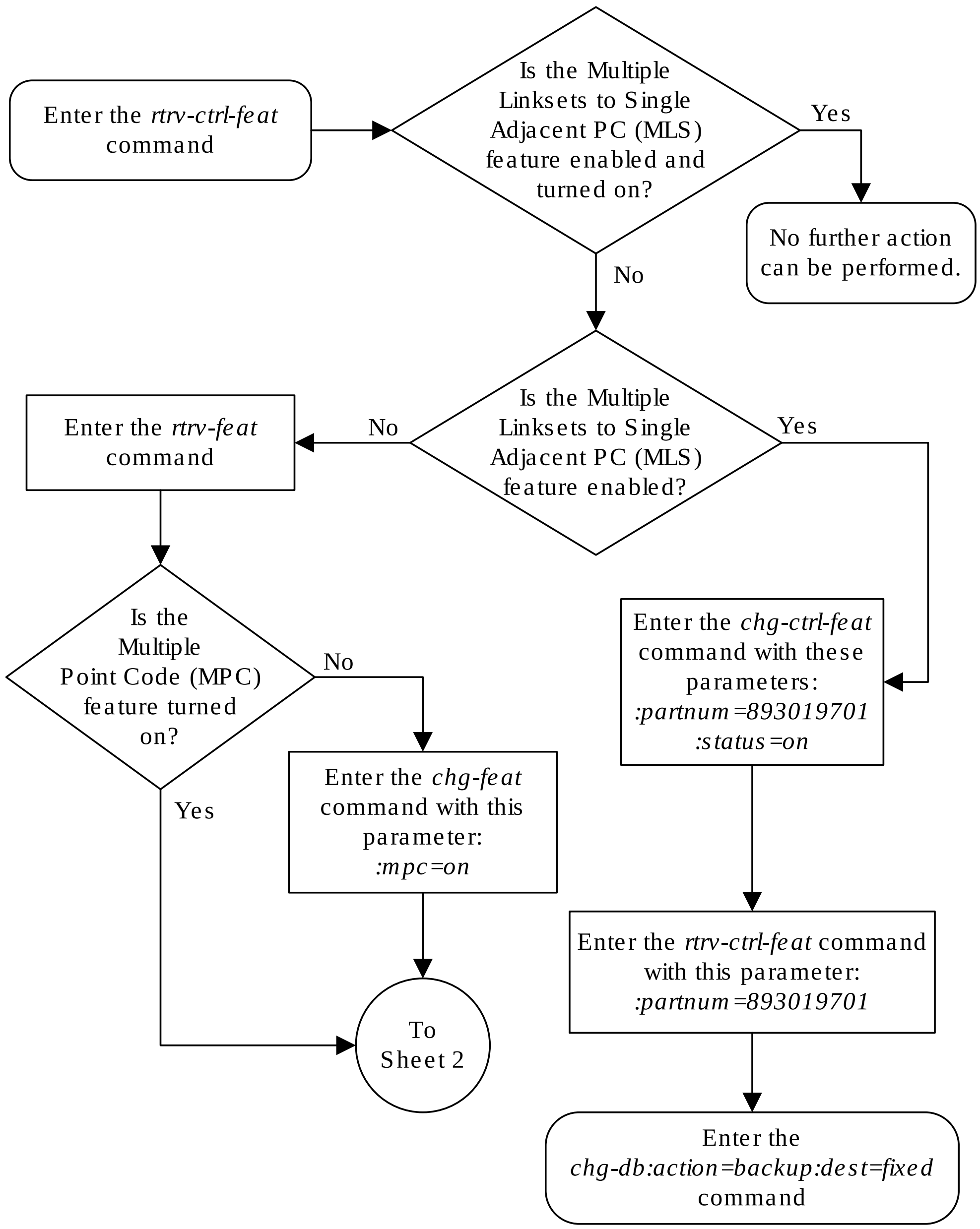
```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Multiple Linkset to APC   893019701  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

11. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

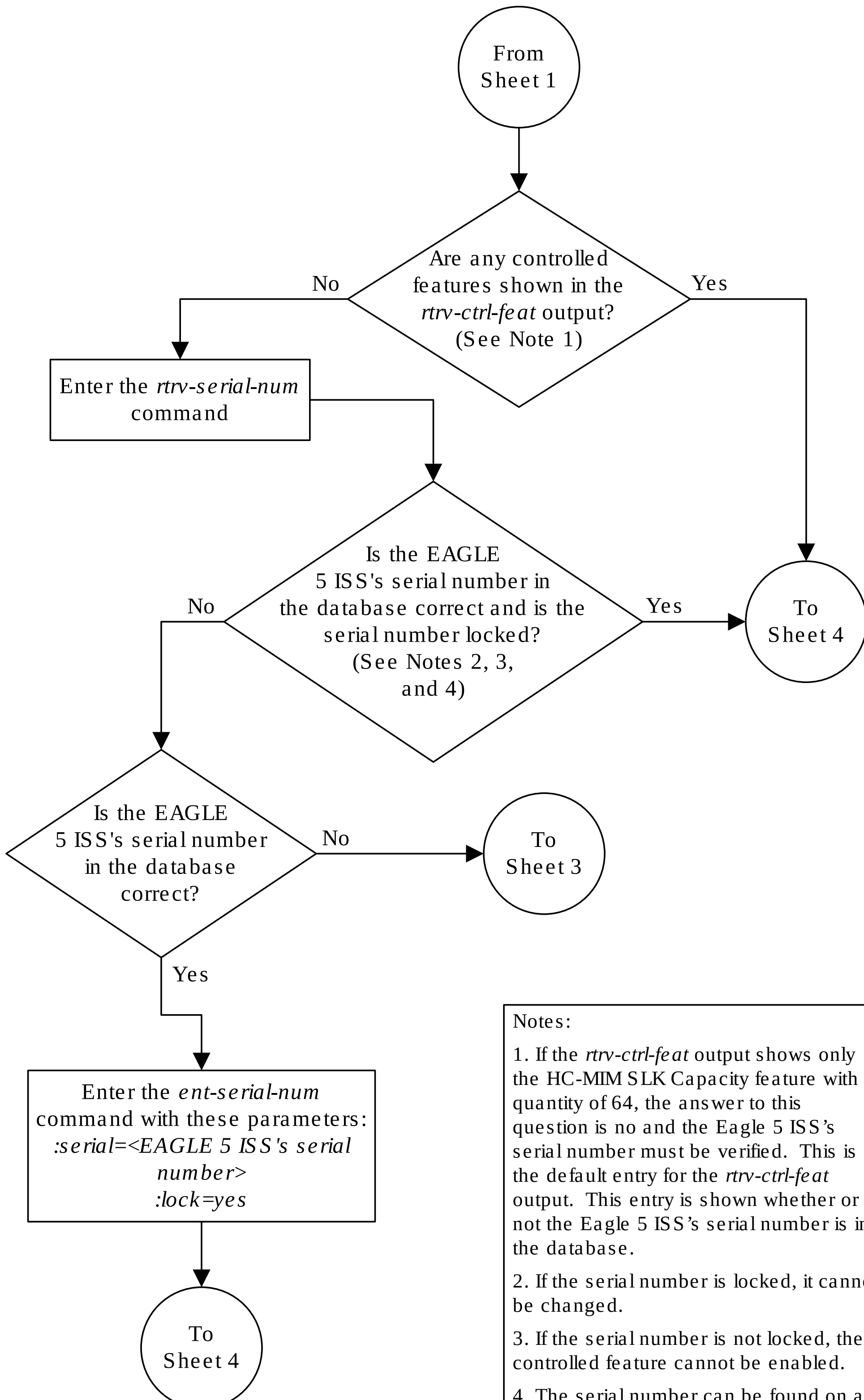
    These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-52 Activating the Multiple Linksets to Single Adjacent PC (MLS) Feature



Sheet 1 of 4



Notes:

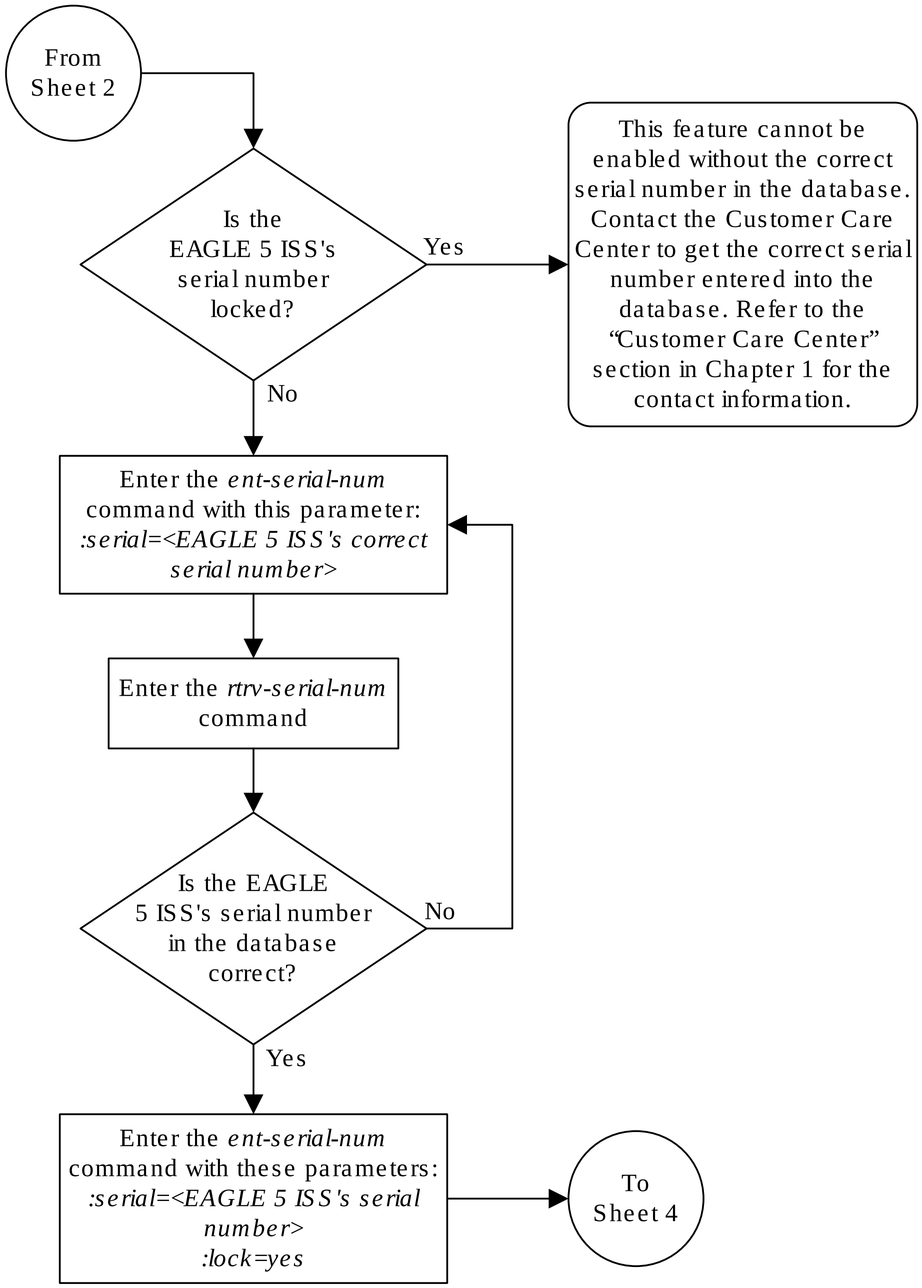
1. If the *rtrv-ctrl-feat* output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the answer to this question is no and the Eagle 5 ISS's serial number must be verified. This is the default entry for the *rtrv-ctrl-feat* output. This entry is shown whether or not the Eagle 5 ISS's serial number is in the database.

2. If the serial number is locked, it cannot be changed.

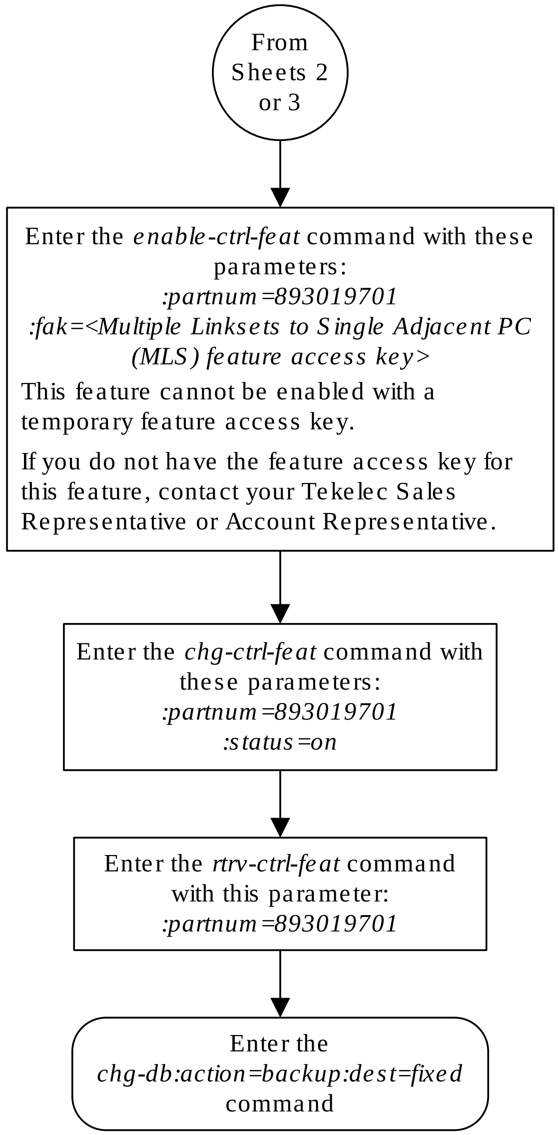
3. If the serial number is not locked, the controlled feature cannot be enabled.

4. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Sheet 2 of 4


From Sheet 2
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the ent-serial-num command with this parameter: :serial=<EAGLE 5 ISS's correct serial number>
Enter the rtrv-serial-num command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the ent-serial-num command with these parameters: :serial=<EAGLE 5 ISS's serial number> :lock=yes
To Sheet 4

Sheet 3 of 4


From Sheets 2 or 3
Enter the enable-ctrl-feat command with these parameters:
:partnum=893019701
:fak=<Multiple Linksets to Single Adjacent PC (MLS) feature access key>
This feature cannot be enabled with a temporary feature access key.
If you do not have the feature access key for this feature, contact your Tekelec Sales Representative or Account Representative.
Enter the chg-ctrl-feat command with these parameters:
:partnum=893019701
:status=on
Enter the rtrv-ctrl-feat command with this parameter:
:partnum=893019701
Enter the chg-db:action=backup:dest=fixed command

Sheet 4 of 4

3.49 Configuring the ITU Linkset NI Mapping Options

This procedure is used to configure the network indicator (NI) mapping options for an ITU-I or ITU-N linkset. These options are configured with the `chg-lsopts` command and these parameters.

`:lsn` - The name of the ITU-I or ITU-N linkset.

`:icnimap` - This parameter specifies the type of network indicator (**NI**) mapping for incoming MSUs on the linkset. The NI value in the incoming MSU is changed to the value specified by the `icnimap` parameter before processing the message. The values for this parameter are: `itui2ituis`, `ituis2itui`, `itun2ituns`, `ituns2itun`, or `none`.

- `itui2ituis` - Map the ITU international network indicator value to the ITU international spare network indicator value
- `ituis2itui` - Map the ITU international spare network indicator value to the ITU international network indicator value
- `itun2ituns` - Map the ITU national network indicator value to the ITU national spare network indicator value
- `ituns2itun` - Map the ITU national spare network indicator value to the ITU national network indicator value
- `none` - network indicator mapping is not performed on the specified linkset.

The value of the `icnimap` parameter for the linkset is not changed if the `icnimap` parameter is not specified with the `chg-lsopts` command. The system default value for the `icnimap` parameter is `none`.

`:ognimap` - This parameter specifies the type of network indicator (**NI**) mapping for outgoing MSUs on the linkset. The NI value in the processed MSU is changed to the value specified by the `ognimap` parameter for that linkset before routing the message to its intended destination. The values for this parameter are: `itui2ituis`, `ituis2itui`, `itun2ituns`, `ituns2itun`, or `none`.

- `itui2ituis` - Map the ITU international network indicator value to the ITU international spare network indicator value
- `ituis2itui` - Map the ITU international spare network indicator value to the ITU international network indicator value
- `itun2ituns` - Map the ITU national network indicator value to the ITU national spare network indicator value
- `ituns2itun` - Map the ITU national spare network indicator value to the ITU national network indicator value
- `none` - network indicator mapping is not performed on the specified linkset.

The value of the `ognimap` parameter for the linkset is not changed if the `ognimap` parameter is not specified with the `chg-lsopts` command. The system default value for the `ognimap` parameter is `none`.

To specify the `icnimap` and `ognimap` parameters, the ITU National and International Spare Point Code Support feature must be enabled. Refer to the Activating the ITU National and International Spare Point Code Support Feature procedure for information about enabling the ITU National and International Spare Point Code Support feature. Values for the `icnimap` and `ognimap` parameters other than `none` can be specified only for linksets that have ITU-I or 14-bit ITU-N adjacent point codes. If either the `icnimap` or `ognimap` parameters are specified for the `chg-lsopts` command, both parameters must be specified for the `chg-lsopts` command. The network indicator mapping value for incoming messages on the linkset must be compatible with the network indicator mapping value for the outgoing messages on the linkset. For example, if the `icnimap=itui2ituis` parameter is specified for the linkset, the `ognimap=ituis2itui` parameter must be specified for the linkset. Table 3-30 shows the relationship between the `icnimap` and `ognimap` parameter values.

Table 3-30 Network Indicator Mapping Rules

ICNIMAP Parameter Value	OGNIMAP Parameter Value
ITUI2ITUIS	ITUIS2ITUI
ITUIS2ITUI	ITUI2ITUIS
ITUN2ITUNS	ITUNS2ITUN
ITUNS2ITUN	ITUN2ITUNS
NONE	NONE

The values of the `icnimap` and `ognimap` parameters are shown in the `ICNIMAP` and `OGNIMAP` columns of the `rtrv-ls` output. The `ICNIMAP` and `OGNIMAP` columns are shown only if the linkset name (`lsn` parameter) is specified with the `rtrv-ls` command, the ITU National and International Spare Point Code Support feature is enabled, and if the adjacent point code of the linkset is either an ITU-I or ITU-N point code.

1. Display the linksets that are provisioned in the database by entering the `rtrv-ls` command.

   The following is an example of the possible output.

```
rlghncxa03w 08-08-10 11:43:04 GMT EAGLE5 39.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2          001-207-000    none 1   1   no  B   6    off off off no
off
e1m1s1        001-001-001    none 1   1   no  A   7    off off off no
off
e1m1s2        001-001-002    none 1   1   no  A   7    off off off no
off
ls04          001-002-003    scr2 1   1   no  a   4    off off off yes
off
ls1305        000-005-000    none 1   1   no  A   1    off off off no
off
ls1307        000-007-000    none 1   1   no  A   1    off off off no
off

                                 L3T SLT              GWS GWS GWS
```

```
LSN             APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
e1e2i           1-207-0       none 1   1   no  B   4    off off off
---   on
ls1315          0-015-0       none 1   1   no  A   1    off off off
---   off
ls1317          0-017-0       none 1   1   no  A   1    off off off
---   on
e1m2s1          1-011-1       none 1   1   no  A   7    off off off
---   off
e1m2s2          1-011-2       none 1   1   no  A   7    off off off
---   off

                                   L3T SLT              GWS GWS GWS
LSN             APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5            11520         scr3 1   1   no  a   3    on  off off
---   on
lsn6            11211         scr3 1   1   no  a   3    on  off off
---   on

Link set table is (10 of 1024) 1% full.
```

This procedure can be performed only on ITU-I or ITU-N linksets. An ITU-I linkset is a linkset whose adjacent point code is shown in the `APCI` column of the `rtrv-ls` output. An ITU-N linkset is a linkset whose adjacent point code is shown in the `APCN` column of the `rtrv-ls` output. If no ITU-I or ITU-N linksets are shown in this step, this procedure cannot be performed.

If ITU-I or ITU-N linksets are shown in this step, continue the procedure with 2.

2. Display one of the ITU-I or ITU-N linksets shown in 1 by entering the `rtrv-ls` command with the name of one of the ITU-I or ITU-N linksets shown in 1. For this example, enter this command.

   `rtrv-ls:lsn=lsn5`

   The following is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                   L3T SLT              GWS GWS GWS
LSN             APCN   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5            11211         scr3 1   1   no  a   3    on  off off
---   on

           CLLI         TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB
ITUTFR
           lsn5clli     1          no     ---  none      1      off

           RANDSLS  ICNIMAP     OGNIMAP
           off      none        none

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
```

```
 no      ---------- ---   ---      ---       CdPA

                           L2T             PCR   PCR
LOC    LINK SLC TYPE       SET  BPS    ECM   N1    N2
2105   b    0   LIMDS0     1    56000  BASIC ---   -----
2113   b    1   LIMDS0     1    56000  BASIC ---   -----
2111   a    2   LIMDS0     1    56000  BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

The ITU NI mapping options are shown in the `ICNIMAP` and `OGNIMAP` columns in the `rtrv-ls` output. The ITU National and International Spare Point Support feature must be enabled for these columns to appear in the `rtrv-ls` output.

- If the `ICNIMAP` and `OGNIMAP` columns are shown in the `rtrv-ls` output, continue the procedure with 3.
- If the `ICNIMAP` and `OGNIMAP` columns are not shown in the `rtrv-ls` output, the ITU National and International Spare Point Code Support feature must be enabled. Perform the Activating the ITU National and International Spare Point Code Support Feature procedure to enable the ITU National and International Spare Point Code Support feature. After the ITU National and International Spare Point Code Support feature has been enabled, continue the procedure with 3.

3. Configure the ITU network indicator mapping options for the linkset displayed in 2 by entering the `chg-lsopts` command.

   For this example, enter this command.

   `chg-lsopts:lsn=lsn5:icnimap=itun2ituns:ognimap=ituns2itun`

   > **Note:**
   >
   > The network indicator mapping value for incoming messages on the linkset must be compatible with the network indicator mapping value for the outgoing messages on the linkset. For example, if the `icnimap=itui2ituis` parameter is specified for the linkset, the `ognimap=ituis2itui` parameter must be specified for the linkset. Table 3-30 shows the relationship between the `icnimap` and `ognimap` parameter values. The `icnimap` and `ognimap` parameter values entered in this step must be entered according to the relationships shown in Table 3-30.

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 08-08-28 21:18:37 GMT EAGLE5 39.0.0
Link set table is (13 of 1024) 1% full.
CHG-LSOPTS: MASP A - COMPLTD
```

4. Verify the changes by entering the `rtrv-ls` command with the name of the linkset specified in 3. For this example, enter this command.

   `rtrv-ls:lsn=lsn5`

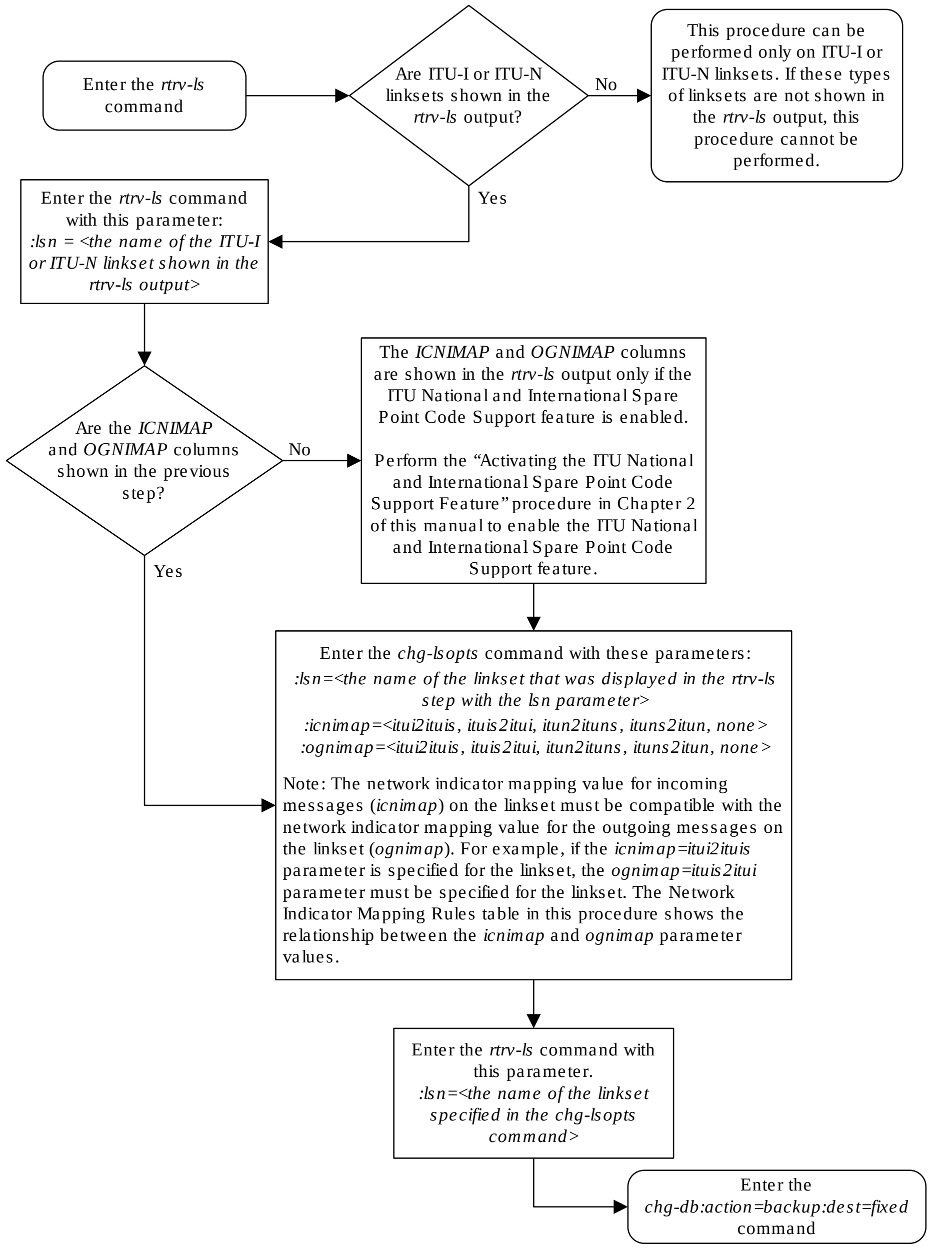
The following is an example of the possible output.

```
rlghncxa03w 09-07-17 11:43:04 GMT EAGLE5 41.1.0

                                 L3T SLT             GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsn5          11211          scr3 1   1   no  a   3    on  off off
---   on

           CLLI        TFATCABMLQ MTPRSE ASL8 SLSOCBIT SLSRSB
ITUTFR
           lsn5clli    1          no     ---  none     1      off

           RANDSLS  ICNIMAP    OGNIMAP
           off      itun2ituns ituns2itun

           IPGWAPC MATELSN    IPTPS LSUSEALM SLKUSEALM GTTMODE
           no      ---------- ---   ---      ---       CdPA

                                  L2T              PCR  PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1   N2
          2105  b    0   LIMDS0   1    56000  BASIC ---  -----
          2113  b    1   LIMDS0   1    56000  BASIC ---  -----
          2111  a    2   LIMDS0   1    56000  BASIC ---  -----

Link set table is ( 24 of 1024)  2% full
```

5. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-53 Configuring the ITU Linkset NI Mapping Options



3.50 Configuring the Option for Handling Message Priorities for Messages Crossing into ITU-I and ITU-N Networks

This procedure is used to configure the option for handling the priority value of messages that cross into ITU-I and ITU-N networks using the `chg-ss7opts` command with these two parameters.

`:msgpri2itui` – This parameter specifies the priority value for messages that cross into an ITU-I network. The values for this parameter are:

- `dflt` - The priority value for an MTP-routed message is set to 0. A message routed by Global Title Translation retains the priority value set by the incoming message.
- `0` - `3` - The priority value for any message crossing into an ITU-I network is changed to this parameter value.

The system default value for the `msgpri2itui` parameter is `dflt`.

`:msgpri2itun` – This parameter specifies the priority value for messages that cross into an ITU-N or ITU-N24 network. The values for this parameter are:

- `dflt` - The priority value for an MTP-routed message is set to 0. A message routed by Global Title Translation retains the priority value set by the incoming message.
- `0` - `3` - The priority value for any message crossing into an ITU-N or ITU-N24 network is changed to this parameter value. Messages crossing into an ANSI network are not affected.

The system default value for the `msgpri2itun` parameter is `dflt`.

These parameters are optional, but at least one of these parameters must be specified in this procedure. If a parameter is not specified, its value is not changed.

1. Display the existing values for the `msgpri2itui` and `msgpri2itun` parameters by entering the `rtrv-ss7opts` command.

   This is an example of the possible output.

```
rlghncxa03w 09-03-17 16:02:05 GMT  EAGLE5 40.1.0

SS7 OPTIONS
-----------------------
MSGPRI2ITUI  dflt
MSGPRI2ITUN  dflt
```

> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in the *Commands Manual*.

2. Change the value of the `msgpri2itui` and `msgpri2itun` parameters.

   The value specified in this step cannot be the same as the value shown in 1.

   If you wish to change the value of the `msgpri2itui` parameter, specify the `msgpri2itui` parameter with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:msgpri2itui=1`

   If you wish to change the value of the `msgpri2itun` parameter, specify the `msgpri2itun` parameter with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:msgpri2itun=2`

   If you wish to change the value of both the `msgpri2itui` and `msgpri2itun` parameters, specify the `msgpri2itui` and `msgpri2itun` parameters with the `chg-ss7opts` command. For this example, enter this command.
   `chg-ss7opts:msgpri2itui=1:msgpri2itun=2`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 09-03-07 00:22:57 GMT  EAGLE5 40.1.0
CHG-SS7OPTS: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-ss7opts` command.

   This is an example of the possible output.

```
rlghncxa03w 09-03-17 16:02:05 GMT  EAGLE5 40.1.0

SS7 OPTIONS
-----------------------
MSGPRI2ITUI     1
MSGPRI2ITUN     2
```

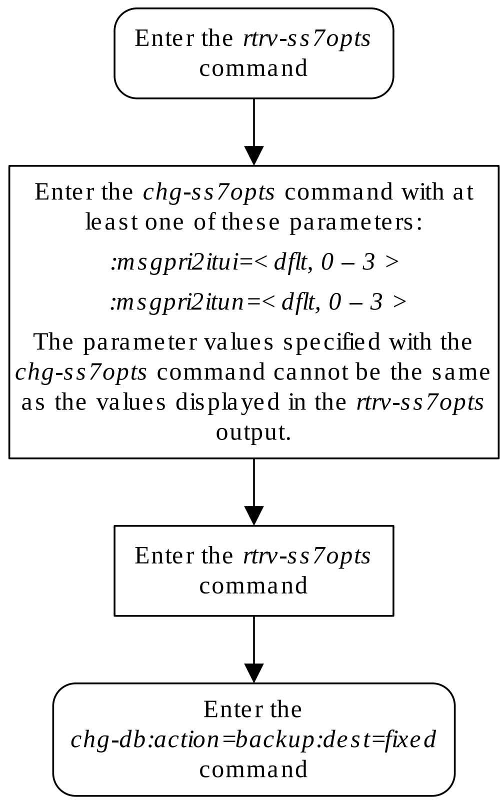
> **Note:**
>
> The `rtrv-ss7opts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-ss7opts` command, see the `rtrv-ss7opts` command description in the *Commands Manual*.

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 3-54 Configuring the Option for Handling Message Priorities for Messages Crossing into ITU-I and ITU-N Networks



3.51 Activating the 6-Way Loadsharing on Routesets Feature

This procedure is used to enable and turn on the 6-Way Loadsharing on Routesets feature with the `enable-ctrl-feat` and `chg-ctrl-feat` commands.

The `enable-ctrl-feat` command enables the 6-Way Loadsharing on Routesets feature by specifying the part number and feature access key for this feature with these parameters:

`:fak` – The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive. If you do not have the feature access key for the proxy point code quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

`:partnum` – The Oracle-issued part number for the 6-Way Loadsharing on Routesets feature, 893019801.

The `enable-ctrl-feat` command requires a valid serial number for the **EAGLE** to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The **EAGLE** is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the **EAGLE** is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the **EAGLE**'s serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Oracle-issued part number of the 6-Way Loadsharing on Routesets feature, 893019801.

`:status=on` – used to turn the 6-Way Loadsharing on Routesets feature on.

> **Caution:**
>
> Once the 6-Way Loadsharing on Routesets feature is turned on, it cannot be turned off.

The status of this feature in the **EAGLE** is shown with the `rtrv-ctrl-feat` command.

After this feature is enabled and turned on, a maximum of six routes in a routeset can be assigned the same relative cost value.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

   ```
   rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
   The following features have been permanently enabled:

   Feature Name              Partnum    Status  Quantity
   Command Class Management  893005801  on      ----
   LNP Short Message Service 893006601  on      ----
   Intermed GTT Load Sharing 893006901  on      ----
   XGTT Table Expansion      893006101  on      4000000
   XMAP Table Expansion      893007710  on      3000
   Large System # Links      893005901  on      1500
   Routesets                 893006401  on      6000
   HC-MIM SLK Capacity       893012707  on      64

   The following features have been temporarily enabled:

   Feature Name              Partnum   Status  Quantity     Trial Period Left
   Zero entries found.

   The following features have expired temporary keys:

   Feature Name              Partnum
   Zero entries found.
   ```

   If the 6-Way Loadsharing on Routesets feature is enabled and turned on, the entry `6-Way LS on Routesets` is shown in the permanently enabled section of the `rtrv-ctrl-feat` output. If the status of the 6-Way Loadsharing on Routesets feature is on, no further action can be performed.

   If the 6-Way Loadsharing on Routesets feature is enabled but not turned on, continue the procedure with 7.

   If the 6-Way Loadsharing on Routesets feature is not enabled, continue the procedure with 2.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in this step shows any controlled features, continue the procedure with Oracle. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
System serial number = nt00001231

System serial number is not locked, yet.
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with Oracle. If the serial number is correct but not locked, continue the procedure with 5. If the serial number is not correct, but is locked, the 6-Way Loadsharing on Routesets feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
System serial number = nt00001231

System serial number is not locked, yet.
```

If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

6. Enable the 6-Way Loadsharing on Routesets feature with the `enable-ctrl-feat` command specifying the part number for the 6-Way Loadsharing on Routesets feature and the feature access key.

   For this example, enter this command.

   `enable-ctrl-feat:partnum=893019801:fak=<6-Way Loadsharing on Routesets feature access key>`

   > **Note:**
   >
   > A temporary feature access key cannot be specified to enable the 6-Way Loadsharing on Routesets feature.

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the 6-Way Loadsharing on Routesets feature, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

7. Turn the 6-Way Loadsharing on Routesets feature on by entering the `chg-ctrl-feat` command with the part number used in Oracle and the `status=on` parameter.

> **Caution:**
>
> Once the 6-Way Loadsharing on Routesets feature is turned on, it cannot be turned off.

For this example, enter this command.

`chg-ctrl-feat:partnum=893019801:status=on`

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
CHG-CTRL-FEAT: MASP A - COMPLTD
```

8. Verify the changes by entering the `rtrv-ctrl-feat`command with the routeset quantity part number specified in 7.

   For this example, enter this command.

   `rtrv-ctrl-feat:partnum=893019801`

   The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
6-Way LS on Routesets     893019801  on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

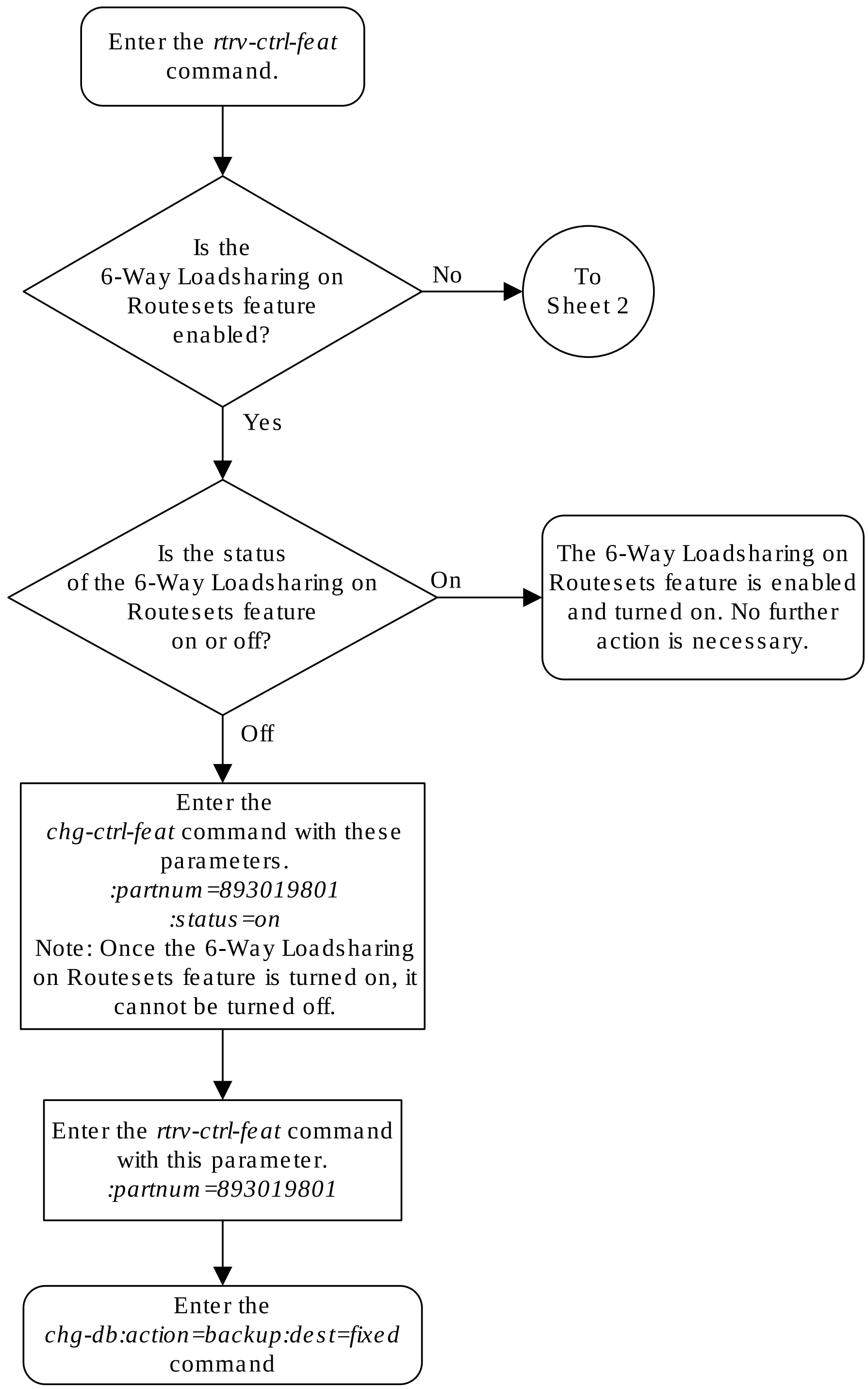
9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

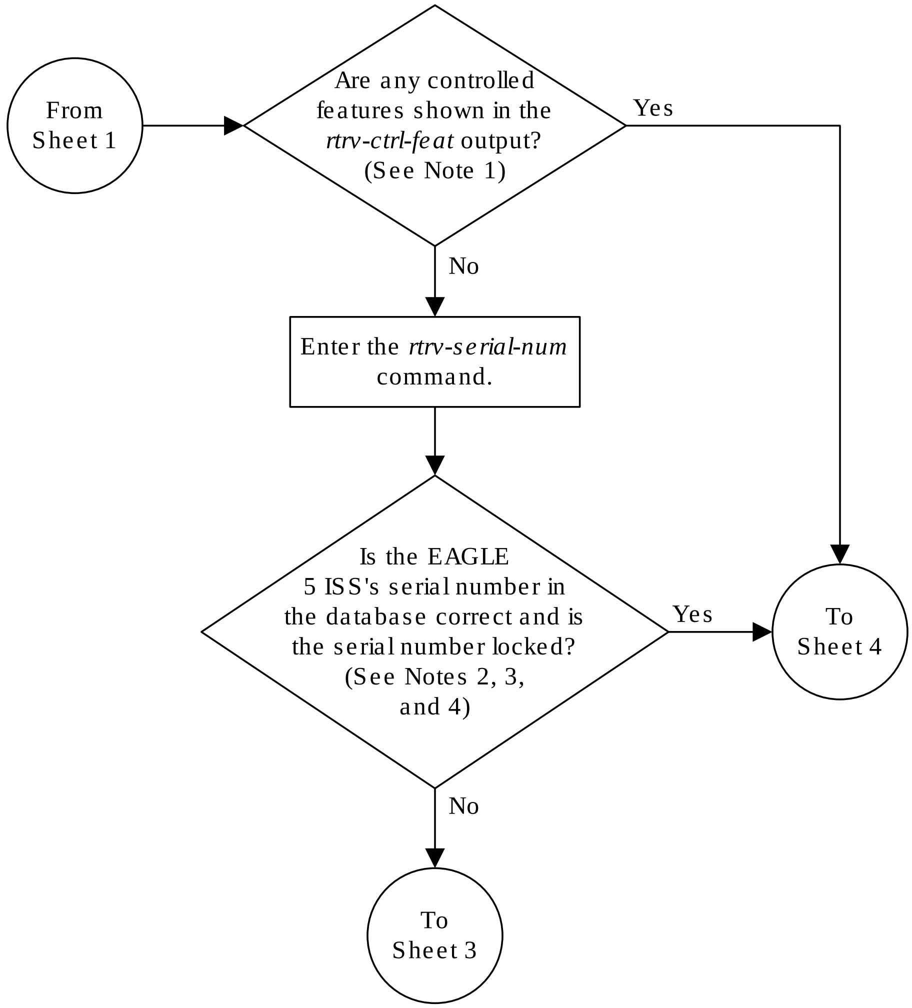
```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
```

```
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 3-55 Activating the 6-Way Loadsharing on Routesets Feature



Sheet 1 of 4



Notes:

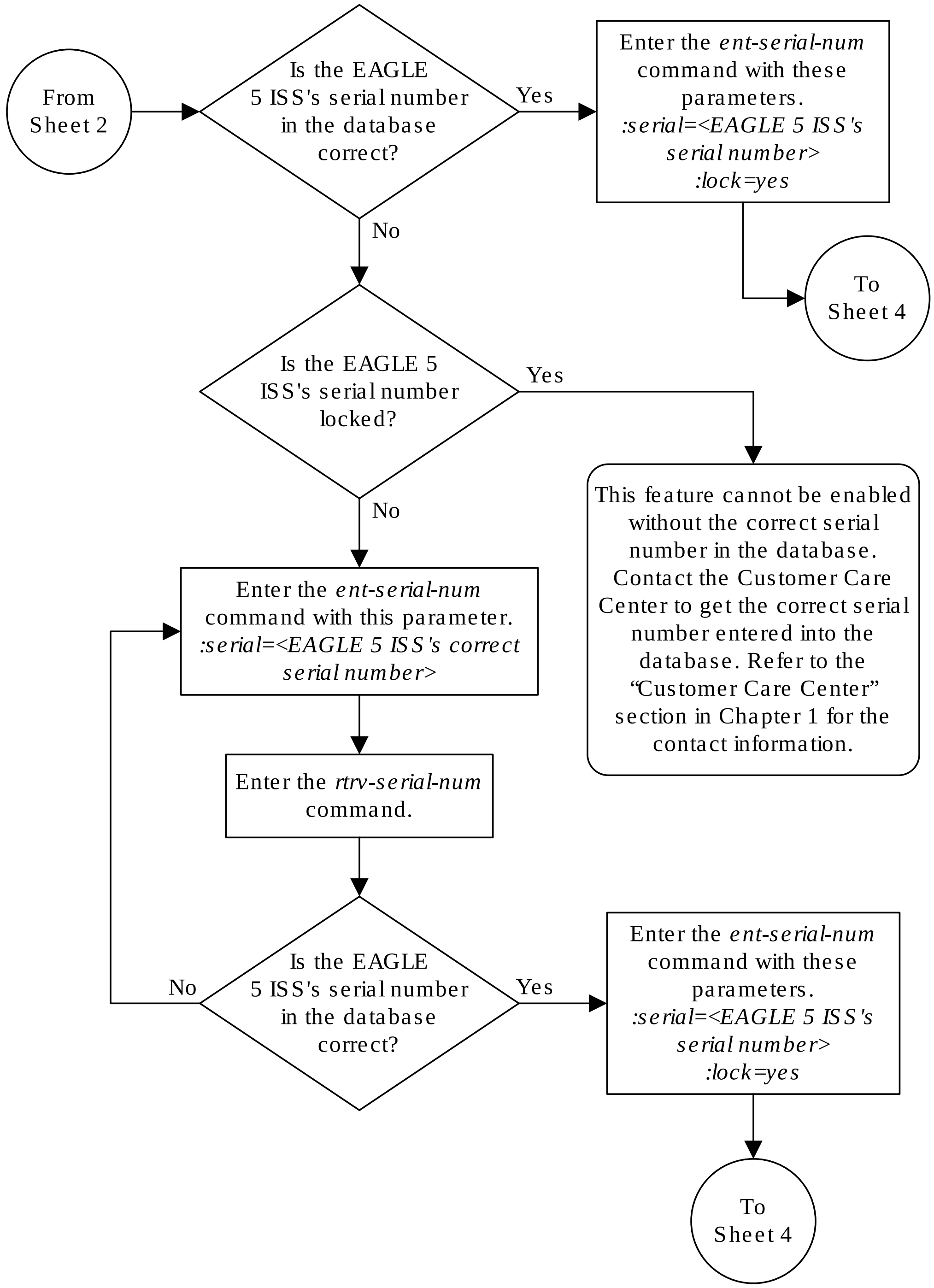
1. If the *rtrv-ctrl-feat* output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the answer to this question is no and the Eagle 5 ISS's serial number must be verified. This is the default entry for the *rtrv-ctrl-feat* output. This entry is shown whether or not the Eagle 5 ISS's serial number is in the database.

2. If the serial number is locked, it cannot be changed.

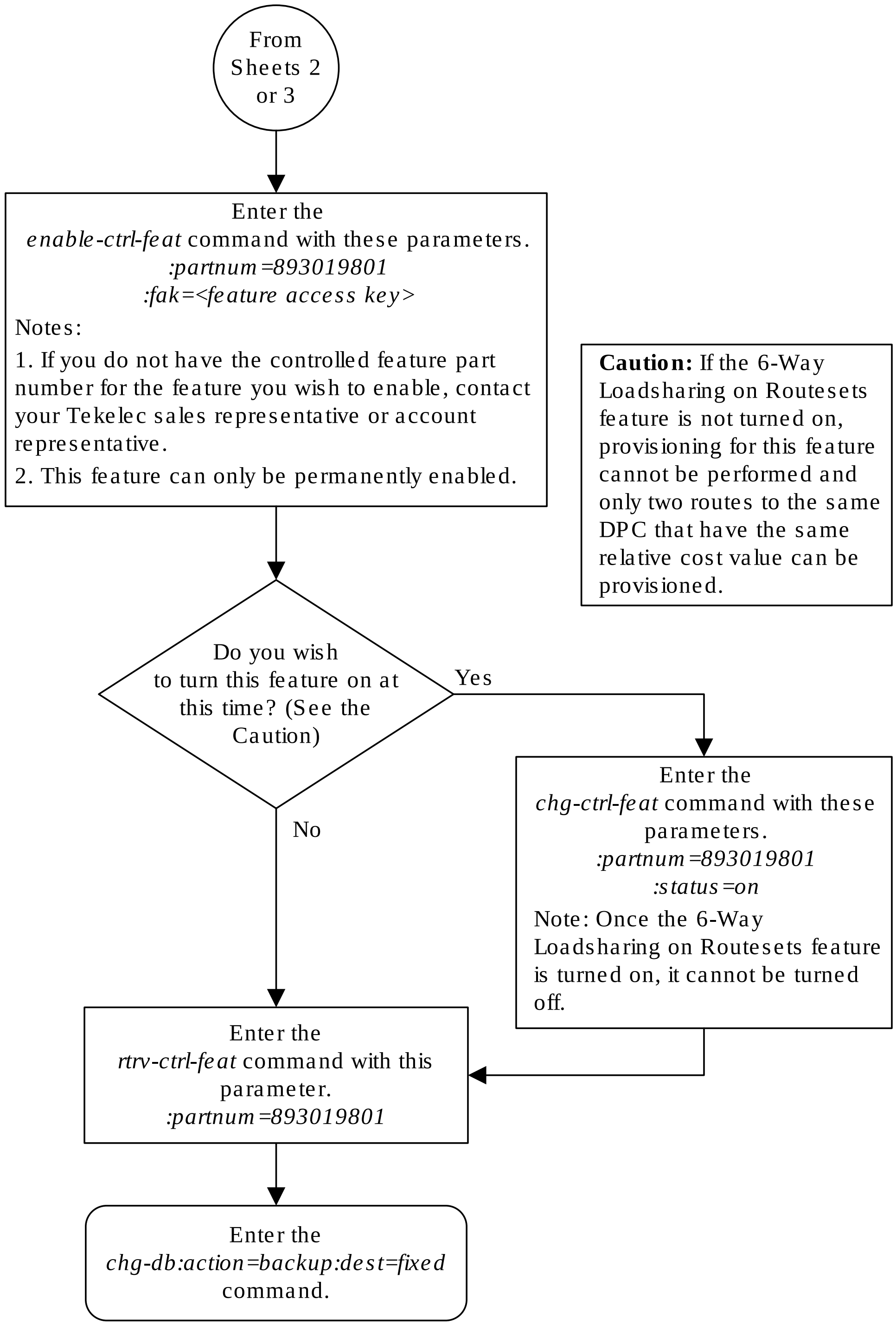
3. If the serial number is not locked, the controlled feature cannot be enabled.

4. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Sheet 2 of 4


From Sheet 2
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
Enter the *ent-serial-num* command with these parameters. *:serial=<EAGLE 5 ISS's serial number> :lock=yes*
To Sheet 4
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the *ent-serial-num* command with this parameter. *:serial=<EAGLE 5 ISS's correct serial number>*
Enter the *rtrv-serial-num* command.
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the *ent-serial-num* command with these parameters. *:serial=<EAGLE 5 ISS's serial number> :lock=yes*
To Sheet 4

Sheet 3 of 4


From Sheets 2 or 3
Enter the *enable-ctrl-feat* command with these parameters.
:partnum=893019801
:fak=<feature access key>
Notes:
1. If you do not have the controlled feature part number for the feature you wish to enable, contact your Tekelec sales representative or account representative.
2. This feature can only be permanently enabled.
Caution: If the 6-Way Loadsharing on Routesets feature is not turned on, provisioning for this feature cannot be performed and only two routes to the same DPC that have the same relative cost value can be provisioned.
Do you wish to turn this feature on at this time? (See the Caution)
Yes
No
Enter the *chg-ctrl-feat* command with these parameters.
:partnum=893019801
:status=on
Note: Once the 6-Way Loadsharing on Routesets feature is turned on, it cannot be turned off.
Enter the *rtrv-ctrl-feat* command with this parameter.
:partnum=893019801
Enter the *chg-db:action=backup:dest=fixed* command.

Sheet 4 of 4

4 Point Code and CIC Translation Configuration

This chapter describes the procedures necessary to configure the Point Code and CIC Translation feature.

4.1 Introduction

The Point Code and CIC Translation (**PCT**) feature allows the EAGLE to change the destination point code (DPC) and originating point code (OPC) of an MTP-routed MSU to previously configured values. This functionality allows external networks to continue using the old point codes by emulating and mapping them to the new real point codes within the networks. The feature can also be used to change the circuit identifier code (**CIC**) for the MSU.

24-bit ITU-N point codes, spare point codes, and private point codes are not supported by PCT entries.

Network nodes can send and receive traffic to and from the emulated point code (**EPC**) without knowing the real point code that is being emulated by the emulated point code. This ability allows the real point code to be changed transparently from the rest of the network, which can continue using the emulated point code to route traffic.

For each incoming MTP-routed MSU, a DPC lookup is performed if the PCT feature is applied either by using the global setting defined by the `chg-stpopts` command or using the setting for the incoming linkset defined by the `chg-lsopts` command. If a translation is found during the DPC lookup, then the DPC of the MSU is replaced by the real point code as the MSU is received by the EAGLE. If the matching translation also contains provisioning for CIC translations, then the CIC of the MSU is changed to the value from the real CIC range.

For each incoming MTP-routed MSU, a DPC lookup and an OPC lookup are performed. If a translation is found during the DPC lookup, then the DPC of the MSU is replaced by the real point code as the MSU is received by the EAGLE. If a real CIC was provisioned in the translation, then the CIC of the MSU is changed to the value from the real CIC range.

If no matching translation is found during the DPC lookup, the OPC lookup is performed. If a translation is found during the OPC lookup, then the OPC of the MSU is replaced by the emulated point code as the MSU leaves the EAGLE. If the matching translation also contains provisioning for CIC translations, then the CIC of the MSU is changed to the value from the emulated CIC range. The OPC lookup is also performed on MTP-routed MSUs which are processed by the service module after feature processing has completed but before the service module sends the MSUs to an outbound LIM for routing. The OPC lookup is performed only on MSUs whose OPC is not the EAGLE's point code, a capability point code, or a secondary point code.

If no matching translation is found during the DPC lookup, the OPC lookup is performed. If a translation is found during the OPC lookup, then the OPC of the MSU is replaced by the emulated point code as the MSU leaves the EAGLE. If an emulated CIC was provisioned in the translation, then the CIC of the MSU is changed to the value from the emulated CIC range. The OPC lookup is also performed on SCCP MSUs after the GTT feature processing has completed but before the service module sends the MSUs to an outbound LIM for routing. The OPC lookup is performed only on MSUs whose OPC is not the EAGLE's point code, a capability point code, or a secondary point code.

To provision the PCT feature, these procedures must be performed.

- Changing the Point Code and CIC Translation Quantity - Used to enable the number of PCT entries that the EAGLE can contain. The EAGLE can contain a maximum of 1000 PCT entries.
- Adding a Point Code and CIC Translation Entry - Used to add a PCT entry to the database.
- Configuring the Point Code and CIC Translation STP Option - Used to configure a system-wide option for controlling the behavior of the PCT feature. This option has three values.
  - `on` – The PCT feature is applied to all MSUs.
  - `off` – The PCT feature is not applied to any MSUs. This is the default value for this option.
  - `lset` – The PCT feature is applied to incoming MSUs or outgoing MSUs on a linkset whose `PCT` option value is `on`.
- Configuring the Point Code and CIC Translation Linkset Option - Used to configure the `PCT` value for a specific linkset when the system-wide option is set to `lset`. This option has two values.
  - `on` – The PCT feature is applied to incoming MSUs or outgoing MSUs on a linkset.
  - `off` – The PCT feature is not applied to incoming MSUs or outgoing MSUs on a linkset. This is the default value for this option.
- Removing a Point Code and CIC Translation Entry - used to remove a PCT entry from the database.

4.2 Changing the Point Code and CIC Translation Quantity

This procedure is used to increase the number of PCT (point code and CIC translations) entries that are allowed in the EAGLE. The EAGLE can contain a maximum of 1000 PCT entries.

The `enable-ctrl-feat` command enables the PCT quantity by specifying the part number for the PCT quantity and the PCT quantity's feature access key with these parameters.

`:fak` – The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive. If you do not have the feature access key for the PCT quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

`:partnum` – The Oracle-issued part number for the PCT quantity shown in Table 4-1.

Table 4-1 PCT Quantities and Part Numbers

Part Number	PCT Quantity
893037201	25
893037202	50

Table 4-1 (Cont.) PCT Quantities and Part Numbers

Part Number	PCT Quantity
893037203	75
893037204	100
893037205	150
893037206	200
893037207	250
893037208	1000

The `enable-ctrl-feat` command requires a valid serial number for the EAGLE to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the EAGLE's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Once the PCT quantity is enabled with the `enable-ctrl-feat` command, the PCT quantity is also turned on. The `chg-ctrl-feat` command is not necessary to turn on the PCT quantity.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
```

```
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If a PCT quantity is shown in the `rtrv-ctrl-feat` output, and the enabled quantity is 1000, this procedure cannot be performed. The EAGLE can contain a maximum of 1000 PCT entries.

If a PCT quantity is shown in the `rtrv-ctrl-feat` output, and the enabled quantity is less than 1000, continue the procedure with Oracle.

If a PCT quantity is not shown in the `rtrv-ctrl-feat` output, continue the procedure by performing one of these steps.

- If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with Oracle.
- If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed. Continue the procedure with 2.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
System serial number = nt00001231
System serial number is not locked.
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
Command Completed
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure withOracle. If the serial number is correct but not locked, continue the procedure with5. If the serial number is not correct, but is locked, a PCT quantity cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to the My Oracle Support (MOS) section for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered into 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
System serial number = nt00001231
System serial number is not locked.
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
Command Completed
```

   If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Enable a PCT quantity with the `enable-ctrl-feat` command specifying the part number for the point code, shown in Table 4-1, and CIC translation quantity and the feature access key.

   For this example, enter this command.

   `enable-ctrl-feat:partnum=893037203:fak=<feature access key for 75 PCT entries>`

   Note:

   A temporary feature access key cannot be specified to enable the routeset quantity.

> **Note:**
>
> The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the PCT quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

7. Verify the changes by entering the `rtrv-ctrl-feat` command with the PCT quantity part number specified in Oracle.

   For this example, enter this command.

   `rtrv-ctrl-feat:partnum=893037203`

   The following is an example of the possible output.

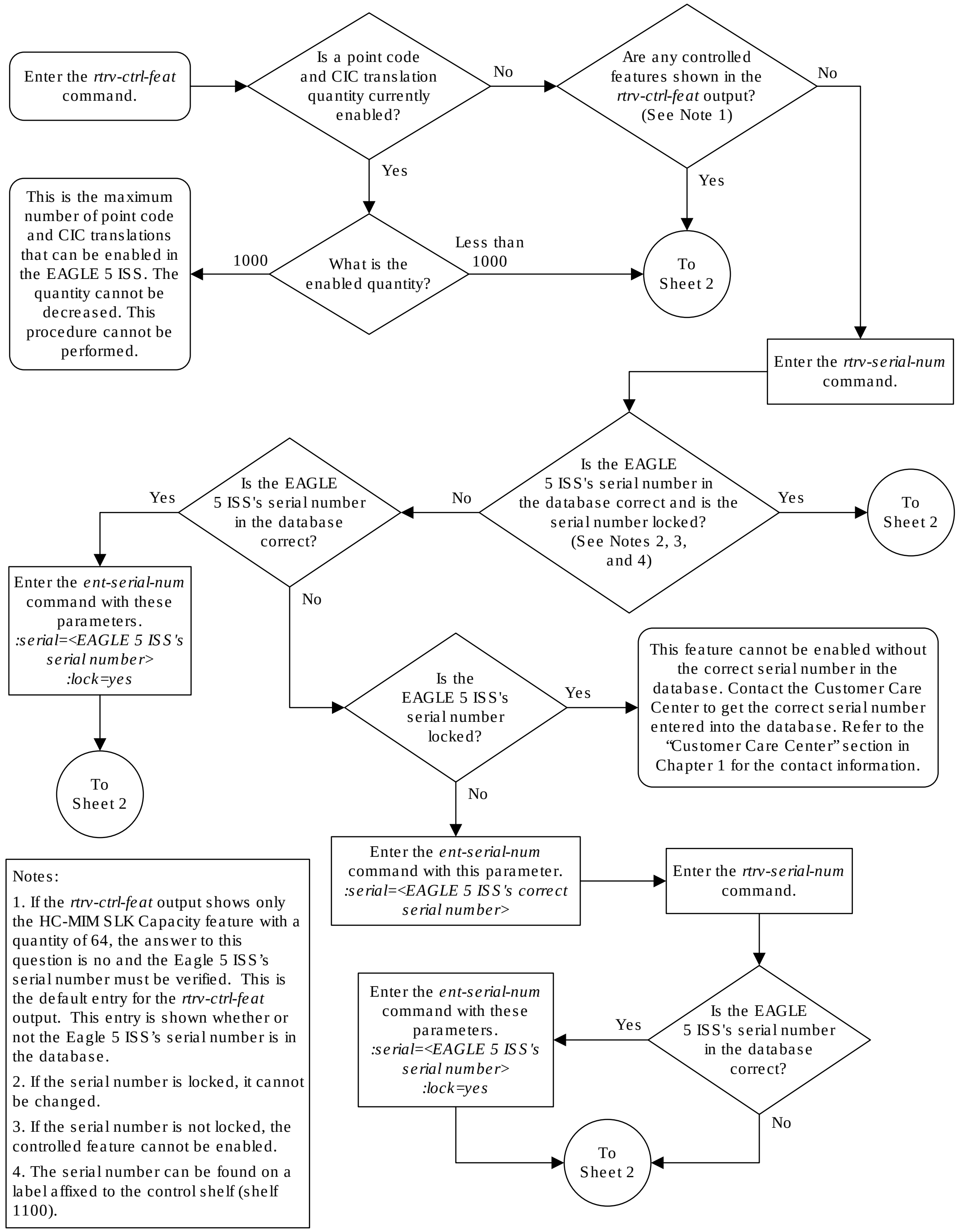
```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
PC & CIC Translation      893037203  on      75

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

8. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

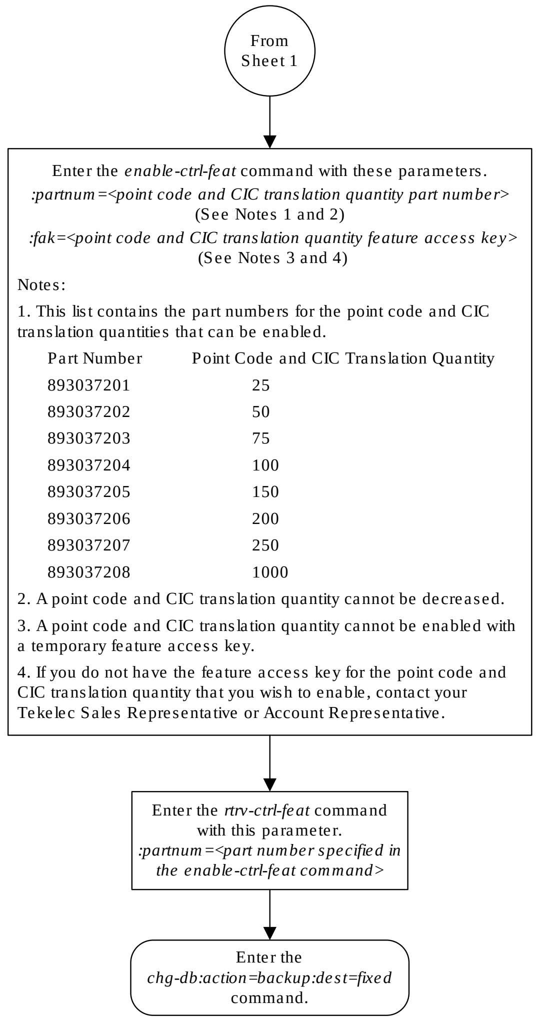
   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 4-1 Changing the Point Code and CIC Translation Quantity



Sheet 1 of 2



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4.3 Adding a Point Code and CIC Translation Entry

This procedure is used to add a PCT (point code and CIC translation) entry to the database, using the `ent-pct` command.

The `ent-pct` command uses the parameters shown in Table 4-2.

Table 4-2 ENT-PCT Parameters

Parameter	Range of Values	Type of Parameter	Default Values	Description
EPC/EPCA/ EPCI/EPCN	ANSI, ITU-I, or 14-bit ITU-N Point Code	Mandatory	N/A	Emulated point code. See Notes 1 through 8.
REALPC/ REALPCA/ REALPCI/ REALPCN	ANSI, ITU-I, or 14-bit ITU-N Point Code	Mandatory	N/A	Real point code. See Notes 1 through 9.
FILTPC/FILTPCA/ FILTPCI/FILTPCN	ANSI, ITU-I, 14-bit ITU-N Point Code, or wildcard (*)	Optional	wildcard (*)	Filter point code. See Notes 2 through 5, 8 through 11, and 25.
SI	0 (Network Management) 3 (SCCP 4 (TUP) 5 (ISUP) 13 (ANSI Q.BICC) wildcard (*)	Optional	wildcard (*)	Service indicator value. See Notes 24 and 25.
ECICS	See Note 12	Optional	wildcard (*)	Start value of a range of emulated CIC values. See Notes 13, 19, 20, and 25.
ECICE	See Note 12	Optional	wildcard (*)	End value of a range of emulated CIC values. See Notes 13, 14, 17, 18, 19, 20, and 25.
RCICS	See Note 12	Optional	wildcard (*)	Start value of a range of real CIC values. See Notes 13, 15, 19, 20, and 25.
RCICE	See Note 12	Optional	wildcard (*)	End value of a range of real CIC values. See Notes 13, 14, 16, 18, 19, 20, and 25.
RELCAUSE	0 - 127	Optional	0	Release cause value. See Notes 21 and 22.
SSN	0 - 255 or wildcard (*)	Optional	wildcard (*)	Subsystem number. See Notes 23 and 25.

Table 4-2 (Cont.) ENT-PCT Parameters

Parameter	Range of Values	Type of Parameter	Default Values	Description

Notes:

1. The ANSI point code value must be a full point code and not a cluster point code or a network routing point code.
2. The point code value cannot be shown in the `rtrv-sid` output.
3. ITU-I and 14-bit ITU-N point code values cannot be a spare point code. None of the point code values can be a private point code.
4. The network type of the emulated point code, real point code, and filter point code (if specified) values must be the same.
5. The group code of the 14-bit ITU-N emulated point code, real point code, and filter point code (if specified) values must be the same.
6. There can be a maximum of 100 PCT entries that use the same emulated point code value. There can be a maximum of 100 PCT entries that use the same real point code value.
7. A maximum of 250 different emulated point code values can be used in all the PCT entries that are provisioned. A maximum of 250 different real point code values can be used in all the PCT entries that are provisioned.
8. Duplicate entries with these key combinations are not allowed.
   - emulated point code + filter point code + service indicator + subsystem number/(range of emulated CIC values)
   - real point code + filter point code + service indicator + subsystem number/(range of real CIC values)
9. The real point code and filter point code value must be shown in the `DPC` column of the `rtrv-rte` output. There must be at least one route assigned the `DPC` value.
10. The ANSI filter point code values can be a full point code, a cluster point code, or a network routing point code.
11. Only one filter point code value can be specified with the PCT entry, either an ANSI filter point code (`filtpc/filtpca`), an ITU-I filter point code (`filtpci`), or a 14-bit ITU-N filter point code (`filtpcn`).
12. These are the values for the ECICS, ECICE, RCICS, and RCICE parameter values.
    - Service indicator value 4 - 0 to 4095 or wildcard (*).
    - Service indicator value 5 (with an ITU point code) - 0 to 4095 or wildcard (*).
    - Service indicator value 5 (with an ANSI point code) - 0 to 16383 or wildcard (*).
    - Service indicator value 13 - 0 to 4294967295 or wildcard (*).
13. The service indicator parameter with a value of 4, 5, or 13 must be specified.
14. If the ECICE parameter is specified, the ECICS parameter must be specified. If the RCICE parameter is specified, the RCICS parameter must be specified.
15. If the RCICS parameter is specified, the ECICS parameter must be specified.
16. If the ECICS, ECICE, and RCICS parameters are specified, the RCICE parameter must be specified.
17. If the ECICS, RCICS, and RCICE parameters are specified, the ECICE parameter must be specified.
18. The value of the ECICE parameter must be greater or equal to the ECICS parameter value. The value of the RCICE parameter must be greater or equal to the RCICS parameter value.

Table 4-2 (Cont.) ENT-PCT Parameters

Parameter	Range of Values	Type of Parameter	Default Values	Description

19. If a range of emulated CIC and real CIC values are specified, the difference between the ECICS and ECICE values must be the same as the difference between the RCICS and RCICE values. Where CIC translations are not applied uniformly across a trunk group, it is recommended that the CIC should be provisioned in ranges such that a trunk is not split across PCT translations.
20. If the `epc/epca/epci/epcn` parameter value is equal to the `realpc/realpca/realpci/realpcn` parameter value, the range of emulated CIC values cannot be the same as the range of real CIC values.
21. The service indicator parameter value must be either 5 or 13.
22. The ECICS parameter must be specified.
23. The service indicator parameter value must be 3.
24. If the service indicator value is 0 or wildcard (*), only the emulated point code, real point code, and filter point code parameters can be specified.
25. The wildcard (*) value indicates that the parameter is not part of the key to find the matching translation.

To add a PCT entry, a PCT quantity must be enabled. Adding the new PCT entry cannot exceed the enabled PCT quantity. The enabled PCT quantity is shown in the `rtrv-pct` output. The EAGLE can contain a maximum of 1000 PCT entries. Perform the Changing the Point Code and CIC Translation Quantity procedure to enable the required PCT quantity if adding the new PCT entry will exceed the enabled PCT quantity and the current PCT quantity is less than 1000.

Canceling the `RTRV-RTE` Command

Because the `rtrv-rte` command used in this procedure can output information for a long period of time, the `rtrv-rte` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-rte` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-rte` command was entered
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-rte` command was entered
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-rte` command was entered, from another terminal other than the terminal where the `rtrv-rte` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, refer to *Commands User's Guide*.

1. Display the current PCT entries by entering the `rtrv-pct` command.

This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA              FILTPCA           REALPCA       SI  SSN  RELCAUSE
    001-001-001       *                 002-002-002    5  ---   10

    ECICS = 10           ECICE = 20
    RCICS = 30           RCICE = 40

    EPCI              FILTPCI           REALPCI       SI  SSN  RELCAUSE
    1-001-2           2-002-2           2-002-2        3   10  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    EPCN              FILTPCN           REALPCN       SI  SSN  RELCAUSE
    04-11-0-fr        *                 0-6-4-0-fr     *  ---  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------


 Unique EPC    is 3 of 250
 Unique RealPC is 3 of 250

 PCT table is (3 of 1000) 1% full.
```

If adding the PCT entry will exceed the enabled PCT quantity and the enabled PCT quantity is 1000, this procedure cannot be performed.

If adding the PCT entry will exceed the enabled PCT quantity and the enabled PCT quantity is less than 1000, perform the Changing the Point Code and CIC Translation Quantity procedure to enable the new PCT quantity. The new quantity must be greater than the current enabled quantity.

If adding the PCT entry will not exceed the enabled PCT quantity, or the Changing the Point Code and CIC Translation Quantity procedure has been performed, continue the procedure by performing one of these steps.

- If no entries are displayed in the `rtrv-pct` output, continue the procedure with 3.
- If entries are displayed in the `rtrv-pct` output, continue the procedure with 2.

2. There can be a maximum of 100 PCT entries that use the same emulated point code value. There can be a maximum of 100 PCT entries that use the same real point code value.

   The EAGLE contain a maximum of 250 unique emulated point code values and 250 unique real point code values.

   If adding the new PCT entry will not exceed these maximum quantities, continue the procedure with 3.

If adding the new PCT entry will exceed these maximum quantities, the new PCT entry must contain one or more of these point code values, depending on the quantity that will be exceeded.

- If the EAGLE contains 100 PCT entries that use the same emulated point code value, a different emulated point code value must be used for the new PCT entry.
- If the EAGLE contains 100 PCT entries that use the same real point code value, a different real point code value must be used for the new PCT entry.
- If the EAGLE contains a maximum of 250 unique emulated point code values, the new entry must contain one of these emulated point code values.
- If the EAGLE contains a maximum of 250 unique real point code values, the new entry must contain one of these real point code values.
- Continue the procedure with 3

3. Display the self-identification of the EAGLE using the `rtrv-sid` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT  EAGLE5 43.0.0
   PCA              PCI          PCN                  CLLI
PCTYPE
   100-100-100      3-75-7       7-9-8-1-fr           rlghncxa03w       OTHER

   CPCA
   102-002-002        102-002-003        102-002-004      102-002-005
   102-002-006        102-002-007        102-002-008      102-002-009
   004-002-001        004-003-003        050-060-070

   CPCA (LNP)
   005-005-002        005-005-004        005-005-005

   CPCI
   1-002-1            1-002-2            1-002-3          1-002-4
   2-001-1            7-222-7

   CPCN
   0-1-9-0-fr         0-1-11-2-fr        0-1-14-0-fr      0-2-0-2-fr
   0-3-2-0=fr         0-3-7-0-fr         0-3-12-0-fr
```

   The emulated point code, real point code, or filter point code values cannot be shown in the `rtrv-sid` output.

4. Display the current secondary point codes, using the `rtrv-spc` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
SPC (Secondary Point Codes)

SPCA
     001-010-010
```

```
     002-010-010
     003-010-010

SPC-I
         1-253-5
         2-254-6
         3-255-7

SPC-N
        10-01-11-1-fr
        13-02-12-0-fr

SPC-N24

none

Secondary Point Code table is (8 of 40) 20% full
```

The emulated point code, real point code, and filter point code values cannot be shown in the `rtrv-spc` output.

5. Display the current route configuration using the `rtrv-rte` command. This is an example of the possible output.

```
rlghncxa03w 10-12-07 11:43:04 GMT  EAGLE5 43.0.0
Extended Processing Time may be Required

   DPCA           ALIASI     ALIASN/N24     LSN        RC     APCA
   140-012-004    1-111-1    10-13-12-1-fr ls000001    10
240-012-002
                                           ls000002    10
240-012-002
                                           ls000003    20
240-012-002
                                           ls000004    30
240-012-002
                                           ls000005    40
240-012-002
                                           ls000006    50
240-012-002
                                               RTX:No   CLLI=dp1
   140-012-005 1-111-2       10-13-12-2-fr ls000001    10
240-012-002
                                           ls000002    10
240-012-002
                                           ls000003    20
240-012-002
                                           ls000004    30
240-012-002
                                           ls000005    40
240-012-002
                                           ls000006    50
240-012-002
```

```
                                        RTX:No   CLLI=dp2
DPCI        ALIASN/N24       ALIASA       LSN          RC     APC
2-234-5     11-13-3-3-fr     240-111-111  ls100001     10     1-234-5
                                          ls100002     10     1-234-6
                                          ls100003     20     1-234-7
                                          ls100004     30     1-234-1
                                          ls100005     40     1-234-2
                                          ls100006     50     1-234-3
                                        RTX:No   CLLI=idp1
DPCN              ALIASA          ALIASI  LSN          RC     APC
12-12-13-3-fr     011-222-111     0-001-1 ls200001     10     10-13-9-3
                                          ls200002     10     10-13-10-0
                                          ls200003     20     10-13-10-1
                                          ls200004     30     10-13-10-2
                                          ls200005     40     10-13-10-3
                                          ls200006     50     10-13-11-0
                                        RTX:No   CLLI=ndp1

DPCN24            ALIASA          ALIASI  LSN          RC     APC
```

The real point code value, and the filter point code value if a point code value is specified for the filter point code parameter, must be the DPC of a routeset that contains at least one route.

The real point code value must be a full point code and cannot be a spare point code, a private point code, or a 24-bit ITU-N point code.

The filter point code value can be a full point code, a cluster point code, or a network routing point code. The filter point code value cannot be a spare point code, a private point code, or a 24-bit ITU-N point code.

The emulated point code, real point code, and filter point code values must be the same network type, either ANSI, ITU-I, or a 14-bit ITU-N point codes.

If the 14-bit ITU-N point codes contain group codes, the group codes of the emulated point code, real point code, and filter point code values must be the same.

If the required point codes for the PCT entry are not shown in the `rtrv-rte` output, perform one of these procedures to add the routes with the required point code values.

- Adding a Route Containing an SS7 DPC
- Adding a Route Containing a Cluster Point Code
- Adding a Route Containing an IPGWx Linkset

If the required point codes for the PCT entry are shown in the `rtrv-rte` output, or one of the Adding a Route procedures was performed, continue the procedure with 6.

6. Add the PCT entry by entering the `ent-pct` command.

   The `epc`/`epca`/`epci`/`epcn` and `realpc`/`realpca`/`realpci`/`realpcn` must be specified with the `ent-pct` command. All other parameters are optional.

   The values for the `ent-pct` parameters and the rules for specifying these parameters are shown in Table 4-2.

   For this example, enter these commands.

```
ent-
pct:epca=007-007-007:realpca=008-008-008:filtpca=009-009-009
:si=3:ssn=135
```

```
ent-
pct:epca=007-007-007:realpca=008-008-008:filtpca=010-010-010
:si=5 :ecics=200:ecice=224:rcics=300:rcice=324:relcause=50
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 10-12-17 15:35:05 GMT EAGLE5 43.0.0
ENT-PCT: MASP A - COMPLTD
```

7. Verify the changes using the `rtrv-pct` command with the parameters and values that were entered in 6.

   For this example, enter these commands.

```
rtrv-
pct:epca=007-007-007:realpca=008-008-008:filtpca=009-009-009
:si=3:ssn=135
```

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA             FILTPCA          REALPCA      SI  SSN  RELCAUSE
    007-007-007      009-009-009      008-008-008   3  135  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

 Unique EPC    is 4 of 250
 Unique RealPC is 4 of 250

 PCT table is (5 of 1000) 1% full.
```

```
rtrv-
pct:epca=007-007-007:realpca=008-008-008:filtpca=010-010-010
:si=5 :ecics=200:ecice=224:rcics=200:rcice=224:relcause=50
```

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA             FILTPCA          REALPCA      SI  SSN  RELCAUSE
    007-007-007      010-010-010      008-008-008   5  ---   50

    ECICS = 200         ECICE = 224
    RCICS = 300         RCICE = 324

 Unique EPC    is 4 of 250
 Unique RealPC is 4 of 250
```

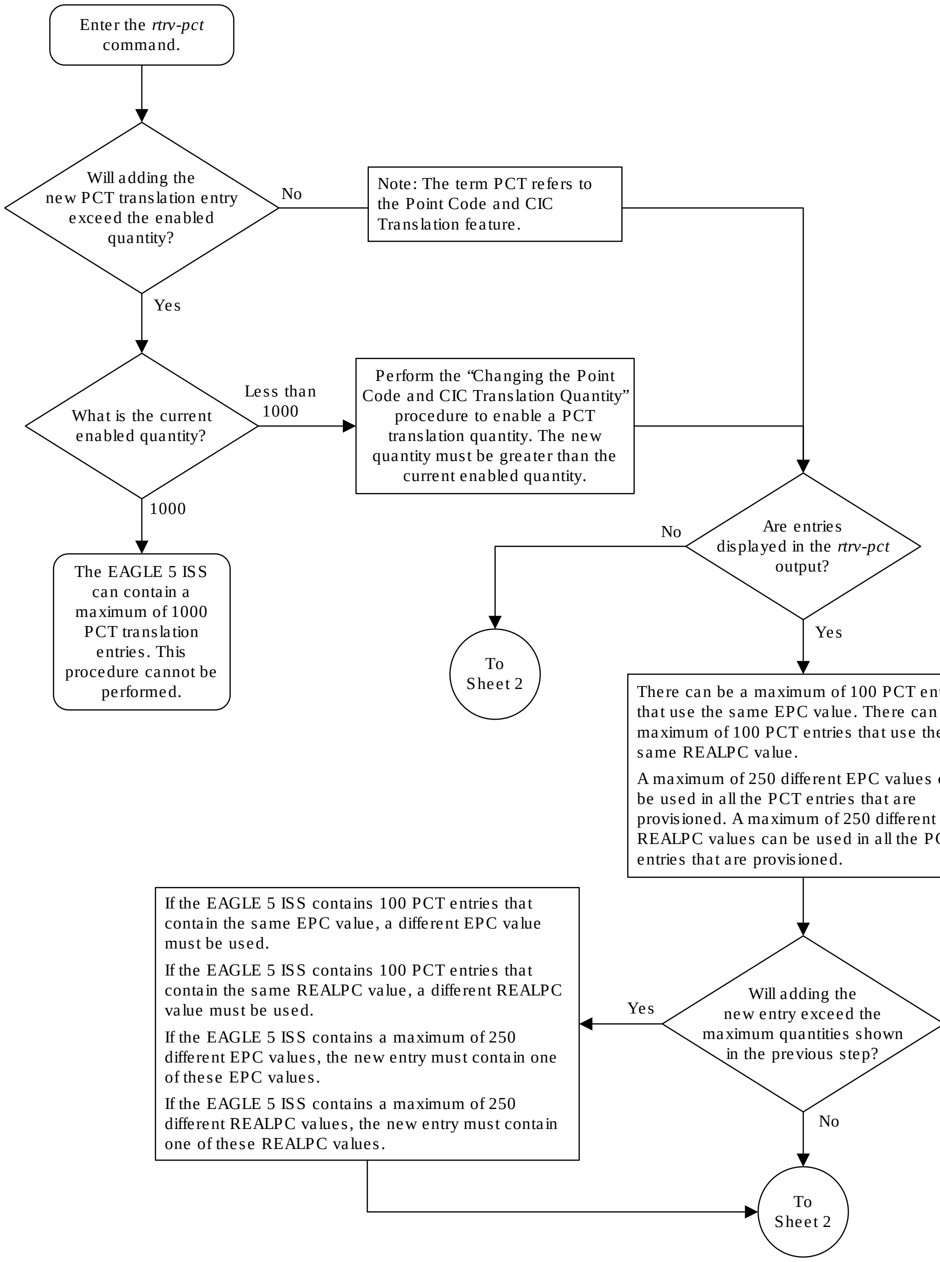
```
PCT table is (5 of 1000) 1% full.
```

8. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure 4-2 Adding a Point Code and CIC Translation Entry



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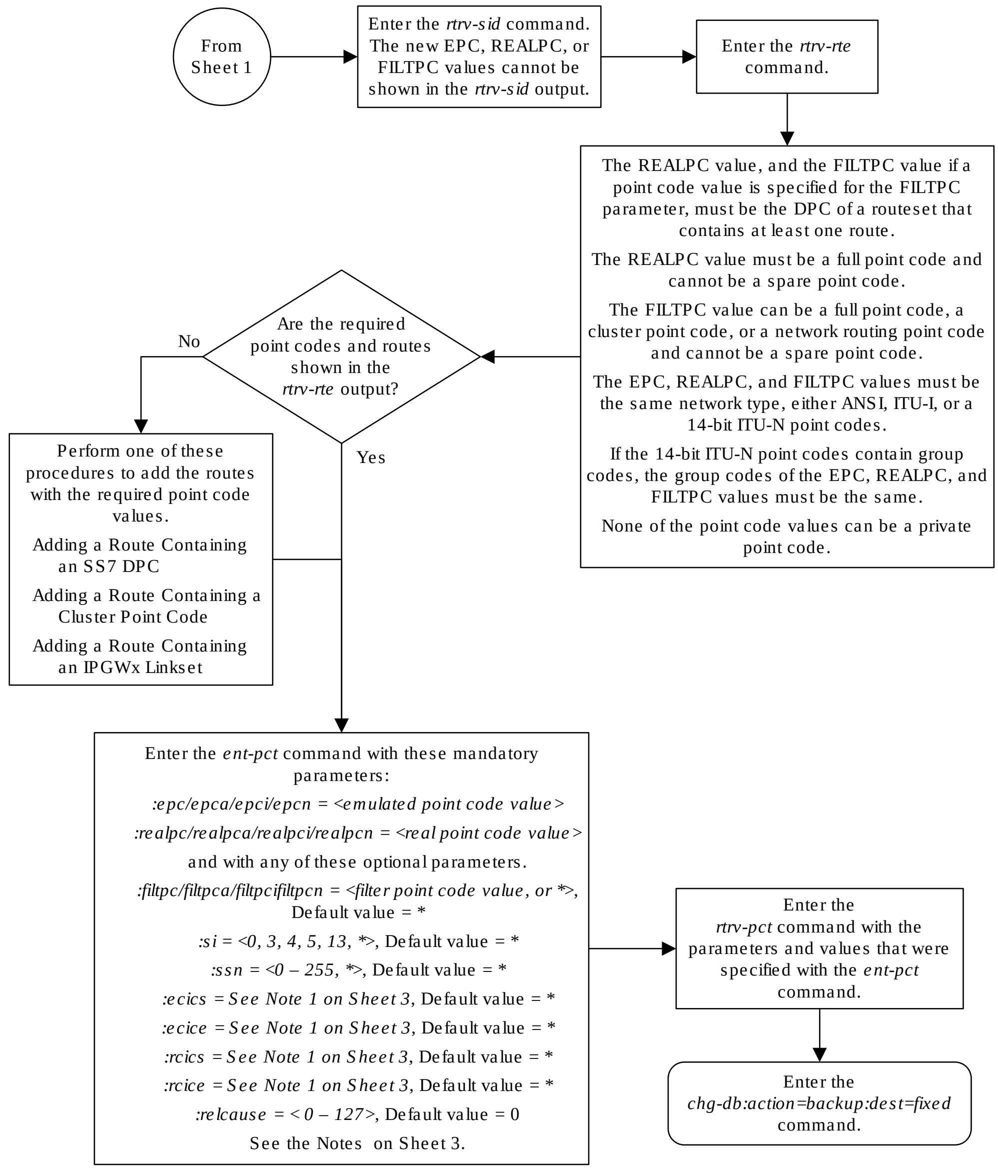
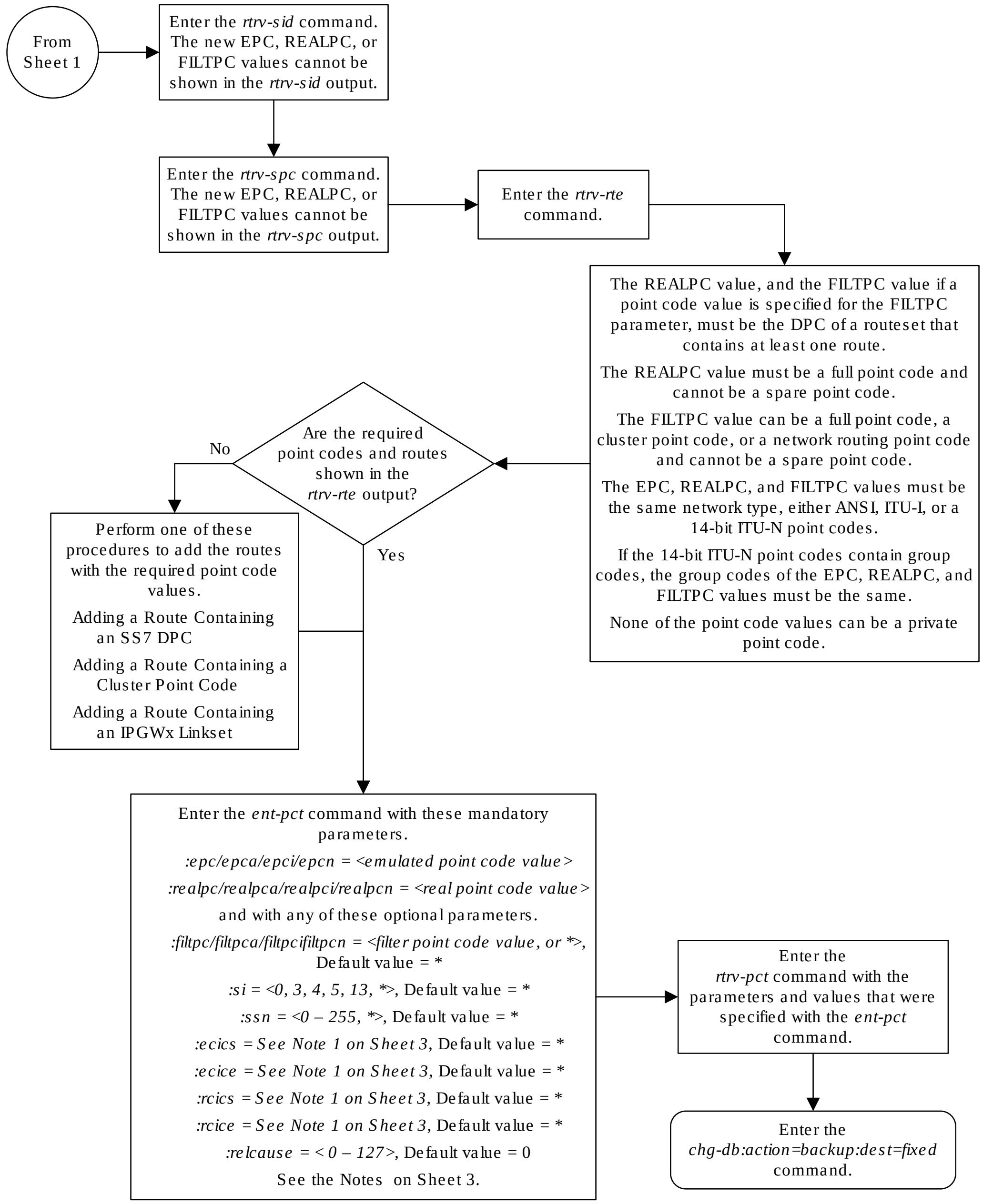

From Sheet 1
Enter the *rtrv-sid* command. The new EPC, REALPC, or FILTPC values cannot be shown in the *rtrv-sid* output.
Enter the *rtrv-rte* command.
The REALPC value, and the FILTPC value if a point code value is specified for the FILTPC parameter, must be the DPC of a routeset that contains at least one route.
The REALPC value must be a full point code and cannot be a spare point code.
The FILTPC value can be a full point code, a cluster point code, or a network routing point code and cannot be a spare point code.
The EPC, REALPC, and FILTPC values must be the same network type, either ANSI, ITU-I, or a 14-bit ITU-N point codes.
If the 14-bit ITU-N point codes contain group codes, the group codes of the EPC, REALPC, and FILTPC values must be the same.
None of the point code values can be a private point code.
Are the required point codes and routes shown in the *rtrv-rte* output?
No
Yes
Perform one of these procedures to add the routes with the required point code values.
Adding a Route Containing an SS7 DPC
Adding a Route Containing a Cluster Point Code
Adding a Route Containing an IPGWx Linkset
Enter the *ent-pct* command with these mandatory parameters:
:epc/epca/epci/epcn = <*emulated point code value*>
:realpc/realpca/realpci/realpcn = <*real point code value*>
and with any of these optional parameters.
:filtpc/filtpca/filtpcifiltpcn = <*filter point code value, or* *>, Default value = *
:si = <*0, 3, 4, 5, 13,* *>, Default value = *
:ssn = <*0 – 255,* *>, Default value = *
:ecics = *See Note 1 on Sheet 3*, Default value = *
:ecice = *See Note 1 on Sheet 3*, Default value = *
:rcics = *See Note 1 on Sheet 3*, Default value = *
:rcice = *See Note 1 on Sheet 3*, Default value = *
:relcause = < *0 – 127*>, Default value = 0
See the Notes on Sheet 3.
Enter the *rtrv-pct* command with the parameters and values that were specified with the *ent-pct* command.
Enter the *chg-db:action=backup:dest=fixed* command.


From Sheet 1
Enter the *rtrv-sid* command. The new EPC, REALPC, or FILTPC values cannot be shown in the *rtrv-sid* output.
Enter the *rtrv-spc* command. The new EPC, REALPC, or FILTPC values cannot be shown in the *rtrv-spc* output.
Enter the *rtrv-rte* command.
The REALPC value, and the FILTPC value if a point code value is specified for the FILTPC parameter, must be the DPC of a routeset that contains at least one route.
The REALPC value must be a full point code and cannot be a spare point code.
The FILTPC value can be a full point code, a cluster point code, or a network routing point code and cannot be a spare point code.
The EPC, REALPC, and FILTPC values must be the same network type, either ANSI, ITU-I, or a 14-bit ITU-N point codes.
If the 14-bit ITU-N point codes contain group codes, the group codes of the EPC, REALPC, and FILTPC values must be the same.
None of the point code values can be a private point code.
Are the required point codes and routes shown in the *rtrv-rte* output?
No
Yes
Perform one of these procedures to add the routes with the required point code values.
Adding a Route Containing an SS7 DPC
Adding a Route Containing a Cluster Point Code
Adding a Route Containing an IPGWx Linkset
Enter the *ent-pct* command with these mandatory parameters.
:epc/epca/epci/epcn = <*emulated point code value*>
:realpc/realpca/realpci/realpcn = <*real point code value*>
and with any of these optional parameters.
:filtpc/filtpca/filtpci/filtpcn = <*filter point code value, or **>, Default value = *
:si = <*0, 3, 4, 5, 13, **>, Default value = *
:ssn = <*0 – 255, **>, Default value = *
:ecics = *See Note 1 on Sheet 3*, Default value = *
:ecice = *See Note 1 on Sheet 3*, Default value = *
:rcics = *See Note 1 on Sheet 3*, Default value = *
:rcice = *See Note 1 on Sheet 3*, Default value = *
:relcause = <*0 – 127*>, Default value = 0
See the Notes on Sheet 3.
Enter the *rtrv-pct* command with the parameters and values that were specified with the *ent-pct* command.
Enter the *chg-db:action=backup:dest=fixed* command.

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Notes:

1. The value of the *ecics/ecice* and *rcics/rcice* parameters is dependent on the value of the *si* parameter.

    If the *si* value is 4, the value of the *ecics/ecice* and *rcics/rcice* parameters is 0 – 4095 or *.

    If the *si* value is 5 and the entry contains ITU point codes, the value of the *ecics/ecice* and *rcics/rcice* parameters is 0 – 4095 or *.

    If the *si* value is 5 and the entry contains ANSI point codes, the value of the *ecics/ecice* and *rcics/rcice* parameters is 0 – 16383 or *.

    If the *si* value is 13, the value of the *ecics/ecice* and *rcics/rcice* parameters is 0 – 4294967295 or *.

2. If the *ssn* parameter is specified, the *si* value must be specified with the value 3.
3. If the *ecics/ecice* and *rcics/rcice* parameters are specified, the *si* parameter must be specified with the values 4, 5, or 13.
4. The *epc/epca/epci/epcn* parameter value must be a full point code and cannot be a spare point code.
5. If the *relcause* parameter is specified, the *si* parameter value must be 5 or 13, and the *ecics* parameter must be specified.
6. If a range of emulated CIC values is specified, the *ecics* and *ecice* parameters must be specified. The *ecice* parameter value must be equal to or greater than the *ecics* parameter value.
7. If a range of real CIC values is specified, the *rcics* and *rcice* parameters must be specified. The *rcice* parameter value must be equal to or greater than the *rcics* parameter value.
8. If the *ecice* parameter is specified, the *ecics* parameter must be specified.
9. If the *rcice* parameter is specified, the *rcics* parameter must be specified.
10. If the *rcics* parameter is specified, the *ecics* parameter must be specified.
11. If the *ecics*, *ecice*, and *rcics* parameters are specified, the *rcice* parameter must be specified.
12. If the *ecics*, *rcics*, and *rcice* parameters are specified, the *ecice* parameter must be specified.
13. If a range of emulated CIC and real CIC values are specified, the difference between the ECICS and ECICE values must be the same as the difference between the RCICS and RCICE values. Where CIC translations are not applied uniformly across a trunk group, it is recommended that the CIC should be provisioned in ranges such that a trunk is not split across PCT translations.
14. If the *epc/epca/epci/epcn* parameter value is equal to the *realpc/realpca/realpci/realpcn* parameter value, the range of emulated CIC values cannot be the same as the range of real CIC values.
15. Duplicate values for these key combinations are not allowed.

    epc/epca/epci/epcn + filtpc/filtpca/filtpci/filtpcn + si + ssn/(ecics/ecice)

    realpc/realpca/realpci/realpcn + filtpc/filtpca/filtpci/filtpcn + si + ssn/(rcics/rcice)

16. Only one filter point code value can be specified with the PCT entry, either an ANSI filter point code (*filtpc/filtpca*), an ITU-I filter point code (*filtpci*), or a 14-bit ITU-N filter point code (*filtpcn*).
17. If the *si* parameter value is 0 or wildcard (*), only the *epc/epca/epci/epcn, realpc/realpca/realpci/realpcn, or filtpc/filtpca/filtpci/filtpcn* parameters can be specified.
18. The value * is a wildcard value. The wildcard value indicates that the parameter is not part of the key to find the matching translation.

Sheet 3 of 3

4.4 Removing a Point Code and CIC Translation Entry

This procedure is used to remove a PCT (point code and CIC translation) entry from the database, using the `dlt-pct` command.

The `dlt-pct` command uses these parameters.

`:epc/epca/epci/epcn` – The emulated point code of the PCT entry shown in the `EPCA`, `EPCI` or `EPCN` columns.

`:realpc/realpca/realpci/realpcn` – The real point code of the PCT entry shown in the `REALPCA`, `REALPCI` or `REALPCN` columns.

`:filtpc/filtpca/filtpci/filtpcn` – The filter point code of the PCT entry shown in the `FILTPCA`, `FILTPCI` or `FILTPCN` columns.

`:si` – The service indicator value of the PCT entry shown in the `SI` column.

`:ssn` – The subsystem number value of the PCT entry shown in the `SSN` column.

`:ecics` – The emulated CIC start value of the PCT entry shown in the `ECICS` field.

`:ecice` – The emulated CIC end value of the PCT entry shown in the `ECICE` field.

`:rcics` – The real CIC start value of the PCT entry shown in the `RCICS` field.

`:rcice` – The real CIC end value of the PCT entry shown in the `RCICE` field.

The PCT entry that is being removed must exist in the database. The values for the parameters of the PCT entry must be entered as shown in the `rtrv-pct` output. If dashes are shown in a field or column, the field or column has no value and the parameter that corresponds to that field or column cannot be specified with the `dlt-pct` command.

1. Display the PCT entries by entering the `rtrv-pct` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0

    EPCA             FILTPCA          REALPCA      SI  SSN  RELCAUSE
    001-001-001      *                002-002-002   5  ---   10

    ECICS = 10          ECICE = 20
    RCICS = 30          RCICE = 40

    EPCI             FILTPCI          REALPCI      SI  SSN  RELCAUSE
    1-001-2          2-002-2          2-002-2       3   10  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------

    EPCN             FILTPCN          REALPCN      SI  SSN  RELCAUSE
    00300            *                00200         *  ---  ---

    ECICS = ----------  ECICE = ----------
    RCICS = ----------  RCICE = ----------


 Unique EPC    is 3 of 250
 Unique RealPC is 3 of 250

PCT table is (3 of 1000) 1% full.
```

If no entries are shown in the `rtrv-pct` output, this procedure cannot be performed.

If entries are shown in the `rtrv-pct` output, continue the procedure with 2.

2. Remove the PCT entry from the database using the `dlt-pct` command with the values shown in the columns and fields of the PCT entry, shown in 1, that is being removed. For this example, enter this command.

   `dlt-pct:epca=001-001-001:realpca=002-002-002:filtpca=*:si=5:ecics=10:ecice=20:rcics=30:rcice=40`

   When the `dlt-pct` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 10-12-17 15:35:05 GMT EAGLE5 43.0.0
   DLT-PCT: MASP A - COMPLTD
   ```

3. Verify the changes using the `rtrv-pct` command with the parameters and values specified in 2. For this example, enter this command.

   `rtrv-pct:epca=001-001-001:realpca=002-002-002:filtpca=*:si=5:ecics=10:ecice=20:rcics=30:rcice=40`

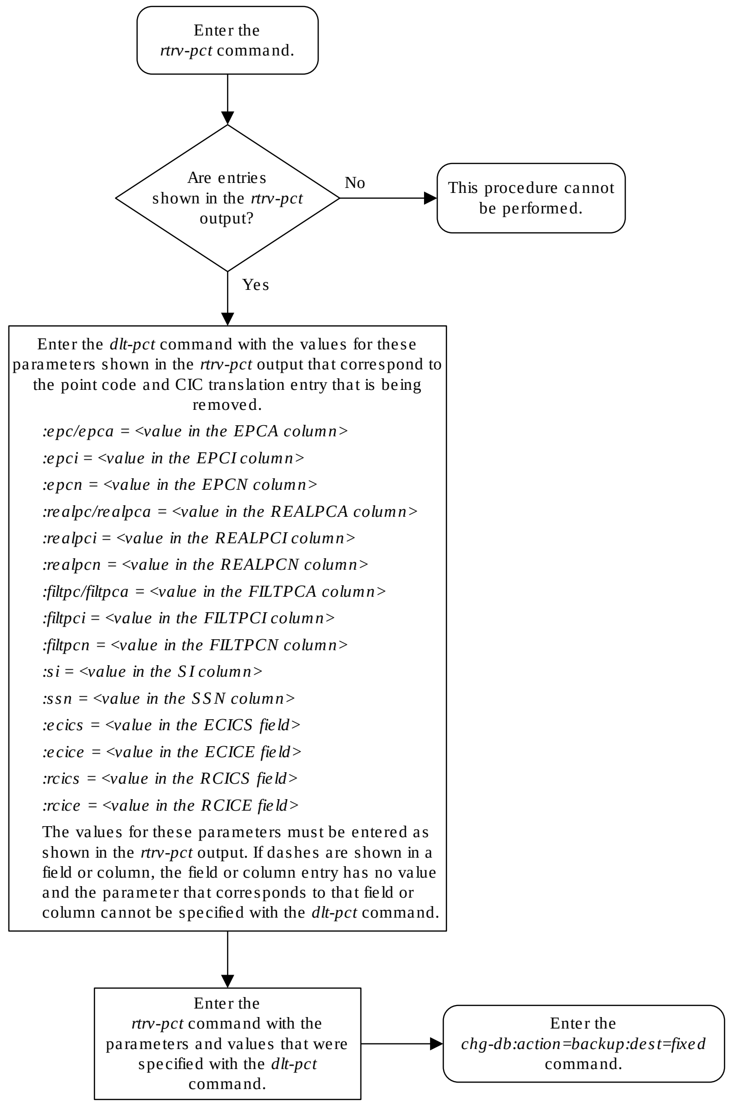
   This message should appear.

   ```
   E5401 Cmd Rej: Single translation entry not found
   ```

4. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command. These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

   ```
   BACKUP (FIXED) : MASP A - Backup starts on active MASP.
   BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
   BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
   BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
   ```

Figure 4-3 Removing a Point Code and CIC Translation Entry



4.5 Configuring the Point Code and CIC Translation STP Option

This procedure is used to configure the STP option for the PCT (Point Code and CIC Translation) feature using the `chg-stpopts` command with the `pct` parameter. The `pct` parameter has three values.

- on – The PCT feature is applied to all MSUs.
- off – The PCT feature is not applied to any MSUs.
- lset – The PCT feature is applied to incoming MSUs or outgoing MSUs on a linkset whose PCT option value is on.

The default value for the pct parameter is off.

The value of the pct parameter is shown in the PCT field of the rtrv-stpopts output. The PCT field of the rtrv-stpopts is shown only if a PCT quantity is enabled.

1. Display the features that are enabled by entering the rtrv-ctrl-featcommand.

   The following is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   If a PCT quantity is not enabled, perform the Changing the Point Code and CIC Translation Quantity procedure to enable a PCT quantity. The value of the PCT field in the rtrv-stpopts output is set to the default value off. After the Changing the Point Code and CIC Translation Quantity procedure has been performed, continue the procedure with 3.

   If a PCT quantity is enabled, continue the procedure with 2.

2. Display the existing value for the pct parameter by entering the rtrv-stpopts command. This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
STP OPTIONS
---------------------------
PCT                    off
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in the*Commands Manual*.

3. Change the value of the `pct` parameter. Enter one of these commands.
   a. To change the `pct` parameter value to `off`, enter this command.
      `chg-stpopts:pct=off`
   b. To change the `pct` parameter value to `on`, enter this command.
      `chg-stpopts:pct=on`
   c. To change the `pct` parameter value to `lset`, enter this command.
      `chg-stpopts:pct=lset`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

4. Verify the changes using the `rtrv-stpopts` command. This is an example of the possible output.

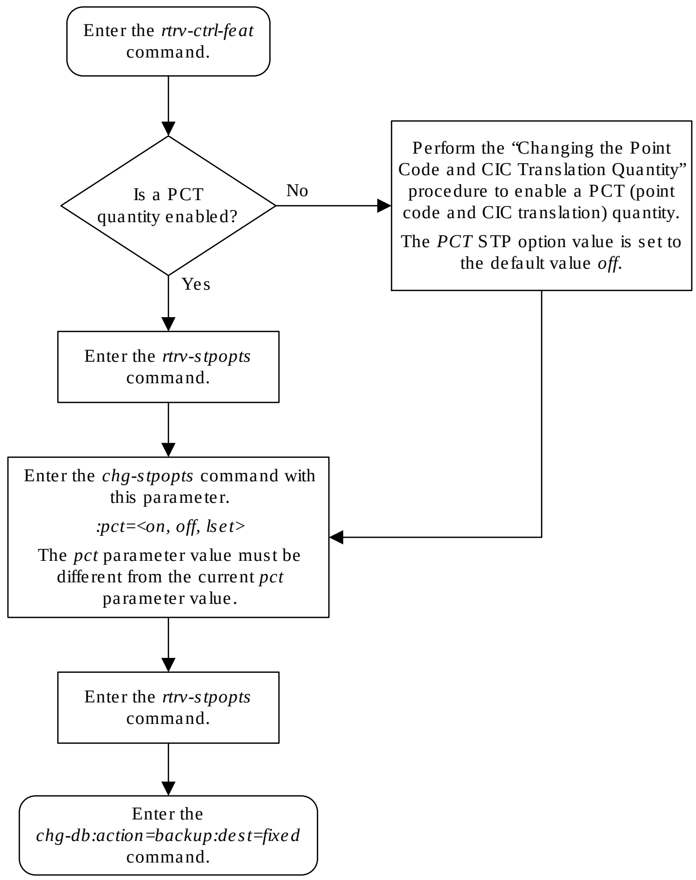
```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
STP OPTIONS
---------------------------
PCT                    lset
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in the *Commands Manual*.

5. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 4-4   Configuring the Point Code and CIC Translation STP Option



4.6 Configuring the Point Code and CIC Translation Linkset Option

This procedure is used to configure the PCT (point code and CIC translation) option for a linkset using the `chg-lsopts` command with the `pct` and `lsn` parameters.

The `pct` parameter has two values.

- `on` – The PCT feature is applied to incoming MSUs or outgoing MSUs on a linkset.
- `off` – The PCT feature is not applied to incoming MSUs or outgoing MSUs on a linkset.

The default value for the `pct` parameter is `off`.

The `lsn` parameter value is the name of the linkset that is being changed. The `lsn` value is shown in the `LSN` column of the `rtrv-ls` output.

The value of the `pct` parameter of the linkset can be changed only if a PCT quantity is enabled. The `pct` parameter value the linkset will effect the linkset's traffic only if the `PCT` value in the `rtrv-stpopts` output is `lset`. The `PCT` field of the `rtrv-stpopts` is shown only if a PCT quantity is enabled.

The value of the `pct` parameter of the linkset is shown when an individual linkset is displayed by entering the `rtrv-ls:lsn=<linkset name>` command. The `pct` parameter value is shown in the `PCT` column.

Canceling the `RTRV-LS` Command

Because the `rtrv-ls` command used in this procedure can output information for a long period of time, the `rtrv-ls` command can be canceled and the output to the terminal stopped. There are three ways that the `rtrv-ls` command can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rtrv-ls` command was entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rtrv-ls` command was entered, from another terminal other that the terminal where the `rtrv-ls` command was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands Manual*.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat`command.

   The following is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
```

```
The following features have been permanently enabled:

Feature Name                 Partnum    Status  Quantity
Command Class Management     893005801  on      ----
LNP Short Message Service    893006601  on      ----
Intermed GTT Load Sharing    893006901  on      ----
XGTT Table Expansion         893006101  on      4000000
XMAP Table Expansion         893007710  on      3000
Large System # Links         893005901  on      1500
Routesets                    893006401  on      6000
HC-MIM SLK Capacity          893012707  on      64

The following features have been temporarily enabled:

Feature Name                 Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name                 Partnum
Zero entries found.
```

If a PCT quantity is not enabled, perform the Changing the Point Code and CIC Translation Quantity procedure to enable a PCT quantity. The `PCT` value for all linksets is set to the default value `off` and the value of the `PCT` field in the `rtrv-stpopts` output is set to the default value `off`. After the Changing the Point Code and CIC Translation Quantity procedure has been performed, continue the procedure with 2.

If a PCT quantity is enabled, continue the procedure with 2.

2. Display the linksets in the database by entering the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0
                                 L3T SLT              GWS GWS GWS
LSN           APCA     (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2          001-207-000   none  1   1   no  B   6    off off off no
off
ls05          002-009-003   scr2  1   1   no  C   4    on  off on  no
off
ls1305        000-005-000   none  1   1   no  A   1    off off off no
off
ls1307        000-007-000   none  1   1   no  A   1    off off off no
off
e1m1s1        001-001-001   none  1   1   no  A   7    off off off no
off
e1m1s2        001-001-002   none  1   1   no  A   7    off off off no
off

                                 L3T SLT              GWS GWS GWS
LSN           APCI     (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
e1e2i         1-207-0       none  1   1   no  B   4    off off off ---    on
```

```
ls1315       0-015-0       none  1   1   no  A   1    off off off
---   off
ls1317       0-017-0       none  1   1   no  A   1    off off off
---   on
e1m2s1       1-011-1       none  1   1   no  A   7    off off off
---   off
e1m2s2       1-011-2       none  1   1   no  A   7    off off off
---   off

Link set table is (11 of 1024) 1% full.
```

3. Display the attributes of the linkset that is being changed by entering the `rtrv-ls` command with the name of the linkset shown in 2. For this example, enter these commands.

   `rtrv-ls:lsn=ls05`

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 11:43:04 GMT EAGLE5 43.0.0

                               L3T SLT              GWS GWS GWS
LSN           APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ls05          002-009-003    scr2 1   1   no  C   4    on  off on
no    off

              SPCA           CLLI          TFATCABMLQ MTPRSE ASL8
           ---------------- -----------    2          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD     PCT
           no    no       CdPA                no        off

                                L2T               PCR   PCR
          LOC   LINK  SLC TYPE      SET  BPS     ECM    N1    N2
          1205  b     0   LIMDS0    1    56000   BASIC ---   -----
          1213  b     1   LIMDS0    1    56000   BASIC ---   -----
          1211  a     2   LIMDS0    1    56000   BASIC ---   -----
          1207  b     3   LIMDS0    1    56000   BASIC ---   -----

Link set table is ( 24 of 1024)  2% full
```

4. Change the `PCT` value of the linkset by entering one of these commands. The new `PCT` value of the linkset must be different from the current value.

   a. To change the `pct` parameter value to `off`, enter this command.

      `chg-lsopts:lsn=ls05:pct=off`

   b. To change the `pct` parameter value to `on`, enter this command.

      `chg-lsopts:lsn=ls05:pct=on`

When this command has successfully completed, this message should appear.

```
rlghncxa03w 10-12-07 00:22:57 GMT  EAGLE5 43.0.0
Link set table is (24 of 1024) 2% full.
CHG-LSOPTS: MASP A - COMPLTD
```

5. Verify the changes by entering the `rtrv-ls` command with the name of the linkset that was specified in 4. For this example, enter this command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-17 11:43:04 GMT EAGLE5 43.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ls05          002-009-003   scr2 1   1   no  C   4    on  off on  no
off

              SPCA          CLLI          TFATCABMLQ MTPRSE ASL8
           ---------------- -----------   2          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE          CGGTMOD    PCT
           no    no       CdPA               no       on

                                  L2T             PCR  PCR
          LOC   LINK SLC TYPE     SET  BPS    ECM   N1   N2
          1205  b    0   LIMDS0   1    56000  BASIC ---  -----
          1213  b    1   LIMDS0   1    56000  BASIC ---  -----
          1211  a    2   LIMDS0   1    56000  BASIC ---  -----
          1207  b    3   LIMDS0   1    56000  BASIC ---  -----

Link set table is ( 24 of 1024)  2% full
```

   The `PCT` value of the linkset will have no effect on the linkset's traffic unless the `PCT` value shown in the `rtrv-stpopts` output (6) is `lset`.

6. Display the existing value for the `pct` parameter by entering the `rtrv-stpopts` command. This is an example of the possible output.

```
rlghncxa03w 10-12-17 16:02:05 GMT  EAGLE5 43.0.0
STP OPTIONS
---------------------------
PCT                     lset
```

> **Note:**
>
> The `rtrv-stpopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in the *Commands Manual*.

If the `PCT` value is is `lset`, continue the procedure with 7.

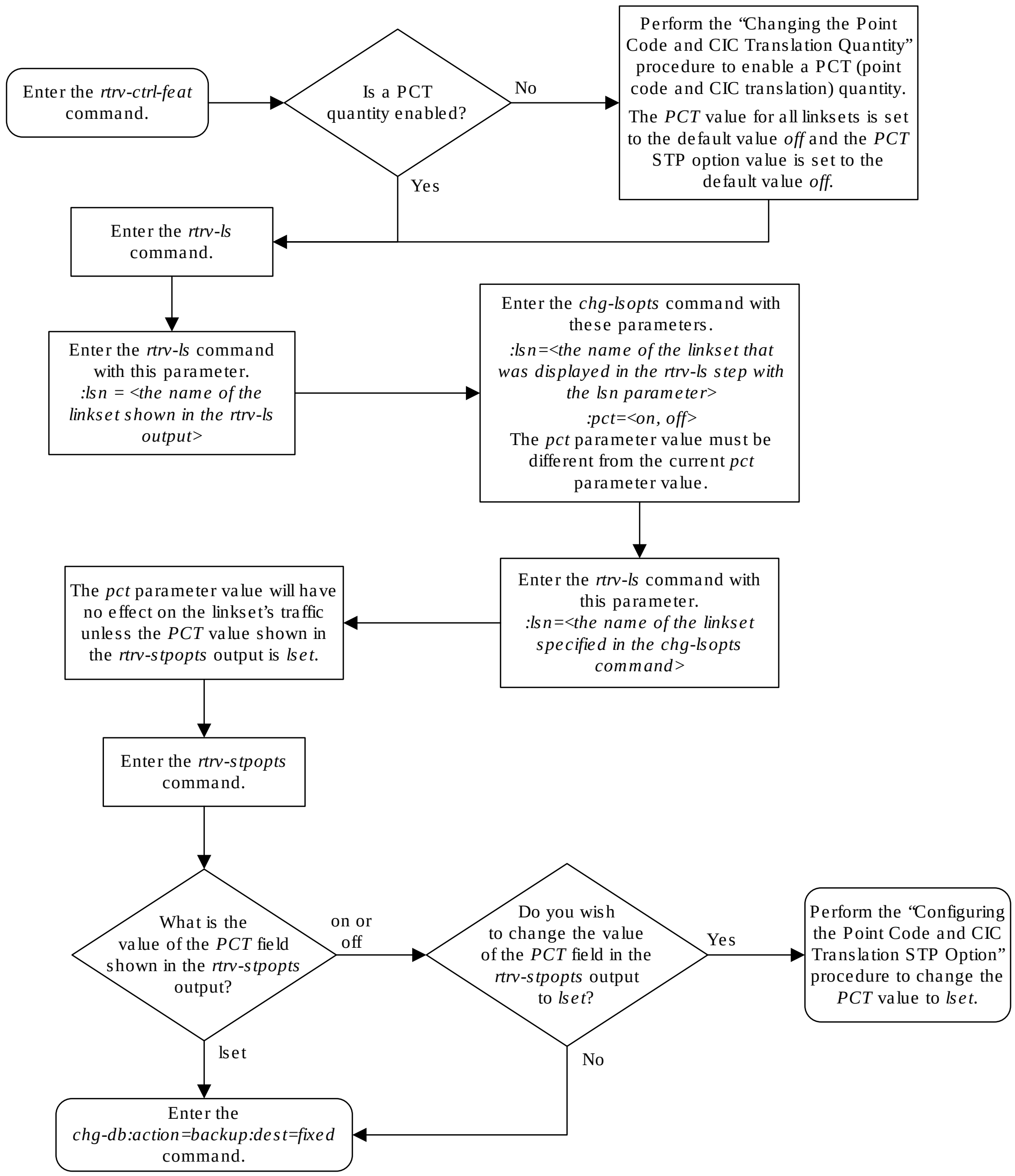
If the `PCT` value is either `on` or `off`, perform one of these actions.

- If you wish to change the `PCT` value to `lset`, perform the Configuring the Point Code and CIC Translation STP Option procedure. This procedure is finished.
- If you do not wish to change the `PCT` value to `lset`, continue the procedure with 7

7. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure 4-5 Configuring the Point Code and CIC Translation Linkset Option



A
E1 Interface

Appendix A, E1 Interface, contains general information about the E1 interface and how to provision it.

A.1 Introduction

The **E1** interface terminates or distributes **E1** facility signals for the purpose of processing the **SS7** signaling links carried by the **E1** carrier. The **E1** interface can be either a an **E1**/**T1 MIM** card, an **E5-E1T1-B** card, or SLIC card as shown in Figure A-1, and Figure A-2. The **E1**/**T1 MIM** or **E5-E1T1-B** card can also be used as a **T1** interface. This appendix describes how an **E1** interface is configured using either the the **E1**/**T1 MIM** card or **E5-E1T1-B** card. The **T1** interface configuration is described in T1 Interface.

> **Note:**
>
> The procedures in this appendix are used only to configure **E1** signaling links on the **E1**/**T1MIM** card or **E5-E1T1-B** card. To configure an **E1** high-speed signaling link (on the **LIME1ATM** card), go to the Adding an ATM High-Speed Signaling Link procedure.

The **E1**/**T1 MIM** card contains up to eight signaling links and allows the **EAGLE** to contain more than 500 signaling links.

Figure A-1 E1/T1 MIM Block Diagram

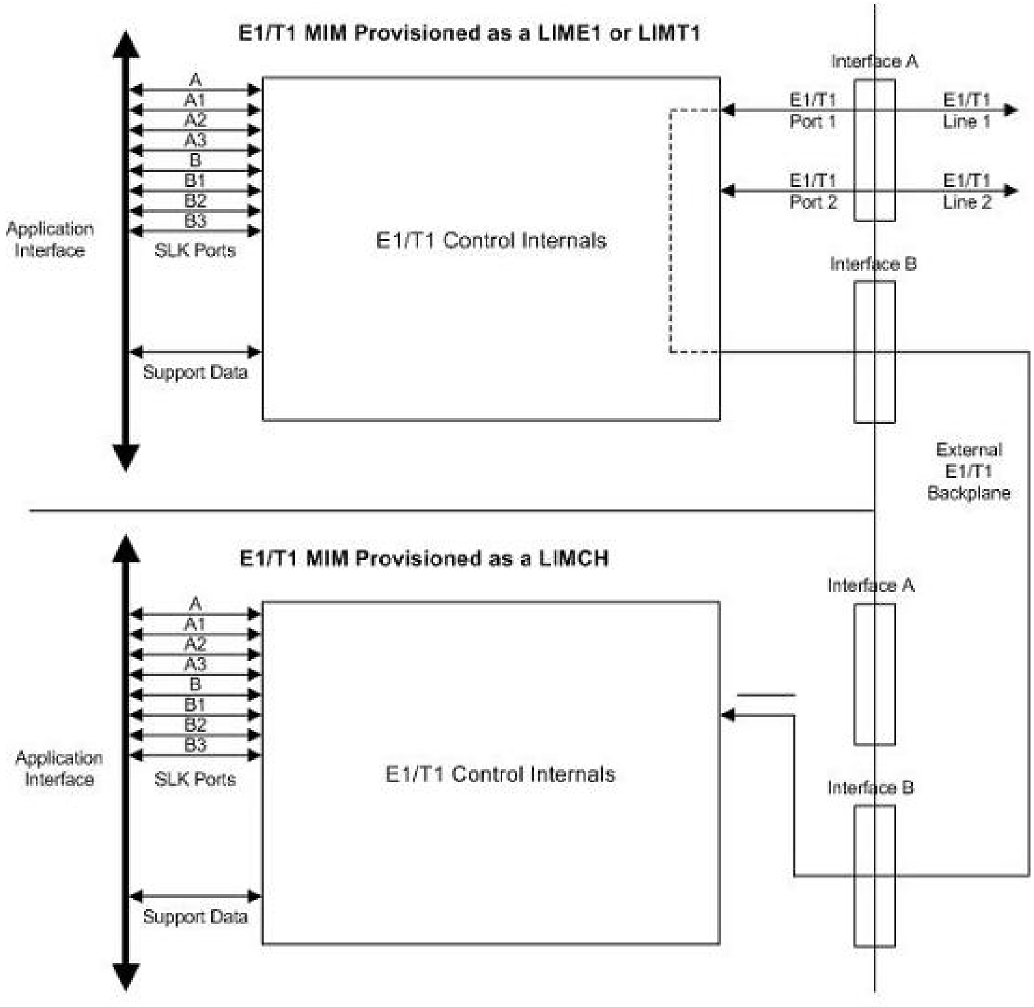


Figure A-2 E5-E1T1-B Block Diagram

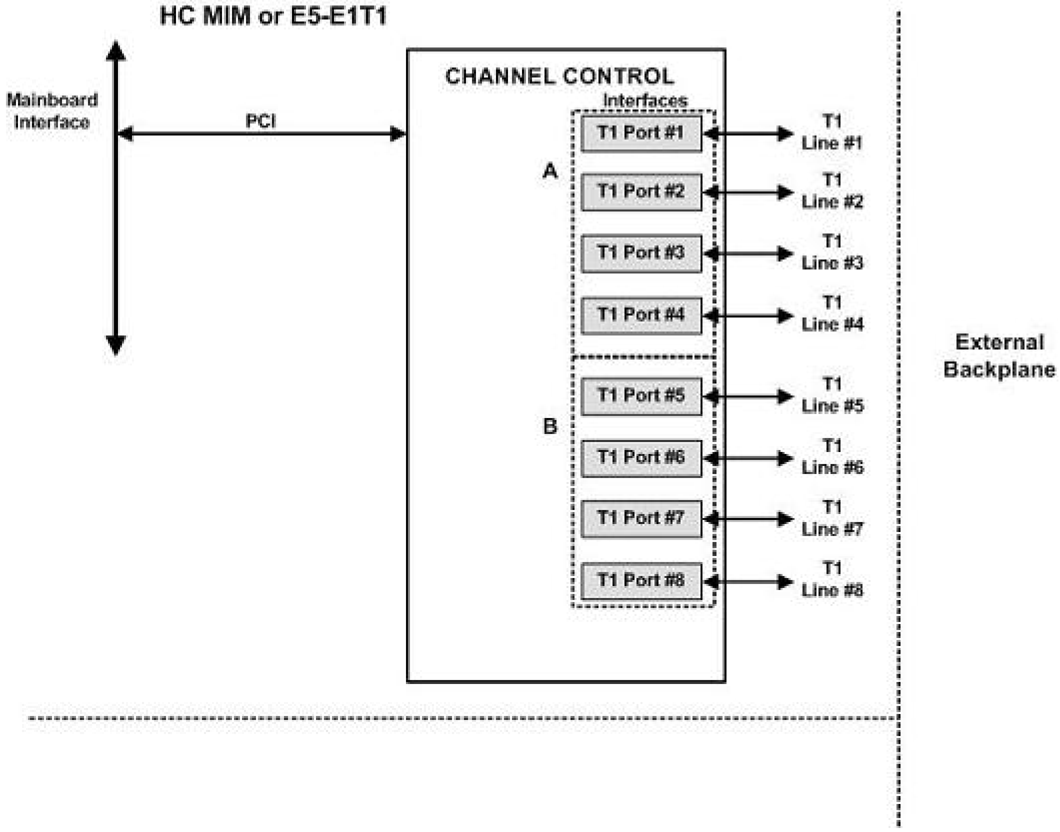


Table A-1 provides an overview of the functions of the **E1** card and the channel card.

Table A-1 Functional Overview of the E1 and Channel Card

Card	Function
E1	• Connectivity of both **E1** interfaces to a 120 Ohm or 75 Ohm **E1** interface. An external adapter is required for the 75 Ohm interface. • Processing up to a total of eight (only two if an E1T1 MIM is being used) time slots from the **E1** interfaces • Interface **E1** port 1 through an external backplane to channel cards for processing of additional time slots
Channel	• Processing up to eight (only two if an E1T1 MIM configured as a channel card is being used) time slots from the **E1** interface • Interface through an external backplane to an **E1** card to process up to eight (only two if an E1T1 MIM configured as a channel card is being used) time slots

Configured as an E1 Card

Configured as an **E1** card, two separate and independent **E1** inputs can be terminated on an **E1** card. If an **E1**/**T1 MIM** is being used, one to eight bi-directional channels are extracted from the **E1** inputs and processed as **SS7** signaling links. Implemented as **E1 Link** Interface Modules, up to thirty two separate and independent **E1** inputs can be terminated in an **Extension Shelf**. The **E1** card can support signaling links transmitting at either 56 kbps or 64 kbps.

Configured as a Channel Card

In an Extension shelf equipped with an **E1** cabling backplane, an **E1** card terminates one or two **E1** inputs and connects the **E1** port 1 input to one of eight available busses on the **E1** cabling backplane. **Channel** cards also connected to the **E1** cabling backplane are able to extract any eight signaling channels from the same **E1** port 1 input. In this manner, up to 31 **E1** channels can be used for signaling - the 32nd channel is reserved for **E1** synchronization. The **E1** card can support signaling links transmitting at either 56 kbps or 64 kbps.

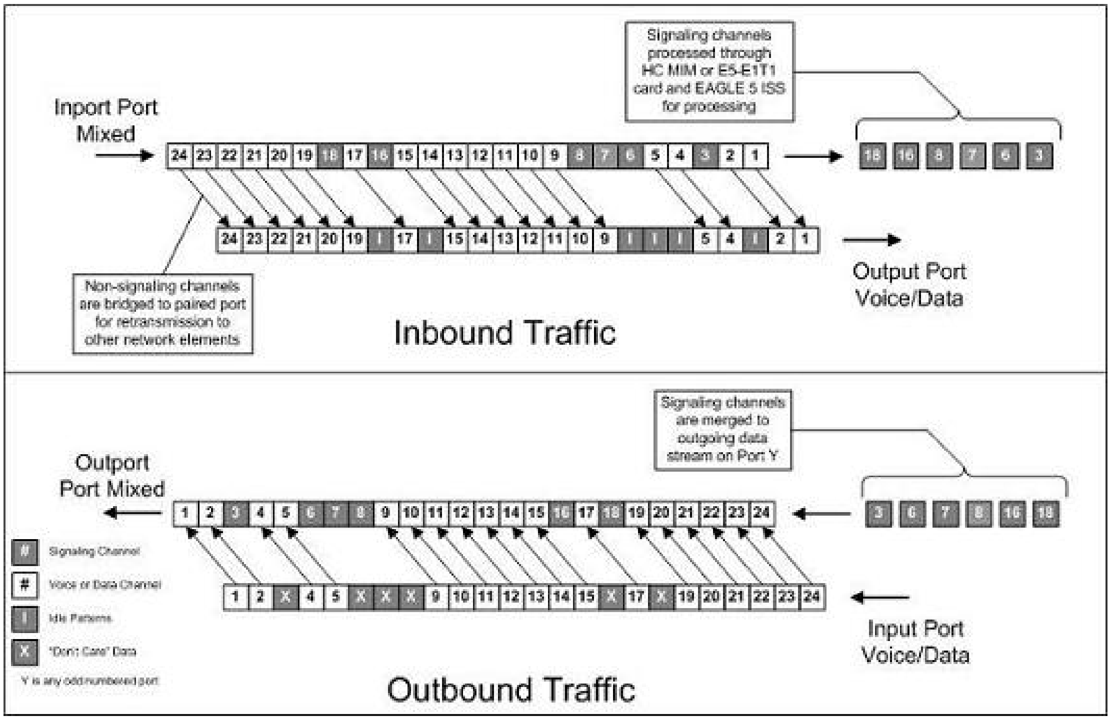
> **Note:**
>
> An E5-E1T1-B card cannot be used as a channel card.

High Capacity Multi-Channel Interface Module (HC-MIM) and Eagle 5 - E1 T1 Interface (E5-E1T1)

The EAGLE 5 - **E1 T1-B** Interface (**E5-E1T1-B**) provides access to eight **E1** ports residing on backplane connectors A and B. Each data stream consists of 31 **E1 DS0** signaling links assigned in a time-division multiplex manner. Each channel occupies a unique timeslot in the data stream and can be selected as a local signaling link on the interface card. A maximum of 64 **E1** signaling links can be assigned to an appropriate card. A maximum of 32 **E1** signaling links can be assigned to an **E5-E1T1-B** card.

To support the processing of signaling channels that are intermixed on trunks with voice or data channels, the **E5-E1T1-B** card allows **E1** ports to be channel bridged. This allows better utilization of **E1** bandwidth without dedicating entire trunks to signaling.

Figure A-3 Channel Bridging



Channel bridging is implemented by pairing odd and even **E1** ports. The **E1** port selected for channel bridging is the odd numbered port (1, 3, 5, 7). When the **E1** port is selected for channel bridging, it is paired with its adjacent even numbered port (2, 4, 6, 8) as shown in Table A-2.

Table A-2 Channel Bridging E1 Port Pairing

Odd Numbered E1 Port (Bridging Master)	Even Numbered E1 Port Bridged to the Odd Numbered E1 Port (Bridging Slave)
1	2
3	4
5	6
7	8

By pairing **E1** ports, the adjacent even numbered **E1** port could be used to allow data received on the bridging master (odd) **E1** port to reach downstream network elements. This interface is a bi-directional interface so data is also able to enter the bridging slave (even) **E1** port and leave the **EAGLE** through the bridging master (odd) **E1** port. There is a 1 to 1 correspondence between the timeslots on the bridging master and slave **E1** ports.

In order to use channel bridging without facility errors, both **E1** ports (bridging master and slave) must be synchronous (timed off the same clock source). This may be accomplished in one of the following ways:

- The bridging master **E1** port and the bridging slave **E1** port use timing recovered from each other (using the `e1tsel=recovered` parameter with either the `ent-e1` or `chg-e1` command). When provisioning channel bridged **E1** port, only the bridging master **E1** port is provisioned with the `ent-e1` or `chg-e1` command. The bridging slave **E1** port is automatically provisioned with the same attributes as the bridging master **E1** port.

- Both the bridging master and slave **E1** ports are using an external clock source (using the `e1tsel=external` parameter when provisioning the channel bridged **E1** port with either the `ent-e1` or `chg-e1` command).

Any other methods used for timing could cause problems on the **E1** trunk and are not supported.

Idle patterns on the shadow channels, that is, the timeslots located on the bridging slave **E1** port that have been not been dropped from the bridging master **E1** port, are provided by the **EAGLE**. All other idle timeslots that are not dropped by the **EAGLE** must contain an idle pattern provided by the remote network elements connected to both **E1** ports (bridging master and slave). Without these patterns on the idle timeslots, instability of the **E1** signaling link may occur.

Provisioning of signaling links on the bridging slave **E1** port is not allowed while the bridging master **E1** port is channel bridged.

A.2 Determining the Configuration

External Interface Descriptions

The **E1** Interface Backplane provides a method for extending individual **E1** channels from the **E1**-configured cards to any channel-configured cards in use. Note the following issues regarding the E1 backplane:

- Only one **E1**-configured card may be plugged into each bus on the backplane.
- When installing non-**E1** cards on the shelf equipped with the **E1** interface backplane, ensure that none of the slots to be used are cabled to the **E1** interface backplane. If a non-**E1** card is installed in a slot that is connected to the **E1** backplane, all **E1** cards on that bus may fail.
- Only one **E1** card may be connected (via the B port) to each bus of the **E1** cabling backplane, and all **SS7** links derived from any particular **E1** must be processed on the same shelf on which the incoming **E1** is terminated.
- Due to cable congestion, Oracle does not recommend use of the **E1** cabling backplane on the control shelf.
- If the control shelf is used, a maximum of 20 **E1** interfaces can be utilized in the control shelf.

The **E1** backplane is impedance-controlled for 120 Ohms and is designed for use with **RS**-485 transmission characteristics.

Descriptions of the **T1** hardware and the procedures for installing the **T1** hardware are contained in *Hardware Reference* and *Installation Guide*.

Possible Configurations

The **E1** backplane was designed to allow the maximum number of possible customer setups. It allows the customer to choose between several levels of diversity and convenience. Configurations depend on the number of cards configured as **E1** cards versus the number of cards configured as channel cards. The level of diversity required by the customer also affects the configuration requirements. Note that all signals labelled "**E1** input" may be one or two **E1** ports depending on the cable used.

Support of Two E1 Ports

The **E1** card will support two **E1** ports, which are independently configurable. On an **E1** card, **E1** port 1 will support channel cards. The second port of that **E1** card will only support up to a maximum of eight time slots and will not support channel cards.

Clocking Options

Each **E1** interface must independently operate in one of two clocking modes. When configured as a channel card, an **E1** card is required for the channel card's clocking source.

- Slave Timing - The default receive clock on the **E1** card will be used as the source of the transmit clock.
- Master Timing **-** The transmit clock of the **E1** card will originate on this board. The oscillator on the board provides the clock source. *Note the oscillator is less accurate than the network clock*.

The Master Timing feature allows an **E1** signaling link to take its high-speed clock reference directly from an external high-speed master clock source.

Support of E1 Framing Options

The **E1** interfaces will independently support the following **E1** framing options. Selection of these options will be made by the `crc4` and `cas` parameters of either the `ent-e1` or `chg-e1` commands.

- Clear **Channel** Signaling (**CCS**)
- **Channel** Associated Signaling (**CAS**)
- **Cyclic Redundancy Check** (**CRC4**)

The following provide for zero bit suppression: **HDB**3 (High Density Bipolar encoding of order 3).

On any given **E1** card, **CCS** and **CAS** are mutually exclusive and cannot be used together. However, **CRC4** may be added to either **CCS** or **CAS**.

LIM-E1 Card to Channel Card Interface

Whether the **E1**/channel card is operating as an **E1** card or a channel card, the card will map any eight channels from the **E1** interfaces to an **HDLC** controller (ports A, B, A1, B1, A2, B2, A3, B3 for the **E1**/**T1 MIM** card). These channels could be dropped either both from **E1** port 1 or one from **E1** port 1 and the other from **E1** port 2. When the **E1**/channel card is configured as an **E1** card, it will support the external **E1** cabling backplane interface from **E1** port 1 *(***E1** *port 2 will not have this capability)* to additional **E1**/channel cards, within the same shelf, configured as channel cards. Idle time slots not assigned to an **E1** card or a channel card will be filled with a one's pattern.

Channel Support

The **E1**/channel card will independently support either 56 kbps or 64 kbps on any channel.

Configuring the Signaling Links

The main consideration for the provisioning of E1s is to determine the number of E1s existing in the network and the equipment needed for grooming into the **EAGLE**. To utilize the flexibility of the **E1** interface feature, you may want to determine the minimum number of **E1** cards needed to process the total number of **SS7** links and then consider diversity for reliability reasons.

Use the following points as guidelines when considering diversity for **E1**:

- If possible, no two E1s containing links from a common link set should be on the same **E1**/dual port channel card.
- If possible, no two E1s containing links from a common link set should be on adjacent **E1**/dual port channel cards where they are powered from the same fuse position.
- If possible, no two E1s containing links from a common link set should be terminated on the same shelf because of the shelf clock cabling, and is only an issue if using master clocking sync to the network
- If possible, no two links in a link set should arrive at the **EAGLE** on the same **E1**.
- If possible, for link sets containing more than two links, you should minimize the number of links in that link set on any given **E1**.

As an example, consider a network to be groomed into the **EAGLE** consisting of 30 E1s with a total number of 100 links where the largest link set size is 8. The most efficient way to provision the **EAGLE** would be to have four extension shelves equipped with the **E1** cabling backplane, one **E1** card, and 12 channel cards per shelf. Utilizing one B bus on each shelf, 25 signaling links would be terminated on each shelf for a total of 100. *This is also the minimum number of* **E1** *cards required for this example.*

With the same example but using the third and fifth bullets above as a consideration, the **EAGLE** would be provisioned with eight extension shelves equipped with the **E1** cabling backplane. Four of the shelves would be equipped with one **E1** card and six channel cards, and the other four shelves would be equipped with one **E1** card and five channel cards. *Since the largest link set size is eight, a total of eight* **E1** *cards is required.* Utilizing one B bus on each shelf, 13 signaling links would be terminated on each shelf with six channel cards, and 12 signaling links would be terminated on each shelf with five channel cards.

> **Note:**
>
> When retrieving link information from the database, the links for an **E1** or channel card is not displayed until after the card is allowed.

E1 Configuration Form

Use the form provided below to record your **E1** configuration. An example of the required input is shown in italics under each column heading.

Table A-3 E1 Signaling Link Configuration Form

Card Location and Port (*1201 A*)	Timeslot (*1*)	E1 Number (*1*)	E1 Card Location (*1201*)	Adjacent Point Code (*4001*)	Linkset (ST1ME)	SLC (*1*)

Table A-3 (Cont.) E1 Signaling Link Configuration Form

Card Location and Port (*1201 A*)	Timeslot (*1*)	E1 Number (*1*)	E1 Card Location (*1201*)	Adjacent Point Code (*4001*)	Linkset (ST1ME)	SLC (*1*)

A.3 E1 Interface Configuration Procedures

This appendix contains these procedures because they contain information specific to the **E1** Interface:

- Adding a LIM-E1 Card
- Removing a LIM-E1 Card
- Adding Channelized and non-Channel Bridged E1 Ports
- Adding Channel Bridged E1 Ports
- Adding Unchannelized E1 Ports
- Removing the E1 Interface Parameters
- Changing the Attributes of a Channelized E1 Port
- Changing the Attributes of an Unchannelized E1 Port
- Making a Channel Bridged E1 Port from a Channelized E1 Port

- Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port
- Adding an E1 Signaling Link

Procedures for configuring the linksets and routes, for removing **SS7** signaling links (which includes **E1** signaling links), and for configuring the **HC MIM** temperature alarms are contained in SS7 Configuration interface, therefore, are not included in this appendix.

The procedures contained in this appendix use a variety of commands. If more information on these commands is needed, go to *Commands User's Guide* to find the required information.

A.4 Adding a LIM-E1 Card

The **LIM**-El card is provisioned as either an **E1** card or a channel card in the database using the `ent-card` command. The card being provisioned in the database can be one of these cards shown in Table A-4.

Table A-4 E1 Card Part Numbers

Card Type	Part Number
E1/T1MIM	870-2198-**XX**
E5-E1T1	870-1873-**XX**

The `ent-card` command uses these parameters.

`:loc` – The location of the card being added to the database.

> **Note:**
>
> The **HC-MIM** can be inserted only in a odd-numbered card location. The **HC-MIM** will not power up if it is inserted in an even-numbered card location. All the **E1** backplane cabling should be removed from the B connector for the slot that the **HC-MIM** will occupy.
> The **HC-MIM** occupies two card locations, so the even numbered card location adjacent to the odd numbered slot where the **HC-MIM** has been inserted must be empty, as shown in Table A-5. The **HC-MIM** is connected to the network through the odd numbered card slot connector.

Table A-5 HC-MIM Card Locations

Location of the HC-MIM	Empty Card Location	Location of the HC-MIM	Empty Card Location
Slot 01	Slot 02	Slot 11	Slot 12
Slot 03	Slot 04	Slot 13	Slot 14
Slot 05	Slot 06	Slot 15	Slot 16
Slot 07	Slot 08	Slot 17	Slot 18

The **E1**, **E1/T1 MIM** and **E5-E1T1** cards occupy one card location. These cards can be placed in any card location except for even numbered card locations whose adjacent odd numbered card location is occupied by a card that occupies two card locations.

`:type` – The type of card being added to the database. For this procedure, the value of this parameter is `lime1` (**E1** card) or `limch` (channel card).

> **Note:**
>
> The **HC-MIM** and **E5-E1T1** card cannot be provisioned as a channel card.

`:appl` – The application software that is assigned to the card. For this procedure, the value of this parameter is either `ccs7itu` or `ss7ansi`.

The shelf to which the card is to be added must already be in the database. This can be verified with the `rtrv-shlf` command. If the shelf is not in the database, see the Adding a Shelf procedure in *Database Administration - System Management User's Guide*.

The examples in this procedure are used to add the **LIM-E1** cards in card locations 1201, 1202, 1203, 1204, 1211, and 1212 to the database.

1. Display the cards in the **EAGLE** using the `rtrv-card` command.

   ```
   rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
   CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
   1102   TSM       GLS
   1113   GSPM      OAM
   1114   TDM-A
   1115   GSPM      OAM
   1116   TDM-B
   1117   MDAL
   ```

   The cards should be distributed throughout the **EAGLE** for proper power distribution. Refer to *Installation Guide* for the shelf power distribution.

2. Verify that the correct hardware has been installed on the **EAGLE** to support the **E1** card as shown in *Installation Guide*.

3. Physically verify that the **E1** card has been installed into the card location that will be specified in step 6.

   If the **E1** card is an **HC-MIM**, make sure the **HC-MIM** is installed according to the card location requirements shown in Table A-5. If a card is installed and provisioned in the even numbered card location adjacent to the desired odd numbered card, either choose another card location to install and provision the **HC-MIM**, or remove the card in the even-numbered card location by performing the appropriate procedure shown in Table A-6 .

   > **Note:**
   >
   > **Channel** cards must be installed in the same shelf as the **E1** card that is servicing the timeslots on those channel cards.

Table A-6 Card Removal Procedures

Card Application	Procedure
SS7ANSI, **ATMANSI**, **CCS7ITU**, **ATMITU**	“Removing an **SS7 LIM**” in Chapter 4, “System Configuration Procedures” in *Database Administration - System Management User's Guide* “Removing a **LIM-E1Card**” “Removing a **LIM-T1Card**”
VSCCP	Removing a Service Module in Chapter 2 in *Database Administration - GTT User's Guide*
GLS	Removing a GLS Card in Chapter 2, Gateway Screening (GWS) Overview, in *Database Administration - GWS User's Guide*
IPLIM, **IPLIMI**, **SS7IPGW**, **IPGWI**	"Removing an IPLIMx Card" or Removing an IPGWx Card" in *Database Administration - IP7 User's Guide*
IPSG	"Removing an IPSG Card" in *Database Administration - IP7 User's Guide*
EROUTE	“Removing an **STC** Card” in *Database Administration - Features User's Guide*
MCP	“Removing an **MCPM**” in Chapter 4, “System Configuration Procedures” in *Database Administration - System Management User's Guide*
IPS	“Removing an **IPSM**” in Chapter 4, “System Configuration Procedures” in *Database Administration - System Management User's Guide*

> **Note:**
>
> If the **E1** card being added in this procedure is not an **HC-MIM** or **E5-E1T1** card, continue the procedure with 7.

4. If the card is an EPM-B based card (E5-E1T1-B), enter the `rtrv-stpopts` command to verify whether or not the MFC option is on. If the card is not an EPM-B based card, continue the procedure with 5

   This is an example of the possible output.

```
rlghncxa03w 11-10-17 16:02:05 GMT EAGLE5 44.0.0
STP OPTIONS
---------------------------
MFC                       off
```

The `rtrv-stpopts` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

If the **MFC** option is off, perform the Configuring the MFC Option procedure in *Database Administration - System Management User's Guide* to turn on the MFC option.

If the MFC option is on or the MFC Option procedure in *Database Administration - System Management User's Guide* was performed in this step, continue the procedure with 5.

5. The Fan feature must be turned on. Enter the `rtrv-feat` command to verify that the Fan feature is on.

   If the Fan feature is on, shown in the `rtrv-feat` output in this step, the `FAN` field should be set to `on`.

   The `rtrv-feat` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 7.

   If the Fan feature is off, continue the procedure with 6.

6. Turn the Fan feature on by entering this command.

   `chg-feat:fan=on`

   > **Note:**
   >
   > Once the Fan feature is turned on with the`chg-feat` command, it cannot be turned off.

   When the `chg-feat` has successfully completed, this message appears.

   ```
   rlghncxa03w 11-10-28 11:43:04 GMT EAGLE5 44.0.0
   CHG-FEAT: MASP A - COMPLTD
   ```

7. Add the card using the `ent-card` command. If the **LIM-E1** card is an **HC-MIM**, the **HC-MIM** can be only in a odd-numbered card location, and cannot be provisioned as a channel card. The **E5-E1T1** card cannot be provisioned as a channel card. The **E1/T1MIM** and **E5-E1T1** cards occupy only one card location. These cards can be placed in any card location except for even numbered card locations whose adjacent odd numbered card location is occupied by a card that occupies two card locations.

   For this example, enter these commands.

   `ent-card:loc=1201:type=lime1:appl=ccs7itu`

   `ent-card:loc=1202:type=limch:appl=ccs7itu`

   `ent-card:loc=1203:type=lime1:appl=ccs7itu`

   `ent-card:loc=1204:type=limch:appl=ccs7itu`

   `ent-card:loc=1211:type=lime1:appl=ccs7itu`

   `ent-card:loc=1212:type=limch:appl=ccs7itu`

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-12 09:12:36 GMT  EAGLE5 36.0.0
ENT-CARD: MASP A - COMPLTD
```

8. Verify the changes using the `rtrv-card` command with the card location specified in 7 .

   For this example, enter these commands.

   `rtrv-card:loc=1201`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1201   LIME1     CCS7ITU
```

   `rtrv-card:loc=1202`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1202   LIMCH     CCS7ITU
```

   `rtrv-card:loc=1203`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1203   LIME1     CCS7ITU
```

   `rtrv-card:loc=1204`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1204   LIMCH     CCS7ITU
```

   `rtrv-card:loc=1211`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1211   LIME1     CCS7ITU
```

   `rtrv-card:loc=1212`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
```

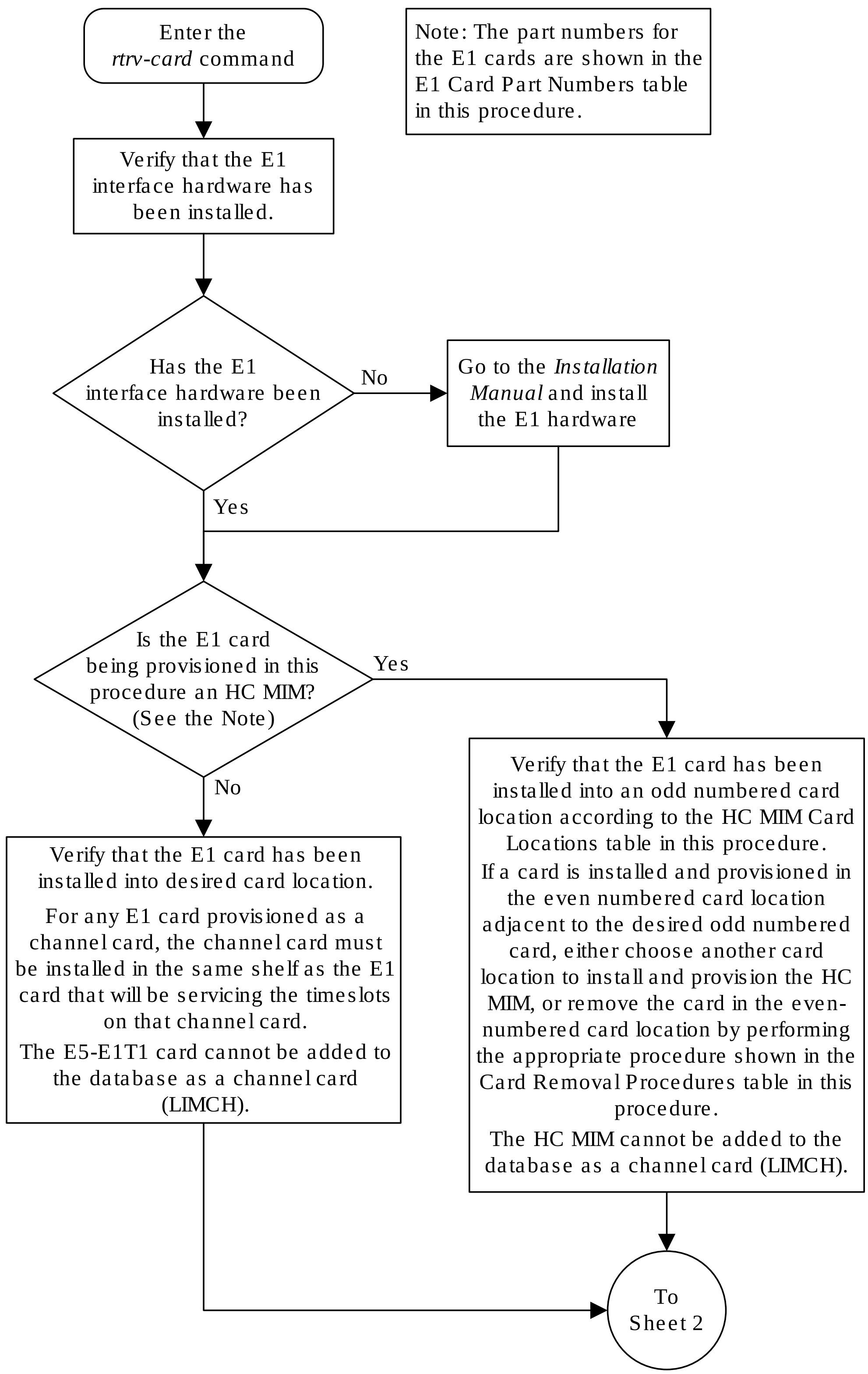
```
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1212   LIMCH     CCS7ITU
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

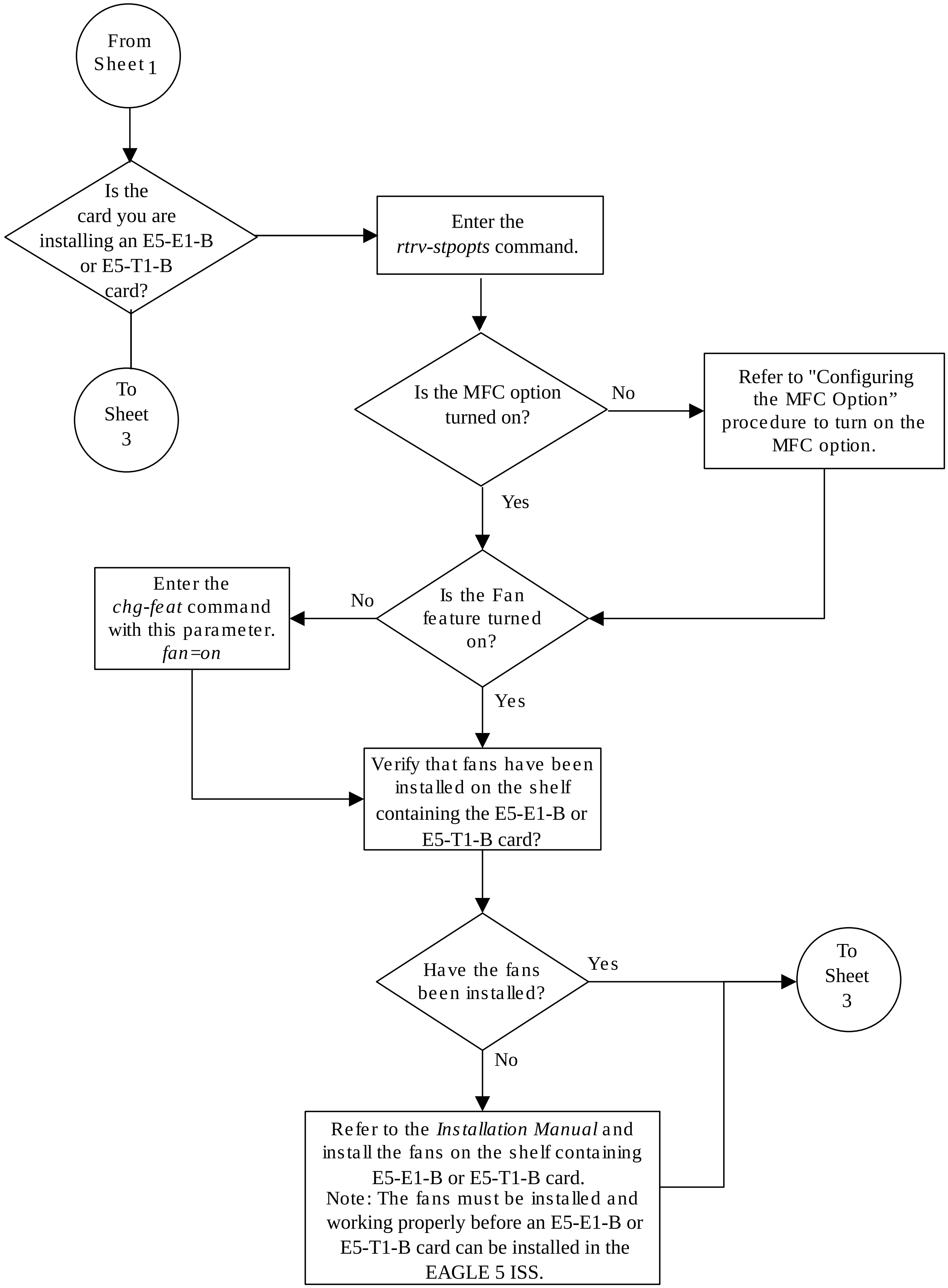
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

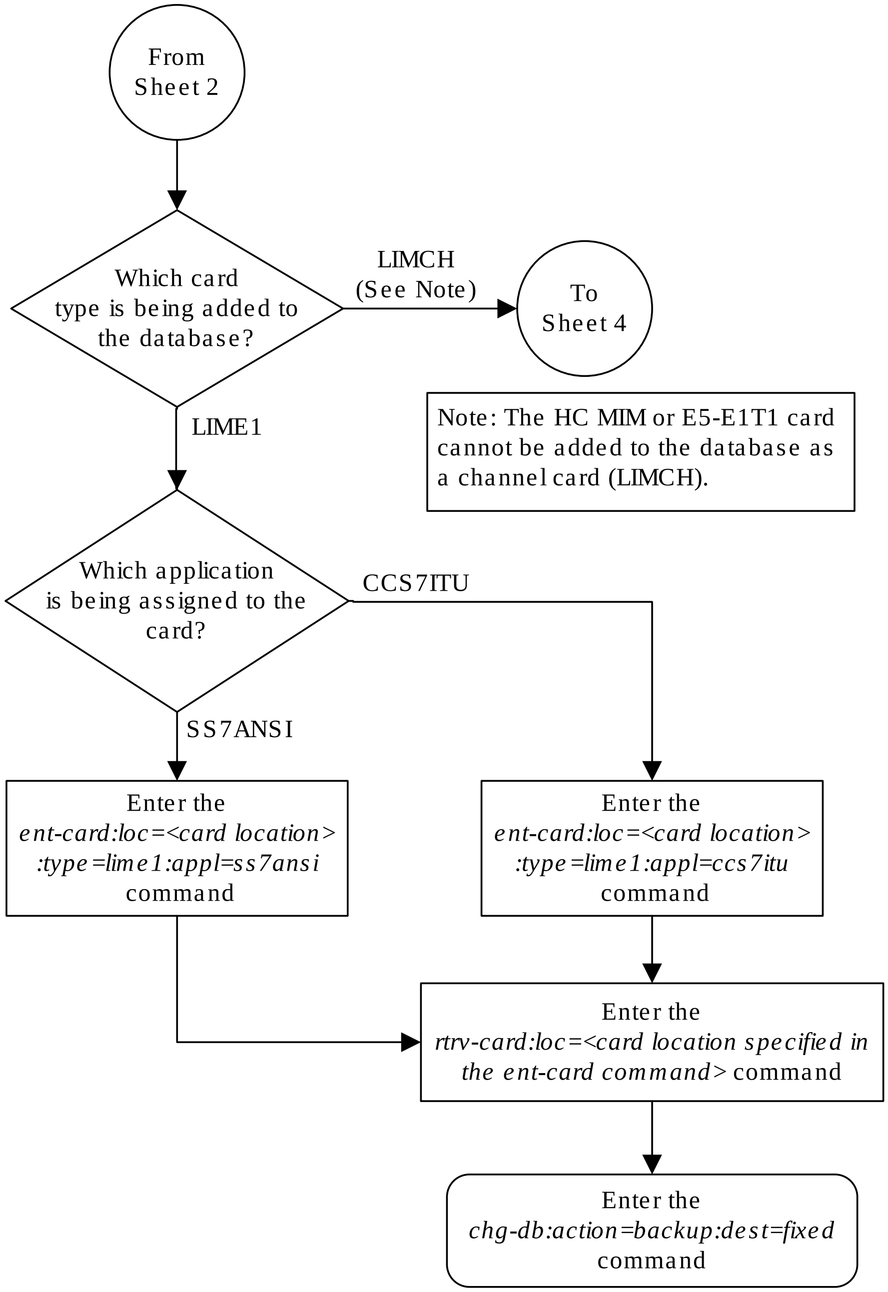
Figure A-4 Adding a LIM-E1 Card



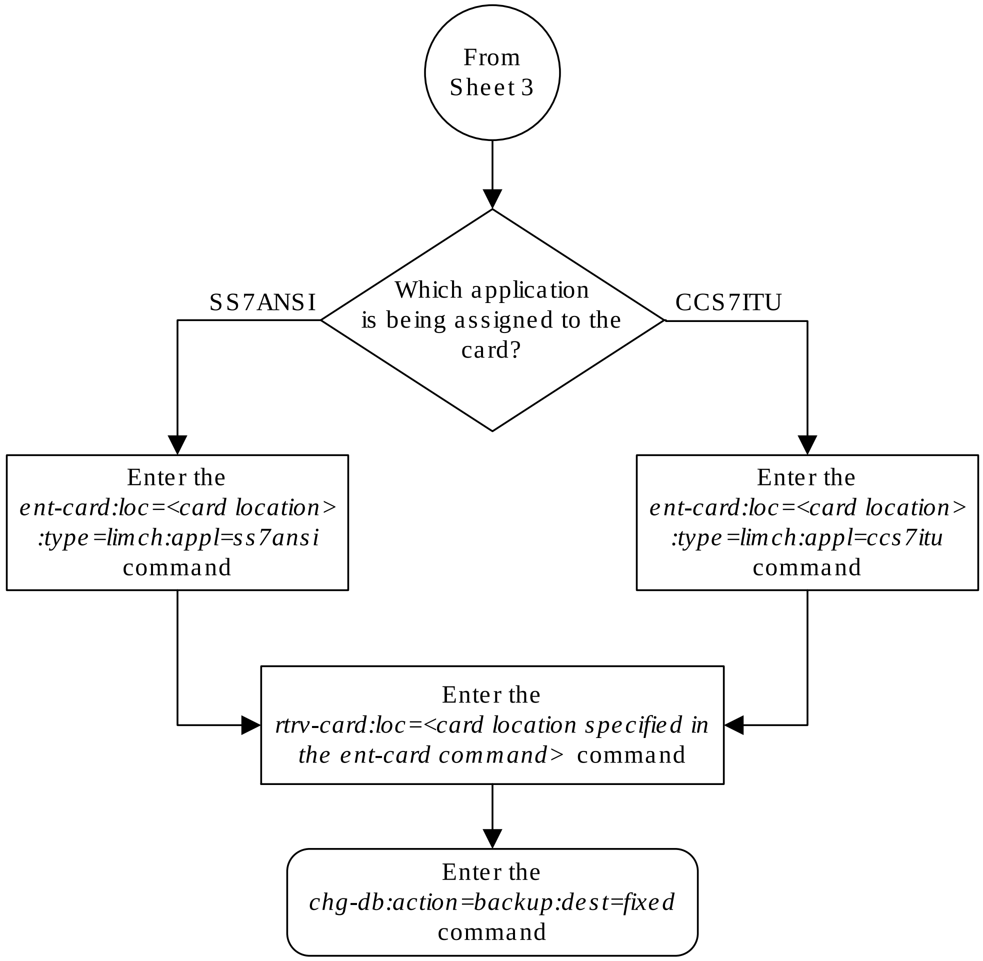
Sheet 1 of 4


From Sheet 1
Is the card you are installing an E5-E1-B or E5-T1-B card?
To Sheet 3
Enter the rtrv-stpopts command.
Is the MFC option turned on?
No
Refer to "Configuring the MFC Option" procedure to turn on the MFC option.
Yes
Is the Fan feature turned on?
No
Enter the chg-feat command with this parameter. fan=on
Yes
Verify that fans have been installed on the shelf containing the E5-E1-B or E5-T1-B card?
Have the fans been installed?
Yes
To Sheet 3
No
Refer to the Installation Manual and install the fans on the shelf containing E5-E1-B or E5-T1-B card.
Note: The fans must be installed and working properly before an E5-E1-B or E5-T1-B card can be installed in the EAGLE 5 ISS.

Sheet 2 of 4


From
Sheet 2
Which card
type is being added to
the database?
LIMCH
(See Note)
To
Sheet 4
Note: The HC MIM or E5-E1T1 card
cannot be added to the database as
a channel card (LIMCH).
LIME1
Which application
is being assigned to the
card?
CCS7ITU
SS7ANSI
Enter the
ent-card:loc=<card location>
:type=lime1:appl=ss7ansi
command
Enter the
ent-card:loc=<card location>
:type=lime1:appl=ccs7itu
command
Enter the
rtrv-card:loc=<card location specified in
the ent-card command> command
Enter the
chg-db:action=backup:dest=fixed
command

Sheet 3 of 4


From Sheet 3
Which application is being assigned to the card?
SS7ANSI
CCS7ITU
Enter the ent-card:loc=<card location> :type=limch:appl=ss7ansi command
Enter the ent-card:loc=<card location> :type=limch:appl=ccs7itu command
Enter the rtrv-card:loc=<card location specified in the ent-card command> command
Enter the chg-db:action=backup:dest=fixed command

Sheeet 4 of 4

A.5 Removing a LIM-E1 Card

This procedure is used to remove either an **E1** card or a channel card from the database using the `dlt-card` command. The card being removed must exist in the database.

If an **E1** card is being removed, then no **E1** interfaces can be assigned to the card. This can be verified with the `rtrv-e1` command. Go to the Removing the E1 Interface Parameters procedure to remove the **E1** interfaces assigned to the **E1** card being removed from the database.

If only a channel card is being removed from the database, then no **SS7** signaling links can be assigned to the card. This can be verified with the `rtrv-slk` command. Go to the Removing an SS7 Signaling Link procedure to remove the signaling links assigned to the channel card being removed from the database.

> **Caution:**
>
> If the **E1** card or channel card is the last **SS7LIM** in service, removing this card from the database will cause **SS7** traffic to be lost and isolate the **EAGLE** from the network.

The examples in this procedure are used to remove the **E1** cards in card locations 1202 and 1203.

1. Display the cards in the database using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIME1     CCS7ITU  lsne12      A    0
1202   LIMCH     CCS7ITU  lsne12      A    1
1203   LIME1     CCS7ITU  lsne13
1204   LIMCH     CCS7ITU  lsne13
1211   LIME1     CCS7ITU  lsne145     A    0
1212   LIMCH     CCS7ITU  lsne145     A    1   lsne145     A2   2
```

> **Note:**
>
> If an **E1** card is being removed from the database, skip step 2 and go to step 3.

2. Display the signaling links on the channel card you wish to remove by entering the `rtrv-slk` command, specifying the card location shown in the `rtrv-card` command output. For this example, enter this command.

   `rtrv-slk:loc=1202`

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

                                   L2T               PCR   PCR
E1   E1
LOC  LINK LSN         SLC TYPE     SET  BPS     ECM    N1    N2
LOC  PORT TS
1202 A    lsne12       1  LIMCH    1    64000   BASIC ---   -----
1201 2    1
```

   Go to the Removing an SS7 Signaling Link procedure to remove the signaling links assigned to the channel card.

   > **Note:**
   >
   > If only a channel card is being removed from the database, skip step 3 and go to step 4.

3. Display the **E1** interfaces assigned to the **E1** card being removed from the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

      E1                                                  LINK
MINSU
LOC   PORT  CRC4  CAS   ENCODE  E1TSEL    SI   SN   CHANBRDG  CLASS
RATE
1201  2     ON    OFF   HDB3    LINE      0    0    ------    CHAN
----
1203  1     OFF   ON    HDB3    EXTERNAL  3    6    ------    CHAN
----
```

   Go to the Removing the E1 Interface Parameters procedure to remove the **E1** interfaces assigned to the **E1** card.

4. Remove the card using the `dlt-card` command. The `dlt-card` command has only one parameter, `loc`, which is the location of the card. For this example, enter these commands.

   `dlt-card:loc=1201`

   `dlt-card:loc=1203`

5. Verify the changes using the `rtrv-card` command specifying the card that was removed in step 4. For this example, enter these commands.

   `rtrv-card:loc=1201`

   `rtrv-card:loc=1202`

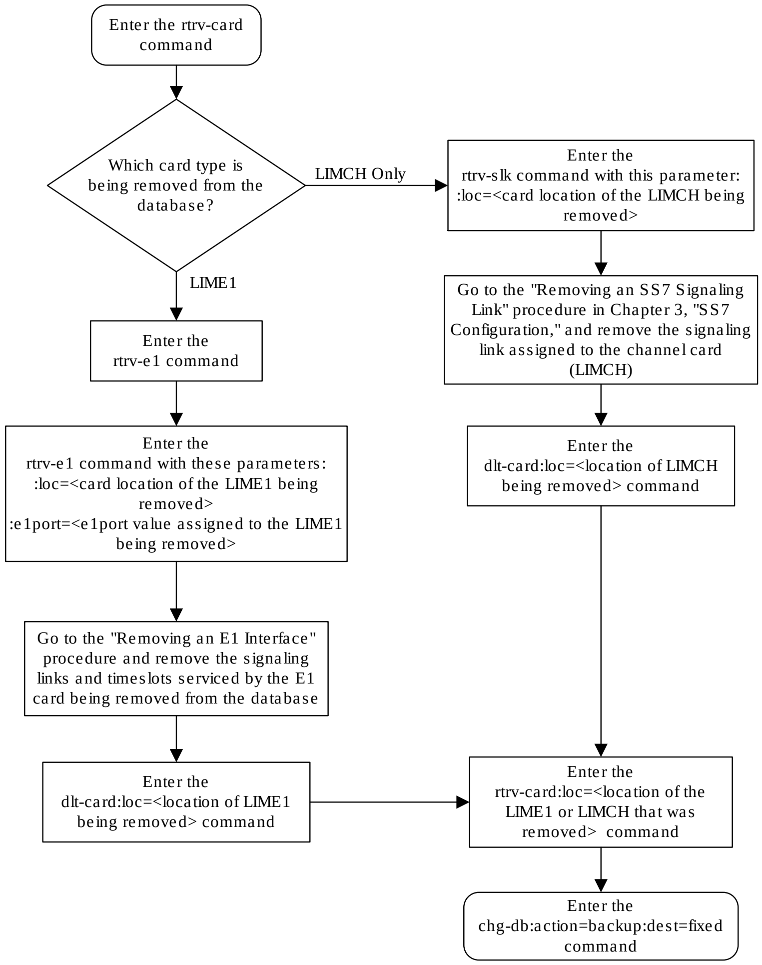
When these commands have successfully completed, this message should appear.

```
E2144 Cmd Rej: Location invalid for hardware configuration
```

6. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure A-5 Removing a LIM-E1 Card



A.6 Adding Channelized and non-Channel Bridged E1 Ports

The channelized and non-channel bridged **E1** ports are provisioned in the database using the `ent-e1` command using these parameters.

`:loc` – The location of the **E1** card (card type `lime1`) that is servicing the **E1** signaling link. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:e1port` – The **E1** port on the **E1** card used to service the **E1** signaling link. The `e1port` value cannot already be assigned to the **E1** card specified by the `loc` parameter.

`:crc4` – Specifies whether or not **CRC4** is enabled on the **E1** signaling link. The default value is `on` (`crc4=on`).

`:cas` – Specifies whether **CAS** or **CCS** is used on the **E1** signaling link. **CAS** is enabled with the `cas=on` parameter. **CCS** is enabled with the `cas=off` parameter. The default value is **CCS** enabled (`cas=off`). The `cas=on` parameter cannot be specified for an **HC-MIM** or an **E5-E1T1** card.

`:encode` – Specifies the type of encoding or decoding that is used on the **E1** signaling link, either **HDB3** or **AMI**. The default value is **HDB3** encoding (`encode=hdb3`). **AMI** encoding can be specified only for an **HC-MIM**, or an **E5-E1T1** card.

`:e1tsel` – The timing source for the **E1** signaling link, master (`external`), slave (`line`), or `recovered`. The default value is slave timing (`e1tsel=line`).

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and cannot be used in this procedure.

> **Note:**
>
> To use an external high-speed master clock source other than **RS**-422, **TDMs** 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3. The default value is 0 (`si=0`).

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31. The default value is 0 (`sn=0`).

The `ent-e1` command contains other parameters that are not used in this procedure. These parameters and their usage are described in these sections:

- `e1tsel=recovered`, `chanbrdg`, and `force=yes` – Adding Channel Bridged E1 Ports.
- `linkclass` and `minsurate` – Adding Unchannelized E1 Ports.

The **E1** card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

If the `cas=on` parameter is specified with the `ent-e1` command, timeslot 16 cannot be used when the **E1** signaling link is provisioned with the `ent-slk` command in Adding an E1 Signaling Link.

The **E1** card cannot contain channelized and unchannelized **E1** ports.

1. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters. This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
```

```
      E1                                                      LINK
MINSU
LOC    PORT   CRC4   CAS    ENCODE   E1TSEL     SI   SN    CHANBRDG   CLASS
RATE
1201   1      ON     OFF    HDB3     EXTERNAL   2    6     ------     CHAN
----
1201   2      ON     OFF    HDB3     EXTERNAL   3    5     ------     CHAN
----
1202   1      ON     OFF    HDB3     EXTERNAL   1    10    ------     CHAN
----
1203   1      ON     OFF    HDB3     EXTERNAL   1    11    ------     CHAN
----
1203   2      ON     OFF    HDB3     EXTERNAL   3    7     ------     CHAN
----
1204   1      ON     OFF    HDB3     EXTERNAL   3    8     ------     CHAN
----
1211   2      ON     OFF    HDB3     EXTERNAL   0    0     ------     CHAN
----
1212   1      ON     OFF    HDB3     EXTERNAL   1    1     ------     CHAN
----
1213   1      ON     OFF    HDB3     EXTERNAL   2    2     ------     CHAN
----
1213   5      ON     OFF    HDB3     EXTERNAL   3    3     ------     CHAN
----
```

Continue the procedure by performing one of these substeps.

a. If the **E1** card that the E1 port is being assigned to in this procedure is not shown in the `rtrv-e1` output, or if the E1 card has unchannelized E1 ports assigned to it, continue the procedure with 2 to verify if there are any E1 cards in the database that have no E1 ports assigned to them.

b. If the `rtrv-e1` output shows that the E1 card has channel bridged E1 ports assigned to it, or that E1 ports 3, 4, 5, 6, 7, or 8 are assigned to the E1 card, the E1 card is an HC MIM or an E5-E1T1 card. Continue the procedure with 7 to add the E1 port with the parameters allowed for an HC MIM or an E5-E1T1 card.

c. If the `rtrv-e1` output shows that the E1 card does not have channel bridged E1 ports assigned to it, or that E1 ports 3, 4, 5, 6, 7, or 8 are not assigned to the E1 card, verify the type of E1 card that the E1 port will be assigned to. The E1 card types and their part numbers are shown in Table A-4. If the E1 card is an HC MIM or an E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the E1 cards shown in this step are on the same shelf as the card that will contain the E1 port that is being added, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure with 7.
   - If the E1 cards shown in this step are not on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 3.
   - If the E1 cards shown in this step are on the same shelf as the card that will contain the E1 port that is being added, and these cards do not have

E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 3.

d. If the E1 card you wish to use in this procedure has all the E1 ports that are allowed to be assigned to it, select another E1 card to add the E1 port to, or continue the procedure with 2 to verify if there are any E1 cards in the database that have no E1 ports assigned to them. Table A-7 shows the number of E1 ports that are allowed for the different E1 card types.

Table A-7 Maximum Number of E1 Ports

E1 Card Types	Maximum Number of E1 Ports
HC MIM	8
E5-E1T1	8

2. Display the cards in the **EAGLE** using the `rtrv-card` command. This is an example of the possible output.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIME1     CCS7ITU  lsn1        A    13  lsn1        B    12
1202   LIMCH     CCS7ITU  lsn1        A    0   lsn1        B    8
1203   LIME1     CCS7ITU  lsn1        A1   4   lsn1        B1   9
1204   LIMCH     CCS7ITU  lsn1        A2   5   lsn1        A3   6
1211   LIME1     CCS7ITU  lsn1        A    14
1212   LIMCH     CCS7ITU  lsn1        A    10  lsn1        B    11
1213   LIME1     CCS7ITU  lsn1        A4   1   lsn1        A5   7
                          lsn1        B5   2   lsn1        A6   3
```

Continue the procedure by performing one of these substeps.

a. If the desired E1 card is not shown in the `rtrv-card` output, perform Adding a LIM-E1 Card to add the desired E1 card. If you wish to assign E1 ports 3, 4, 5, 6, 7, or 8 to the E1 card, the E1 card being added must be an HC MIM or an E5-E1T1 card.

b. If the E1 card that will be used in this procedure is an HC MIM or an E5-E1T1 card, continue the procedure by performing one of these steps.
   - If E1 cards are shown in 1 that are on the same shelf as the card that will contain the E1 port that is being added, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure with 7 to add the E1 port with the parameters allowed for an HC MIM or an E5-E1T1 card.
   - If no E1 cards, shown in 1, are not on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 3.
   - If E1 cards are shown in 1 that are on the same shelf as the card that will contain the E1 port that is being added, and these cards do not have E1 ports 3 through

8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 3.

3. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the E1 port being added in this procedure by entering this command.

   ```
   rept-stat-gpl:gpl=hipr2
   ```

   This is an example of the possible output.

   ```
   rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
   GPL         CARD      RUNNING            APPROVED      TRIAL
   HIPR2       1109      126-002-000        126-002-000   126-003-000
   HIPR2       1110      126-002-000        126-002-000   126-003-000
   HIPR2       1209      126-002-000        126-002-000   126-003-000
   HIPR2       1210      126-002-000        126-002-000   126-003-000
   HIPR2       1309      126-002-000        126-002-000   126-003-000
   HIPR2       1310      126-002-000        126-002-000   126-003-000
   HIPR2       2109      126-002-000        126-002-000   126-003-000
   HIPR2       2110      126-002-000        126-002-000   126-003-000
   Command Completed
   ```

   If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure with 7.
   - If the card is an HC MIM, continue the procedure with 4.

   If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure with 7.
   - If the card is an HC MIM, continue the procedure with 4.

4. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 7.

   If the Fan feature is off, continue the procedure with Oracle.

5. Turn the Fan feature on by entering this command.

   ```
   chg-feat:fan=on
   ```

> **Note:**
>
> Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 09-05-28 11:43:04 GMT EAGLE5 41.0.0
CHG-FEAT: MASP A - COMPLTD
```

6. The shelf containing the HC MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

   If the fans are installed, continue the procedure with 7.

   If the fans are not installed on the shelf containing the HC MIM, go to*Installation Guide* and install the fans. After the fans have been installed and tested, continue the procedure with 7.

7. Add the new **E1** interface information to the database using the `ent-e1` command and the parameter combinations shown in Table A-8 , based on the type of **E1** card being used.

Table A-8 E1 Interface Parameter Combinations

HC-MIM or an E5 E1T1 Card without Channel Bridging
Mandatory Parameters
:loc=location of the E1 card
:e1port=1, 2, 3, 4, 5, 6, 7, 8
Optional Parameters
:cas=off Default value = off
:crc4=on, off Default value = on
:encode=ami, hdb3 Default value = hdb3
:si=0 - 3 Default value = 0
:sn=0 - 31 Default value = 0
:e1tsel=line, external Default value = line

Table A-8 (Cont.) E1 Interface Parameter Combinations

HC-MIM or an E5 E1T1 Card without Channel Bridging
Notes: 1. **Channel** cards cannot be specified with the `ent-e1` command. 2. To configure the **E1** port for master timing, use the `e1tsel=external` parameter. 3. The `linkclass=chan` parameter configures a channelized **E1** port. Specifying the `linkclass=chan` parameter in this procedure is unnecessary as this is the default value for the `linkclass` parameter.

For this example, enter these commands.

`ent-e1:loc=1203:e1port=2:encode=hdb3:e1tsel=line:si=1:sn=7`

`ent-e1:loc=1211:e1port=2:crc4=on:encode=hdb3:e1tsel=line`

8. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 7 . For this example, enter these commands.

`rtrv-e1:loc=1203:e1port=2`

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0

      E1                                                    LINK
MINSU
LOC   PORT  CRC4  CAS   ENCODE  E1TSEL     SI   SN  CHANBRDG  CLASS
RATE
1203  2     OFF   OFF   HDB3    LINE       1    7   ------    CHAN
----

TS0  (N/A)     TS8   ------    TS16  ------    TS24  ------
TS1  ------    TS9   ------    TS17  ------    TS25  ------
TS2  ------    TS10  ------    TS18  ------    TS26  ------
TS3  ------    TS11  ------    TS19  ------    TS27  ------
TS4  ------    TS12  ------    TS20  ------    TS28  ------
TS5  ------    TS13  ------    TS21  ------    TS29  ------
TS6  ------    TS14  ------    TS22  ------    TS30  ------
TS7  ------    TS15  ------    TS23  ------    TS31  ------
```

`rtrv-e1:loc=1211:e1port=2`

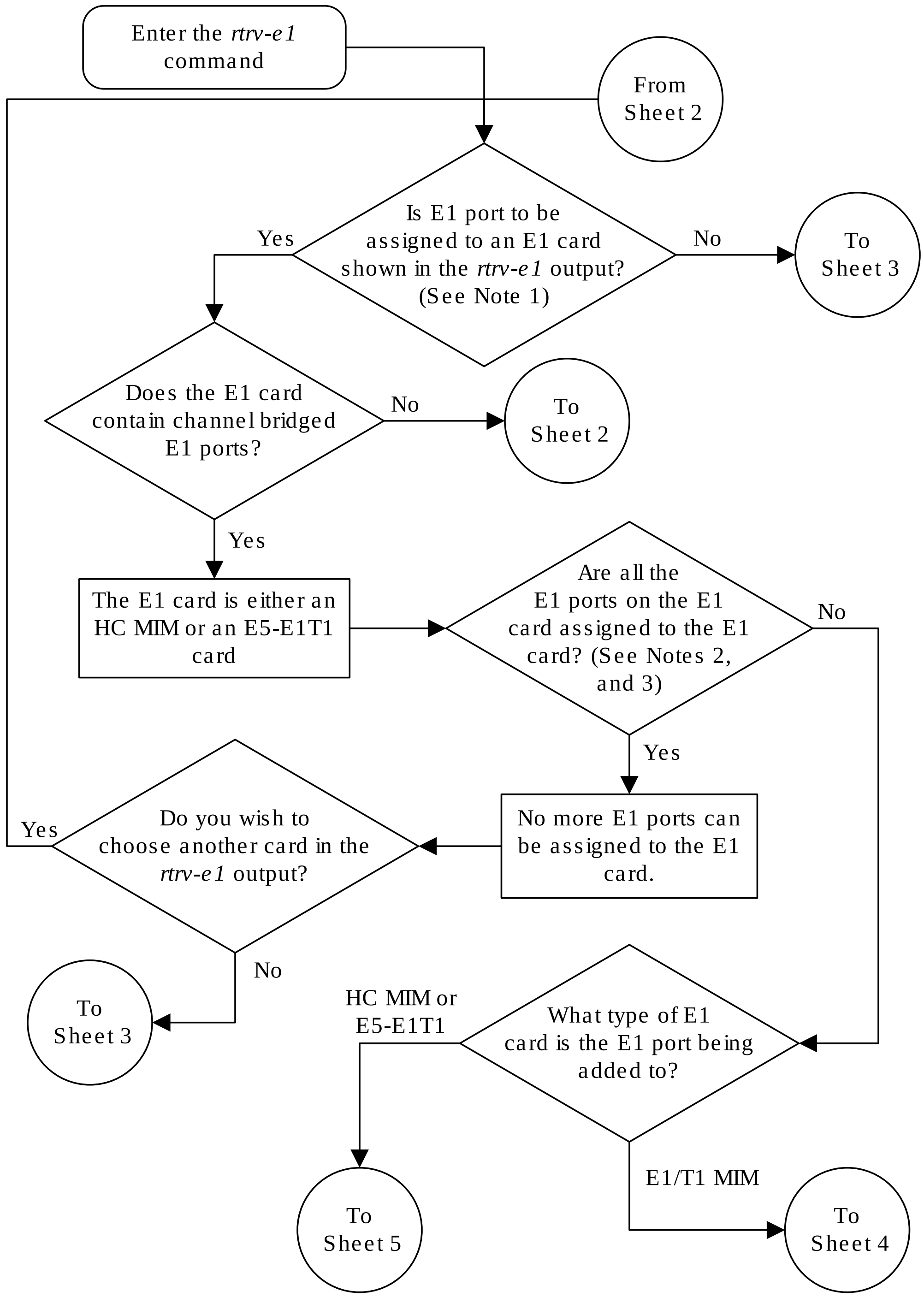
```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0

      E1                                                    LINK
MINSU
LOC   PORT  CRC4  CAS   ENCODE  E1TSEL     SI   SN  CHANBRDG  CLASS
RATE
1211  2     ON    OFF   HDB3    LINE       0    0   ------    CHAN
----

TS0  (N/A)     TS8   ------    TS16  ------    TS24  ------
TS1  ------    TS9   ------    TS17  ------    TS25  ------
TS2  ------    TS10  ------    TS18  ------    TS26  ------
```

```
TS3  ------    TS11  ------    TS19  ------    TS27  ------
TS4  ------    TS12  ------    TS20  ------    TS28  ------
TS5  ------    TS13  ------    TS21  ------    TS29  ------
TS6  ------    TS14  ------    TS22  ------    TS30  ------
TS7  ------    TS15  ------    TS23  ------    TS31  ------
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure A-6 Adding Channelized and non-Channel Bridged E1 Ports



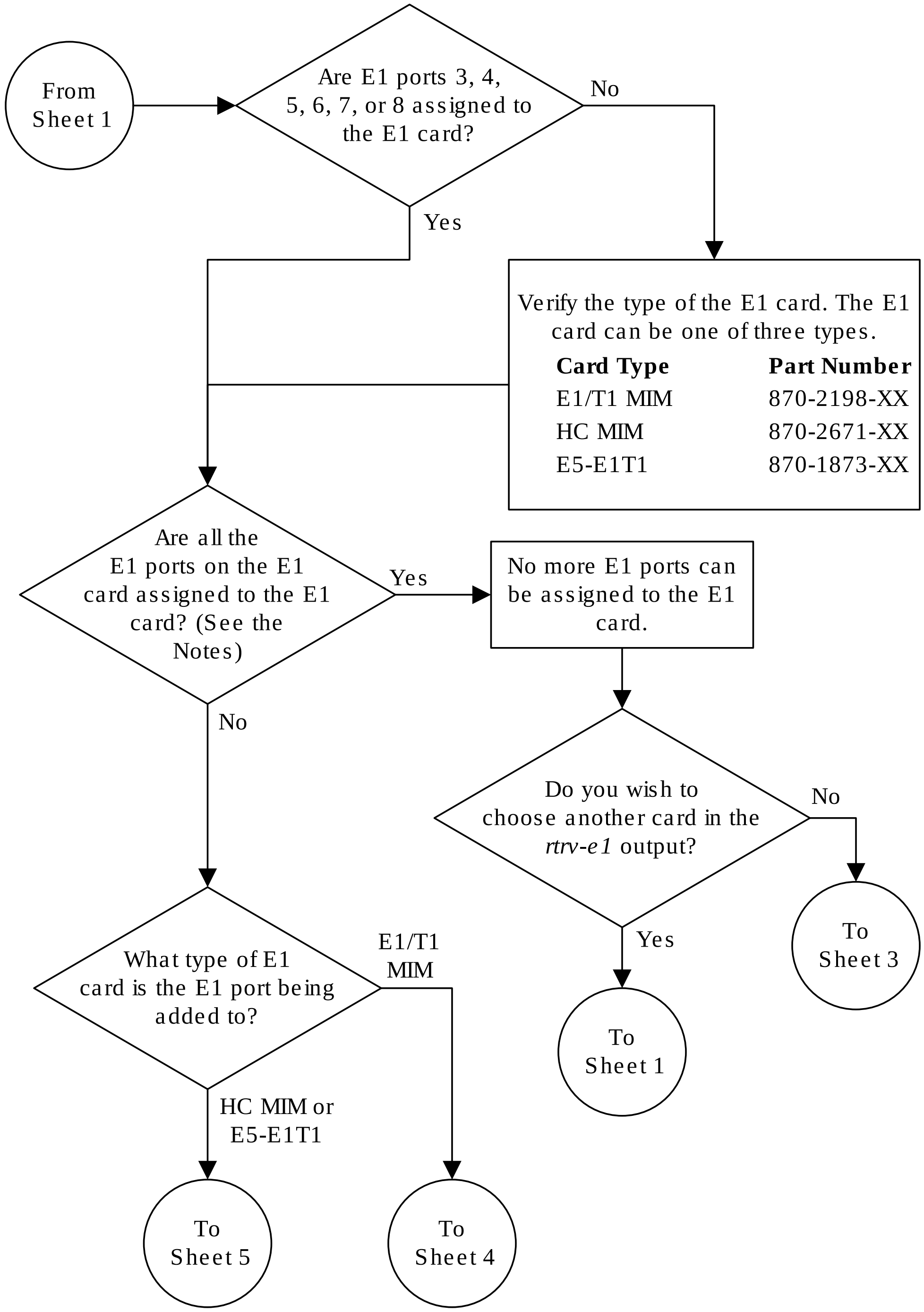
Notes:

1. E1 ports assigned in this procedure cannot be assigned to an E1 card containing unchannelized E1 ports.

2. The E1/T1 MIM can have only E1 ports 1 and 2 assigned to it.

3. The HC MIM or E5-E1T1 card can have E1 ports 1 through 8 assigned to it.

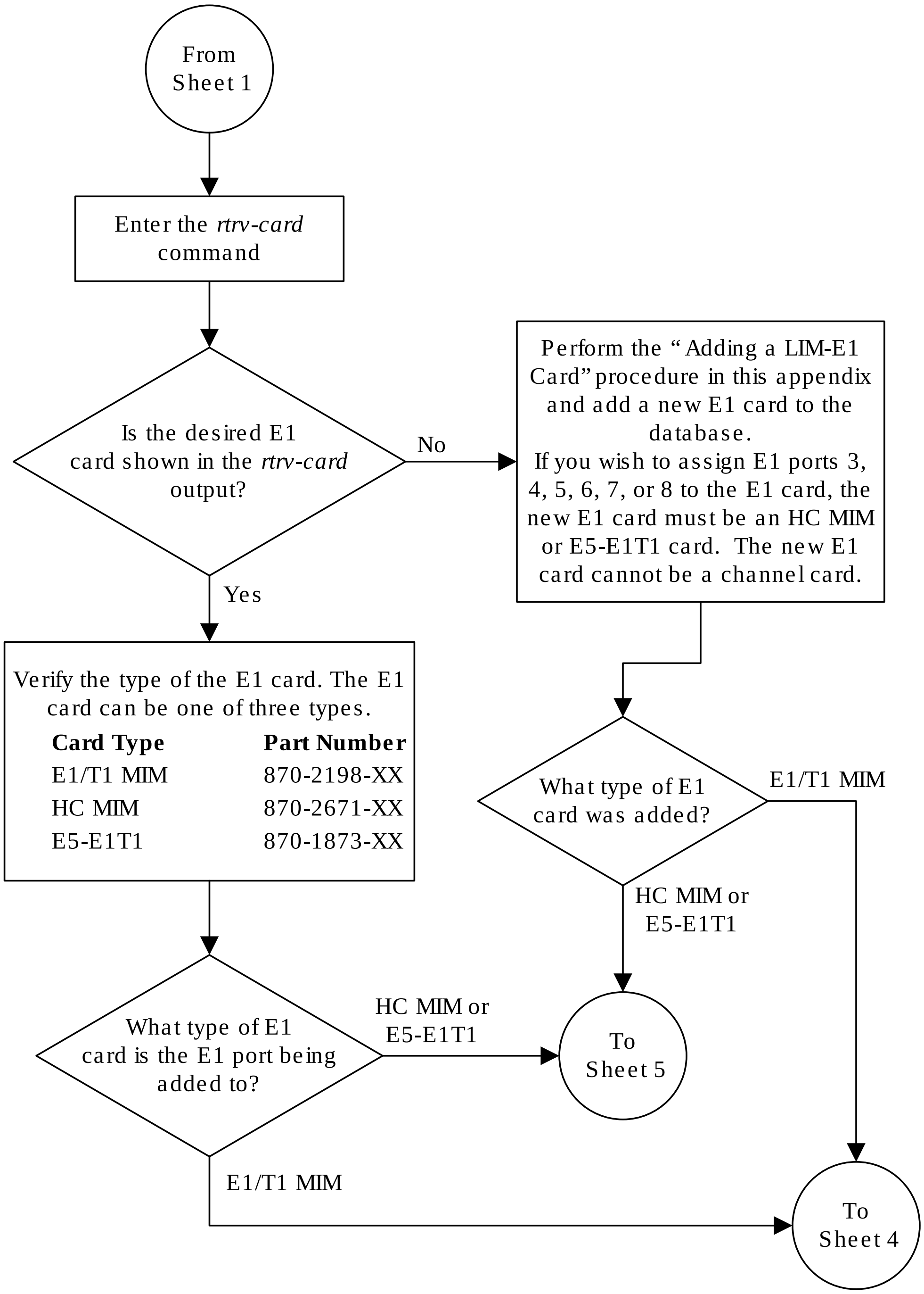
Sheet 1 of 7



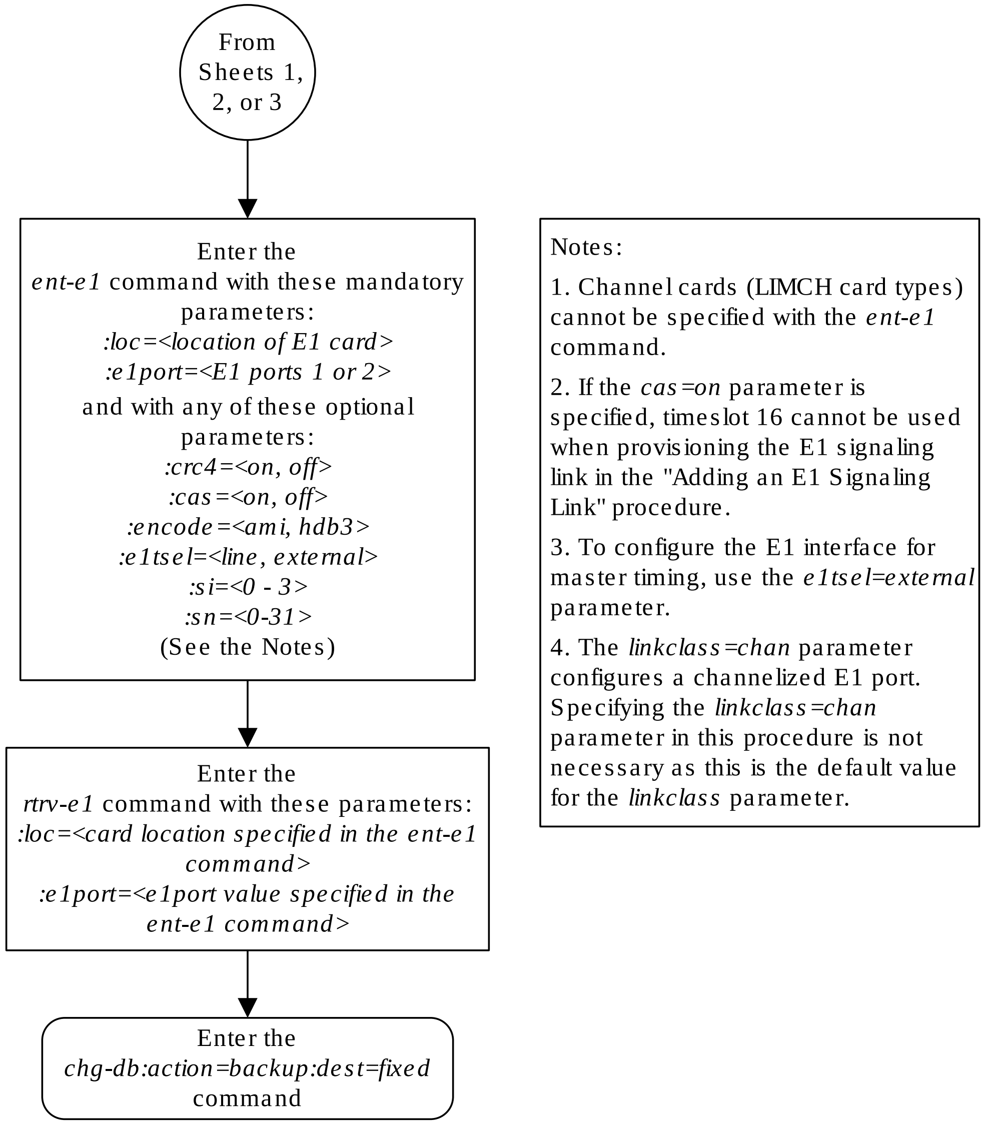
Notes:

1. The E1/T1 MIM can have only E1 ports 1 and 2 assigned to it.
2. The HC MIM or E5-E1T1 card can have E1 ports 1 through 8 assigned to it.

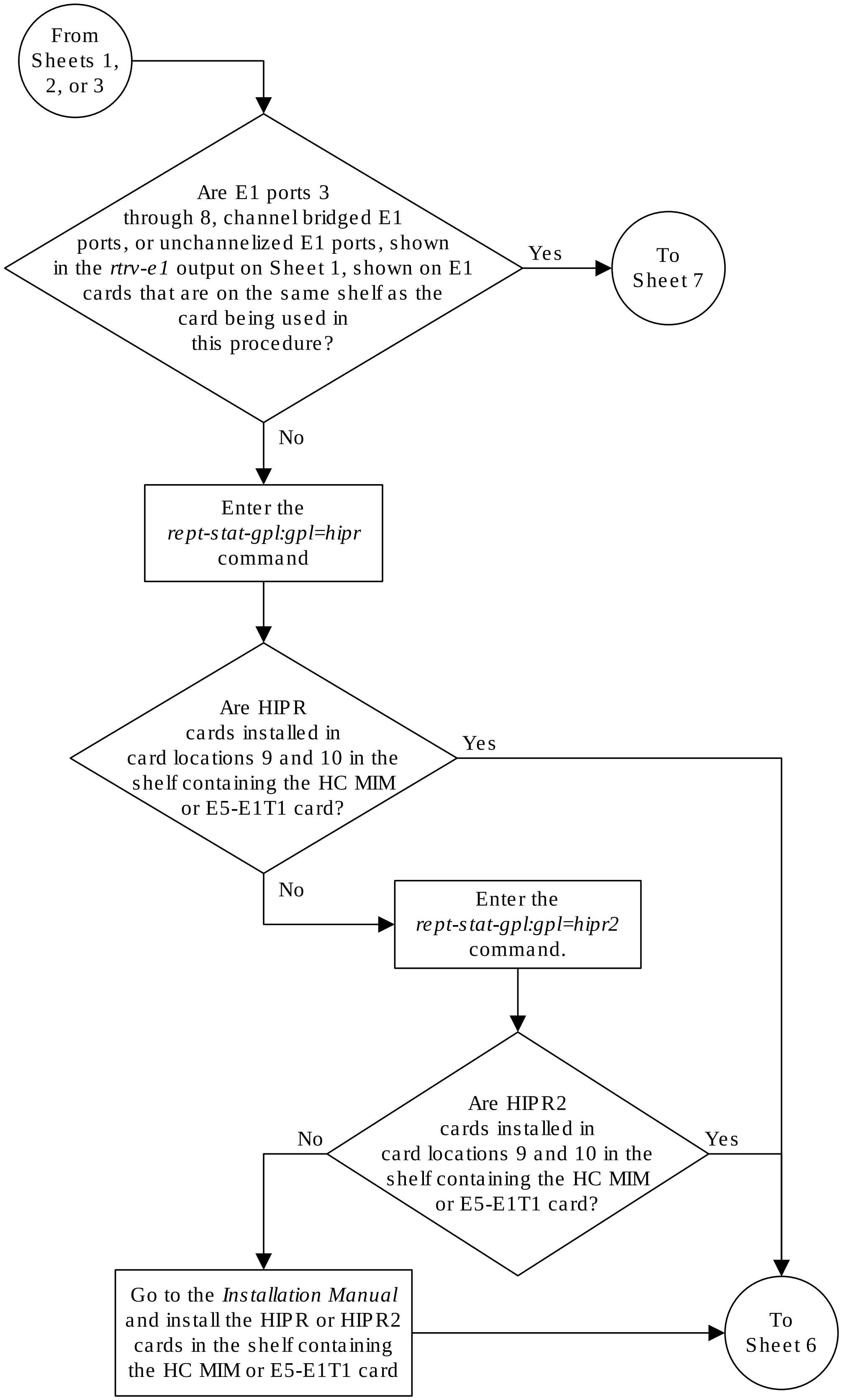
Sheet 2 of 7


From Sheet 1
Enter the *rtrv-card* command
Is the desired E1 card shown in the *rtrv-card* output?
No
Perform the "Adding a LIM-E1 Card" procedure in this appendix and add a new E1 card to the database.
If you wish to assign E1 ports 3, 4, 5, 6, 7, or 8 to the E1 card, the new E1 card must be an HC MIM or E5-E1T1 card. The new E1 card cannot be a channel card.
Yes
Verify the type of the E1 card. The E1 card can be one of three types.
Card Type | Part Number
E1/T1 MIM | 870-2198-XX
HC MIM | 870-2671-XX
E5-E1T1 | 870-1873-XX
What type of E1 card was added?
E1/T1 MIM
HC MIM or E5-E1T1
What type of E1 card is the E1 port being added to?
HC MIM or E5-E1T1
To Sheet 5
E1/T1 MIM
To Sheet 4

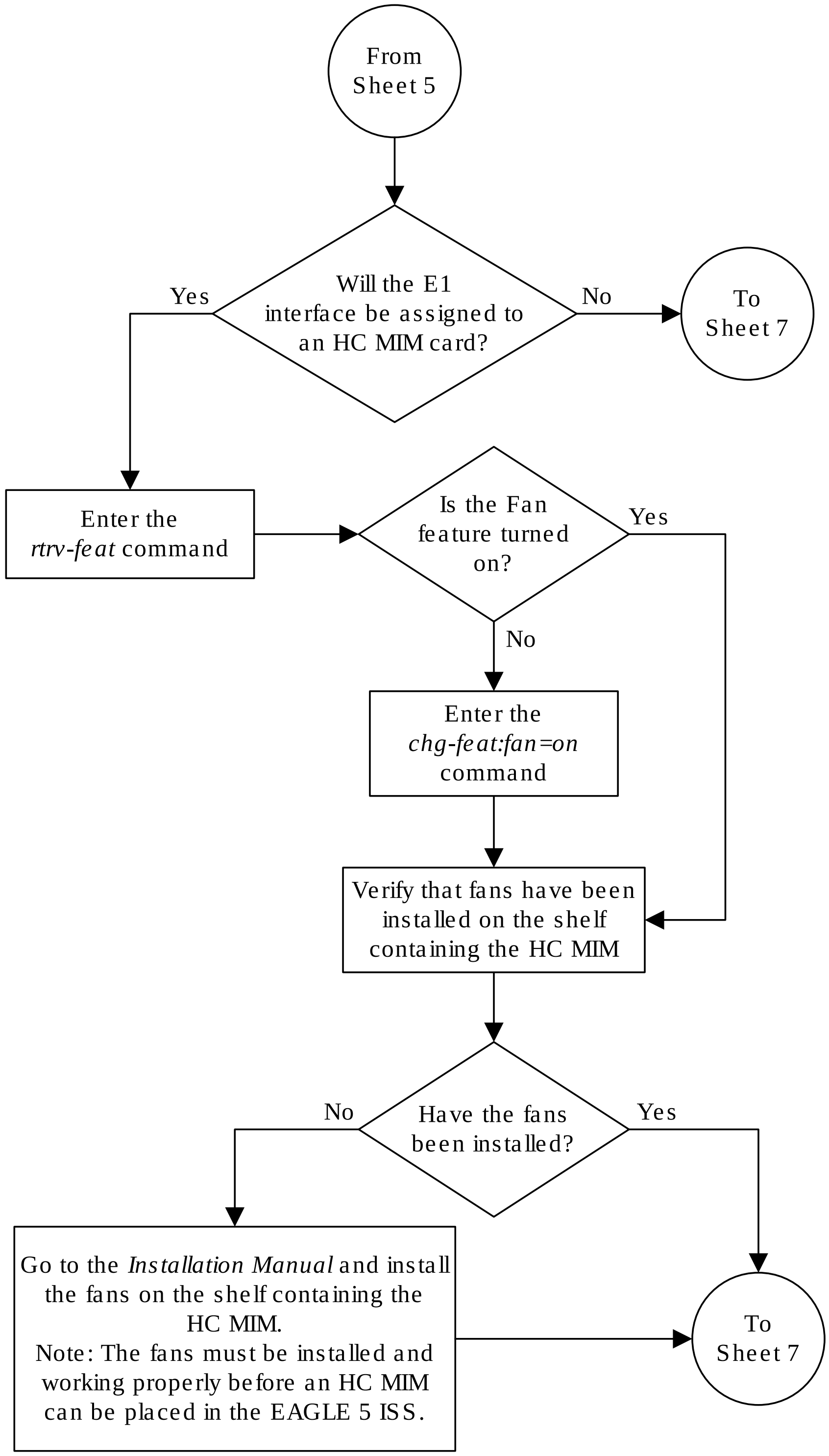
Sheet 3 of 7


From Sheets 1, 2, or 3
Enter the ent-e1 command with these mandatory parameters:
:loc=<location of E1 card>
:e1port=<E1 ports 1 or 2>
and with any of these optional parameters:
:crc4=<on, off>
:cas=<on, off>
:encode=<ami, hdb3>
:e1tsel=<line, external>
:si=<0 - 3>
:sn=<0-31>
(See the Notes)
Enter the rtrv-e1 command with these parameters:
:loc=<card location specified in the ent-e1 command>
:e1port=<e1port value specified in the ent-e1 command>
Enter the chg-db:action=backup:dest=fixed command
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the ent-e1 command.
2. If the cas=on parameter is specified, timeslot 16 cannot be used when provisioning the E1 signaling link in the "Adding an E1 Signaling Link" procedure.
3. To configure the E1 interface for master timing, use the e1tsel=external parameter.
4. The linkclass=chan parameter configures a channelized E1 port. Specifying the linkclass=chan parameter in this procedure is not necessary as this is the default value for the linkclass parameter.

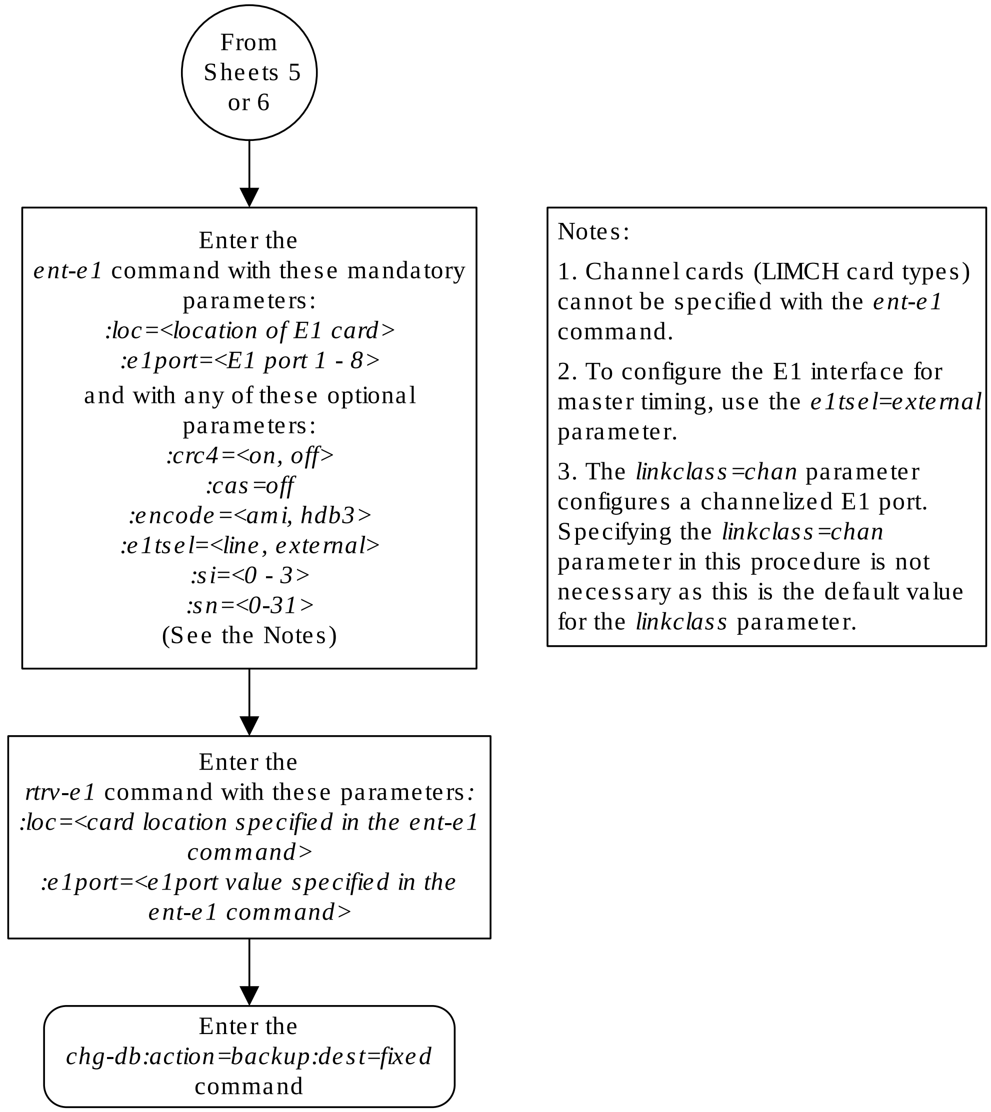
Sheet 4 of 7


From Sheets 1, 2, or 3
Are E1 ports 3 through 8, channel bridged E1 ports, or unchannelized E1 ports, shown in the rtrv-e1 output on Sheet 1, shown on E1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 7
No
Enter the rept-stat-gpl:gpl=hipr command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the rept-stat-gpl:gpl=hipr2 command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the Installation Manual and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 6

Sheet 5 of 7


From Sheet 5
Will the E1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 7
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 7

Sheet 6 of 7


From Sheets 5 or 6
Enter the ent-e1 command with these mandatory parameters:
:loc=<location of E1 card>
:e1port=<E1 port 1 - 8>
and with any of these optional parameters:
:crc4=<on, off>
:cas=off
:encode=<ami, hdb3>
:e1tsel=<line, external>
:si=<0 - 3>
:sn=<0-31>
(See the Notes)
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the ent-e1 command.
2. To configure the E1 interface for master timing, use the e1tsel=external parameter.
3. The linkclass=chan parameter configures a channelized E1 port. Specifying the linkclass=chan parameter in this procedure is not necessary as this is the default value for the linkclass parameter.
Enter the rtrv-e1 command with these parameters:
:loc=<card location specified in the ent-e1 command>
:e1port=<e1port value specified in the ent-e1 command>
Enter the chg-db:action=backup:dest=fixed command

Sheet 7 of 7

A.7 Adding Channel Bridged E1 Ports

The channel bridged **E1** ports are provisioned in the database using the `ent-e1` command using these parameters.

`:loc` – The location of the **E1** card (card type `lime1`) that is servicing the **E1** signaling link. The **E1** card must be an **HC-MIM** or an **E5-E1T1** card. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:e1port` – The **E1** port on the **E1** card used to service the **E1** signaling link. The `e1port` value cannot already be assigned to the **E1** card specified by the `loc` parameter.

`:crc4` – Specifies whether or not **CRC4** is enabled on the **E1** signaling link. The default value is `on` (`crc4=on`).

`:cas` – Specifies whether **CAS** or **CCS** is used on the **E1** signaling link. **CAS** is enabled with the `cas=on` parameter. **CCS** is enabled with the `cas=off` parameter. The default value is **CCS** enabled (`cas=off`). The `cas=on` parameter cannot be specified for an **HC-MIM** or an **E5-E1T1** card.

`:encode` – Specifies the type of encoding or decoding that is used on the **E1** signaling link, either **HDB3** or **AMI**. The default value is **HDB3** encoding (`encode=hdb3`).

`:e1tsel` – The timing source for the **E1** signaling link, master (`external`) or `recovered`. The default value is slave timing (`e1tsel=line`) which cannot be used for a channel bridged **E1** port.

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3. The default value is 0 (`si=0`).

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31. The default value is 0 (`sn=0`).

`:force=yes` – Required when the even numbered **E1** port being channel bridged is provisioned in the database before this procedure is performed.

`:chanbrdg` – Specifies whether or not the odd numbered **E1** port specified in this procedure is channel bridged to its adjacent even numbered **E1** port. Table A-9 shows the **E1** ports that can be specified with the `chanbrdg=on` parameter and the even-numbered **E1** ports that are bridged to the odd numbered **E1** port.

Table A-9 Channel Bridging Ports

Odd Numbered E1 Port	Even Numbered Bridged E1 Port
1	2
3	4
5	6
7	8

The `ent-e1` command contains the `linkclass` and `minsurate` parameters that are not used in this procedure. These parameters and their usage are described in Adding Unchannelized E1 Ports.

The **E1** card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

The **E1** card cannot contain channelized and un-channelized **E1** ports.

1. Display the cards in the **EAGLE** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIME1     CCS7ITU  lsn1        A    13  lsn1        B    12
1202   LIMCH     CCS7ITU  lsn1        A    0   lsn1        B    8
1203   LIME1     CCS7ITU  lsn1        A1   4   lsn1        B1   9
1204   LIMCH     CCS7ITU  lsn1        A2   5   lsn1        A3   6
1211   LIME1     CCS7ITU  lsn1        A    14
1212   LIMCH     CCS7ITU  lsn1        A    10  lsn1        B    11
1213   LIME1     CCS7ITU  lsn1        A4   1   lsn1        A5   7
                          lsn1        B5   2   lsn1        A6   3
```

   If there no LIME1 cards shown in the `rtrv-card` output, perform Adding a LIM-E1 Card to add an HC-MIM or an E5-E1T1 card to the database. Continue the procedure with 2.

   If LIME1 cards are shown in the `rtrv-card` output, continue the procedure with 2.

2. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters. This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

      E1                                                     LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
```

```
RATE
1201  1     ON     OFF  HDB3     EXTERNAL  2   6   ------     CHAN     ----
1201  2     ON     OFF  HDB3     EXTERNAL  3   5   ------     CHAN     ----
1202  1     ON     OFF  HDB3     EXTERNAL  1   10  ------     CHAN     ----
1203  1     ON     OFF  HDB3     EXTERNAL  1   11  ------     CHAN     ----
1203  2     ON     OFF  HDB3     EXTERNAL  3   7   ------     CHAN     ----
1204  1     ON     OFF  HDB3     EXTERNAL  3   8   ------     CHAN     ----
1211  2     ON     OFF  HDB3     EXTERNAL  0   0   ------     CHAN     ----
1212  1     ON     OFF  HDB3     EXTERNAL  1   1   ------     CHAN     ----
1213  1     ON     OFF  HDB3     EXTERNAL  2   2   ------     CHAN     ----
1213  5     ON     OFF  HDB3     EXTERNAL  3   3   ------     CHAN     ----
```

Continue the procedure by performing one of these substeps.

a. If the `rtrv-e1` output shows that the E1 card has E1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that E1 ports on the E1 card are channel bridged, continue this procedure with 3.

b. Channel bridged E1 ports cannot be added to an E1 card containing unchannelized E1 ports. If the E1 card contains unchannelized E1 ports, choose another E1 card from 1 and repeat this step, or add a new HC-MIM or an E5-E1T1 card by performing Adding a LIM-E1 Card.

c. If the `rtrv-e1` output shows that the E1 card does not have E1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that E1 ports on the E1 card are not channel bridged, verify that the E1 card that the channel bridged E1 port will be assigned to is an HC-MIM or an E5-E1T1 card. The part number of the HC-MIM is 870-2671-XX. The part number of the E5-E1T1 is 870-1873-XX. If the E1 card is not an HC-MIM or an E5-E1T1 card, add a new HC-MIM or an E5-E1T1 card by performing Adding a LIM-E1 Card.

   - If an existing E1 card is being used in this procedure continue the procedure with 3.
   - If an HC-MIM or an E5-E1T1 card was added in this substep or substep b, continue the procedure by performing one of these steps.
     – If the E1 cards shown in this step are on the same shelf as the card that will contain the E1 port that is being added, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure with 8.
     – If the E1 cards shown in this step are not on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 4.
     – If the E1 cards shown in this step are on the same shelf as the card that will contain the E1 port that is being added, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 4.

3. Display the **E1** signaling links in the **EAGLE** by entering this command.

`rtrv-slk:class=e1`

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

                                    L2T                 PCR  PCR    E1    E1
LOC   LINK LSN            SLC TYPE  SET  BPS     ECM    N1   N2     LOC   PORT
```

```
TS
1201 A    lsn1          13 LIME1    1    56000  BASIC ---  -----
1201 2    25
1201 B    lsn1          12 LIME1    1    56000  BASIC ---  -----
1201 1    20
1202 A    lsn1          0  LIMCH    1    56000  BASIC ---  -----
1201 1    5
1202 B    lsn1          8  LIMCH    1    56000  BASIC ---  -----
1201 1    1
1203 A1   lsn1          4  LIME1    1    56000  BASIC ---  -----
1203 2    20
1203 B1   lsn1          9  LIME1    1    56000  BASIC ---  -----
1203 1    2
1204 A2   lsn1          5  LIMCH    1    56000  BASIC ---  -----
1203 1    21
1204 A3   lsn1          6  LIMCH    1    56000  BASIC ---  -----
1203 1    22
1211 A    lsn1          14 LIME1    1    56000  BASIC ---  -----
1211 1    7
1212 A    lsn1          10 LIMCH    1    56000  BASIC ---  -----
1211 1    28
1212 B    lsn1          11 LIMCH    1    56000  BASIC ---  -----
1211 1    25
1213 A4   lsn1          1  LIME1    1    56000  BASIC ---  -----
1213 1    17
1213 A5   lsn1          7  LIME1    1    56000  BASIC ---  -----
1213 5    23
1213 B5   lsn1          2  LIME1    1    56000  BASIC ---  -----
1213 1    24
1213 A6   lsn1          3  LIME1    1    56000  BASIC ---  -----
1213 5    19
```

If an even numbered **E1** port is to be channel bridged, and that **E1** port is assigned to signaling links, these signaling links must be removed before the **E1** port can be channel bridged. Perform Removing an SS7 Signaling Link and remove these signaling links. After the signaling links have been removed, continue the procedure with 4.

If the even numbered **E1** port to be channel bridged is not assigned to signaling links, continue the procedure with 4.

4. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the E1 port being added in this procedure by entering this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD      RUNNING            APPROVED      TRIAL
HIPR2       1109      126-002-000        126-002-000   126-003-000
HIPR2       1110      126-002-000        126-002-000   126-003-000
HIPR2       1209      126-002-000        126-002-000   126-003-000
HIPR2       1210      126-002-000        126-002-000   126-003-000
```

```
HIPR2       1309      126-002-000         126-002-000    126-003-000
HIPR2       1310      126-002-000         126-002-000    126-003-000
HIPR2       2109      126-002-000         126-002-000    126-003-000
HIPR2       2110      126-002-000         126-002-000    126-003-000
Command Completed
```

If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 8.
- If the card is an HC MIM, continue the procedure with 5.

If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 8.
- If the card is an HC MIM, continue the procedure with 5.

5. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the Fan feature is on, continue the procedure with 8.

If the Fan feature is off, continue the procedure with Oracle.

6. Turn the Fan feature on by entering this command.

`chg-feat:fan=on`

> **Note:**
>
> Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Oracle Sales Representative or Account Representative.

When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 09-05-28 11:43:04 GMT EAGLE5 41.0.0
CHG-FEAT: MASP A - COMPLTD
```

7. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

   If the fans are installed, continue the procedure with 8.

   If the fans are not installed on the shelf containing the HC-MIM, go to *Installation Guide* and install the fans. After the fans have been installed and tested, continue the procedure with 8.

8. Add the new **E1** interface information to the database using the `ent-e1` command and the parameter combinations shown in Table A-10.

   Table A-10 Channel Bridged E1 Port Combinations

Mandatory Parameters	
:loc=location of the **E1** card	:e1tsel=external, recovered
:e1port=1, 3, 5, 7	:chanbrdg=on
Optional Parameters	
:cas=off Default value = off	:si=0 - 3 Default value = 0
:crc4=on, off Default value = on	:sn=0 - 31 Default value = 0
:encode=ami, hdb3 Default value = hdb3	:force=yes
Notes: 1. **Channel** cards cannot be specified with the `ent-e1` command. 2. To configure the **E1** port for master timing, use the `e1tsel=external` parameter. 3. The `linkclass=chan` parameter configures a channelized **E1** port. Specifying the `linkclass=chan` parameter in this procedure is unnecessary as this is the default value for the `linkclass` parameter. 4. The **E1** card cannot contain channelized and un-channelized **E1** ports. 5. The `force=yes` parameter must be used when the even numbered port being channel bridged is shown in the `rtrv-e1` output in 2 . If the even numbered port being channel bridged is not shown in the `rtrv-e1` output in 2 , the `force=yes` parameter cannot be used.	

   For this example, enter these commands.

   ```
   ent-
   e1:loc=1301:e1port=1:encode=hdb3:e1tsel=external:si=1:sn=7:c
   hanbrdg=on
   ```

   ```
   ent-
   e1:loc=1303:e1port=1:crc4=on:encode=hdb3:e1tsel=recovered:ch
   anbrdg=on
   ```

9. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 8 . For this example, enter these commands.

   ```
   rtrv-e1:loc=1301:e1port=1
   ```

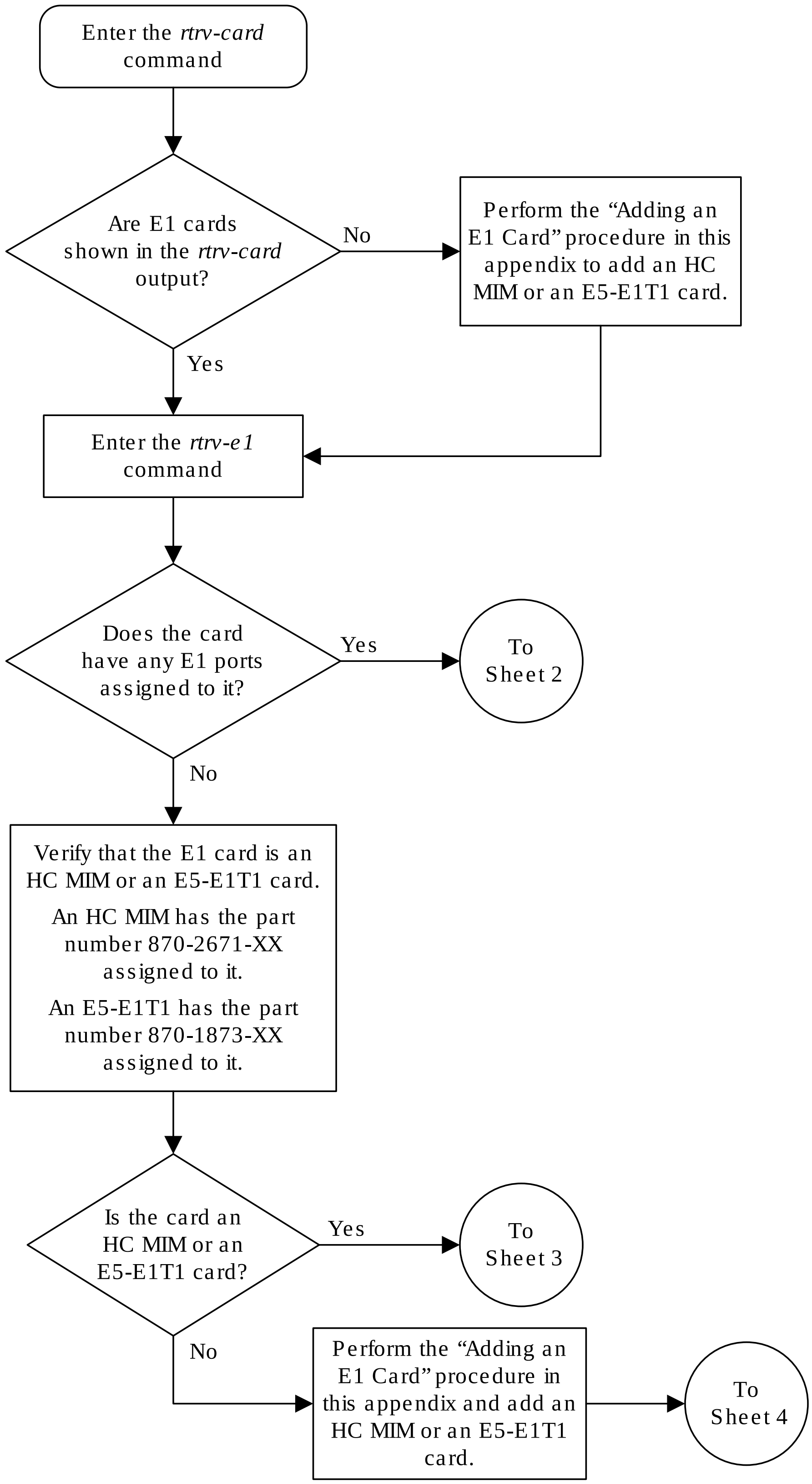
   ```
   rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
   ```

```
     E1                                                         LINK    MINSU
LOC  PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS   RATE
1301 1     OFF   OFF  HDB3    EXTERNAL  1   7   MASTER    CHAN    ----

TS0  (N/A)    TS8   ------   TS16  ------   TS24  ------
TS1  ------   TS9   ------   TS17  ------   TS25  ------
TS2  ------   TS10  ------   TS18  ------   TS26  ------
TS3  ------   TS11  ------   TS19  ------   TS27  ------
TS4  ------   TS12  ------   TS20  ------   TS28  ------
TS5  ------   TS13  ------   TS21  ------   TS29  ------
TS6  ------   TS14  ------   TS22  ------   TS30  ------
TS7  ------   TS15  ------   TS23  ------   TS31  ------

rtrv-e1:loc=1303:e1port=1


rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0

     E1                                                         LINK    MINSU
LOC  PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS   RATE
1303 1     ON    OFF  HDB3    RECOVERED 0   0   MASTER    CHAN    ----

TS0  (N/A)    TS8   ------   TS16  ------   TS24  ------
TS1  ------   TS9   ------   TS17  ------   TS25  ------
TS2  ------   TS10  ------   TS18  ------   TS26  ------
TS3  ------   TS11  ------   TS19  ------   TS27  ------
TS4  ------   TS12  ------   TS20  ------   TS28  ------
TS5  ------   TS13  ------   TS21  ------   TS29  ------
TS6  ------   TS14  ------   TS22  ------   TS30  ------
TS7  ------   TS15  ------   TS23  ------   TS31  ------
```

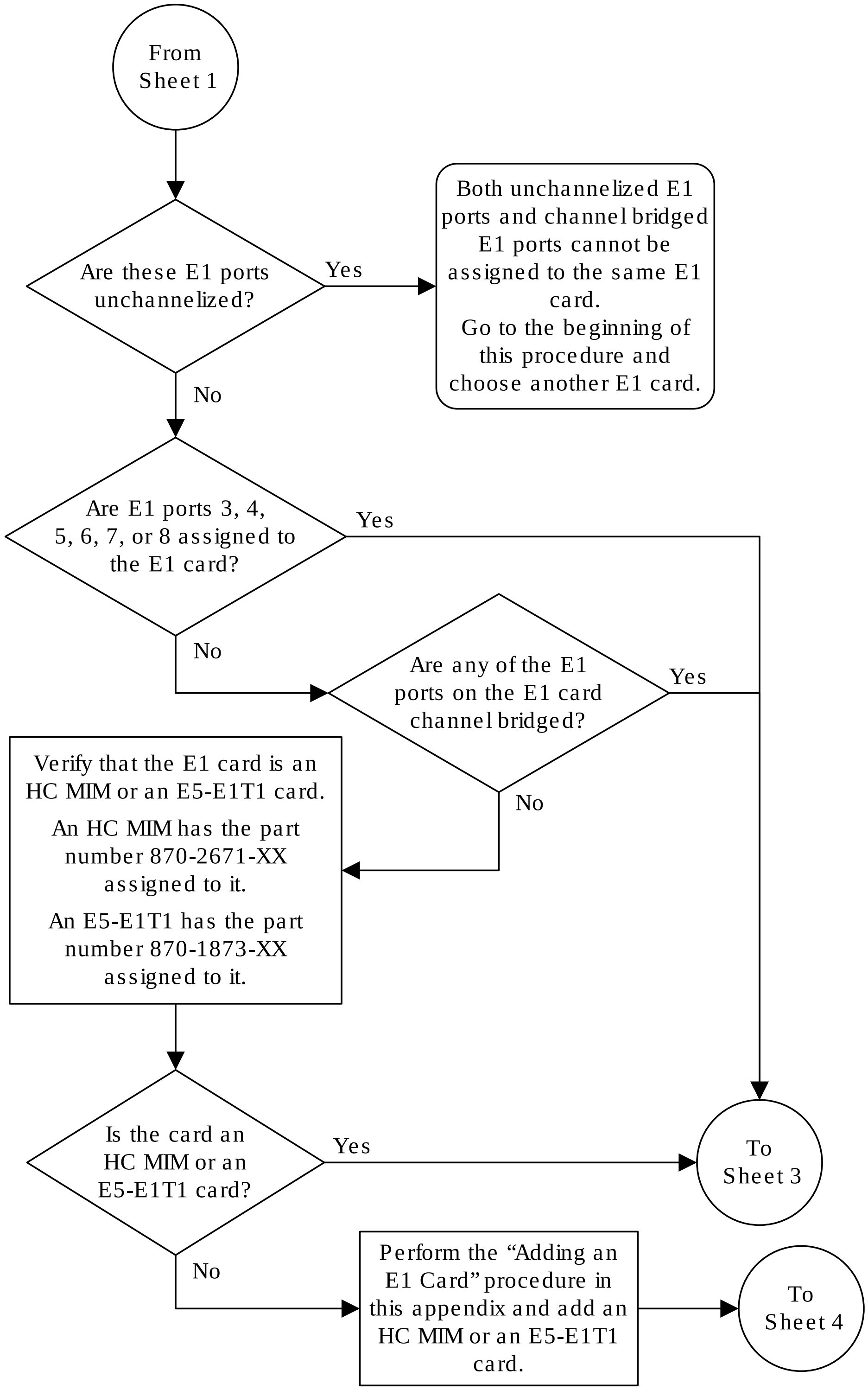
10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

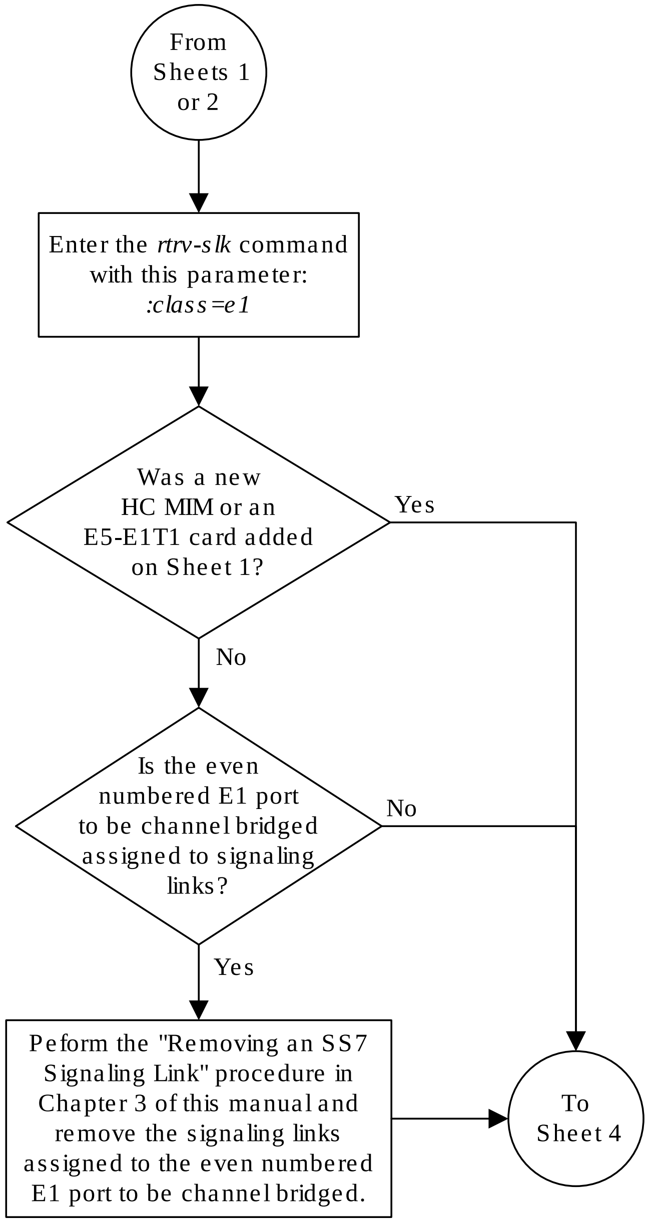
Figure A-7 Adding Channel Bridged E1 Ports



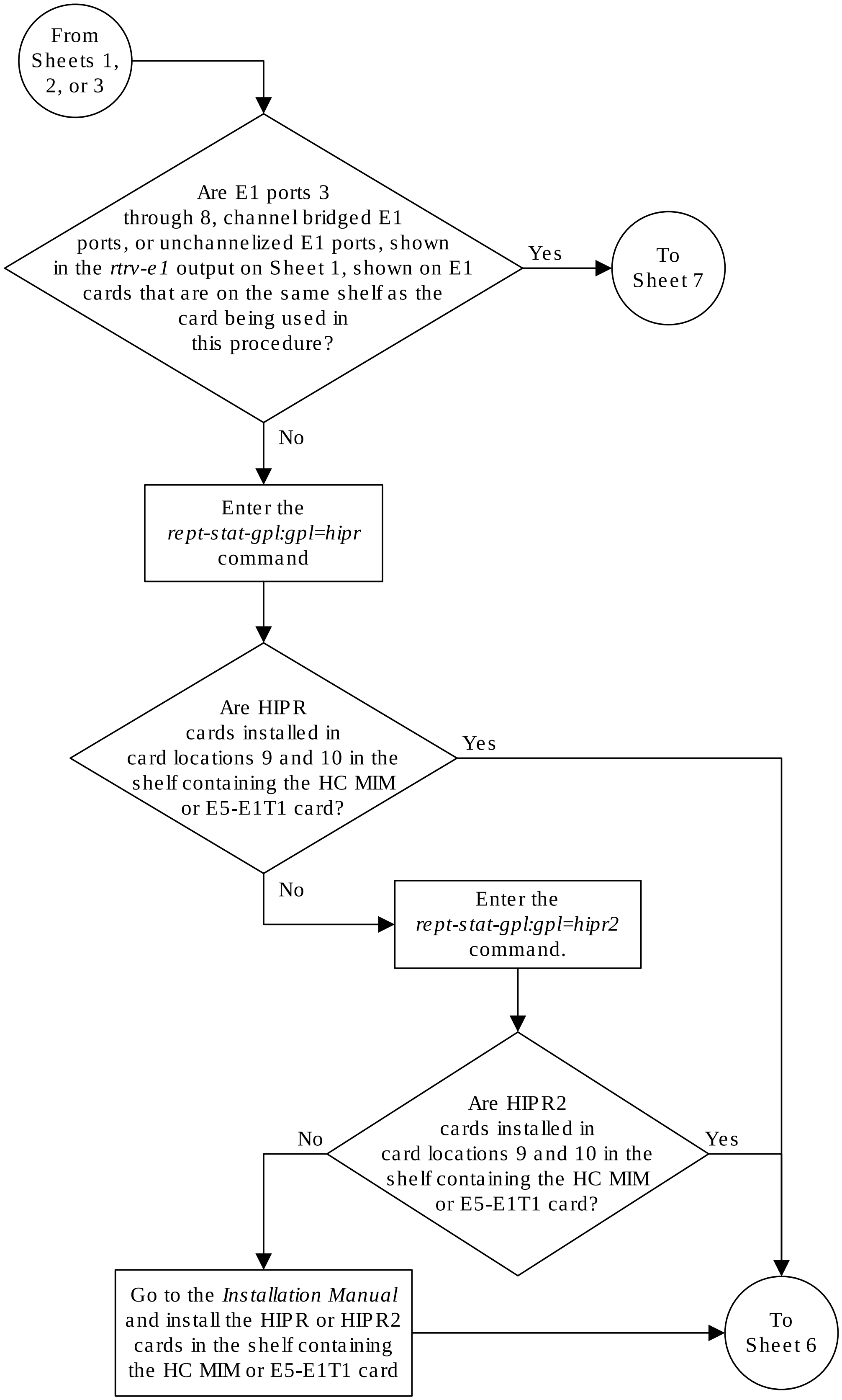
Sheet 1 of 6


From Sheet 1
Are these E1 ports unchannelized?
Yes
Both unchannelized E1 ports and channel bridged E1 ports cannot be assigned to the same E1 card.
Go to the beginning of this procedure and choose another E1 card.
No
Are E1 ports 3, 4, 5, 6, 7, or 8 assigned to the E1 card?
Yes
No
Are any of the E1 ports on the E1 card channel bridged?
Yes
No
Verify that the E1 card is an HC MIM or an E5-E1T1 card.
An HC MIM has the part number 870-2671-XX assigned to it.
An E5-E1T1 has the part number 870-1873-XX assigned to it.
Is the card an HC MIM or an E5-E1T1 card?
Yes
To Sheet 3
No
Perform the "Adding an E1 Card" procedure in this appendix and add an HC MIM or an E5-E1T1 card.
To Sheet 4

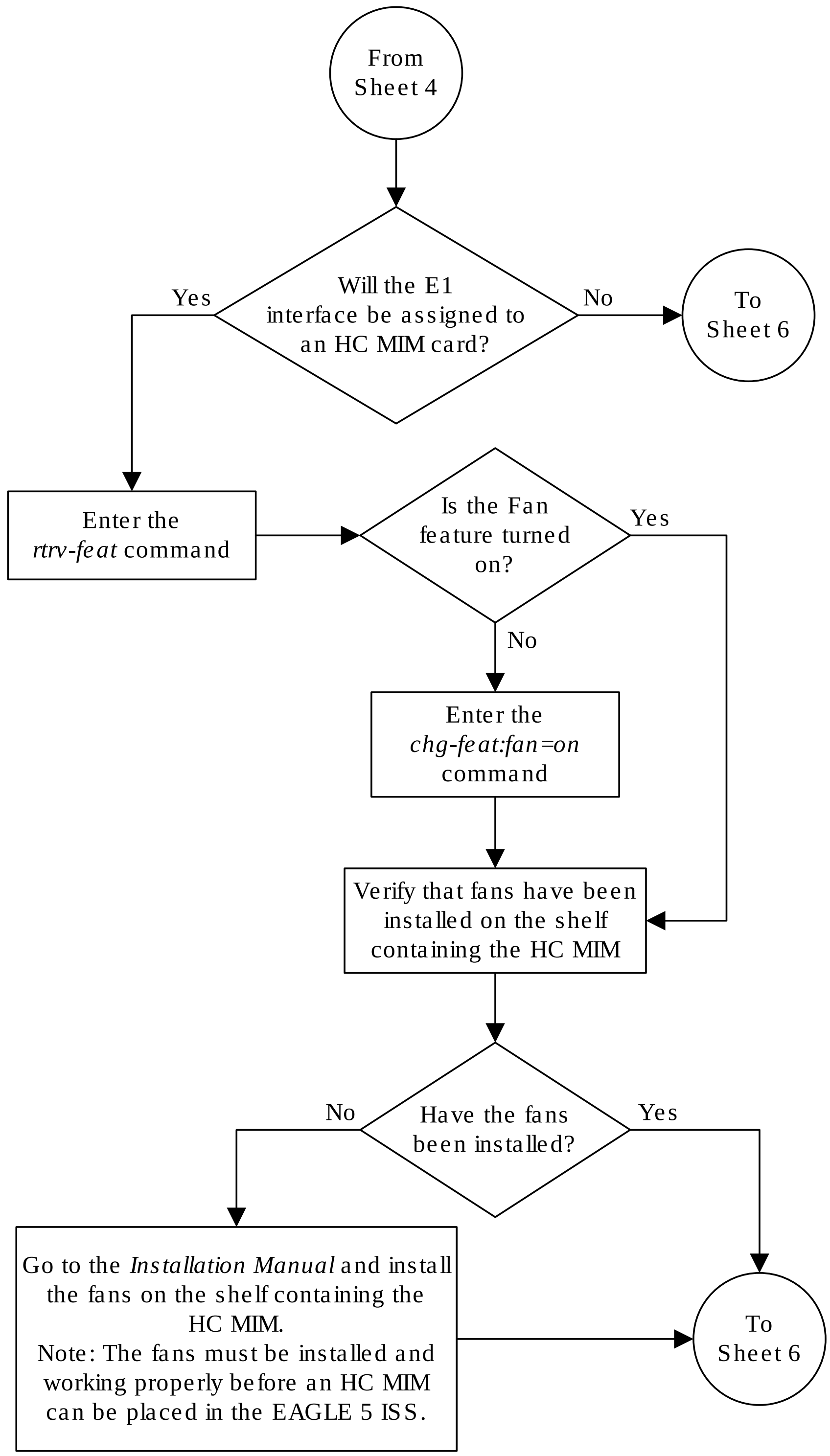
Sheet 2 of 6


From Sheets 1 or 2
Enter the rtrv-slk command with this parameter: :class=e1
Was a new HC MIM or an E5-E1T1 card added on Sheet 1?
Yes
No
Is the even numbered E1 port to be channel bridged assigned to signaling links?
No
Yes
Peform the "Removing an SS7 Signaling Link" procedure in Chapter 3 of this manual and remove the signaling links assigned to the even numbered E1 port to be channel bridged.
To Sheet 4

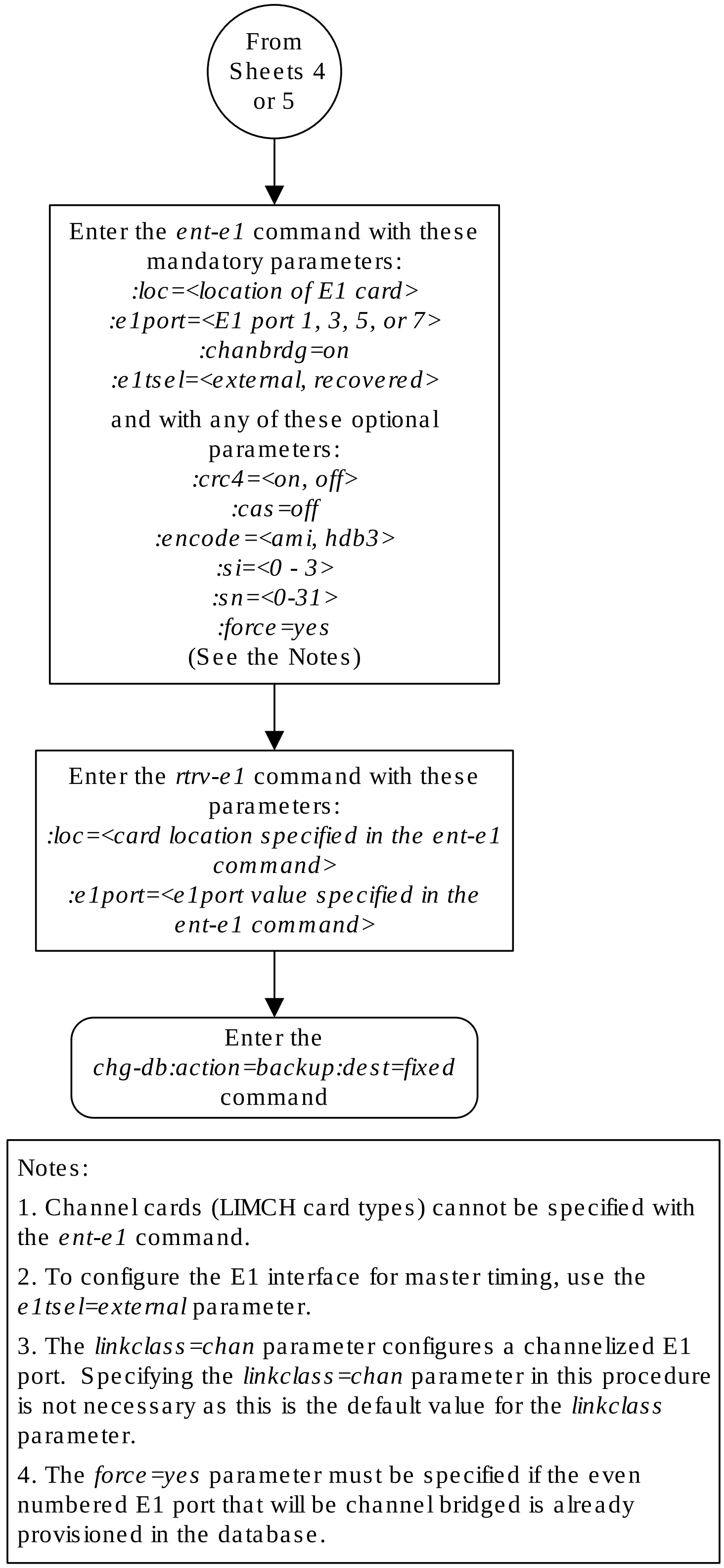
Sheet 3 of 6


From Sheets 1, 2, or 3
Are E1 ports 3 through 8, channel bridged E1 ports, or unchannelized E1 ports, shown in the *rtrv-e1* output on Sheet 1, shown on E1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 7
No
Enter the *rept-stat-gpl:gpl=hipr* command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the *rept-stat-gpl:gpl=hipr2* command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the *Installation Manual* and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 6

Sheet 4 of 6


From Sheet 4
Will the E1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 6
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 6

Sheet 5 of 6


From Sheets 4 or 5
Enter the ent-e1 command with these mandatory parameters:
:loc=<location of E1 card>
:e1port=<E1 port 1, 3, 5, or 7>
:chanbrdg=on
:e1tsel=<external, recovered>
and with any of these optional parameters:
:crc4=<on, off>
:cas=off
:encode=<ami, hdb3>
:si=<0 - 3>
:sn=<0-31>
:force=yes
(See the Notes)
Enter the rtrv-e1 command with these parameters:
:loc=<card location specified in the ent-e1 command>
:e1port=<e1port value specified in the ent-e1 command>
Enter the chg-db:action=backup:dest=fixed command
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the ent-e1 command.
2. To configure the E1 interface for master timing, use the e1tsel=external parameter.
3. The linkclass=chan parameter configures a channelized E1 port. Specifying the linkclass=chan parameter in this procedure is not necessary as this is the default value for the linkclass parameter.
4. The force=yes parameter must be specified if the even numbered E1 port that will be channel bridged is already provisioned in the database.

Sheet 6 of 6

A.8 Adding Unchannelized E1 Ports

The **E1** interface parameters are provisioned in the database using the `ent-e1` command using these parameters.

`:loc` – The location of the **E1** card (card type `lime1`) that is servicing the **E1** signaling link. The **E1** card must be an **HC-MIM** or an **E5-E1T1** card. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:e1port` – The **E1** port on the **E1** card used to service the **E1** signaling link. The `e1port` value cannot already be assigned to the **E1** card specified by the `loc` parameter.

`:crc4` – Specifies whether or not **CRC4** is enabled on the **E1** signaling link. The default value is `on` (`crc4=on`).

`:cas` – Specifies whether **CAS** or **CCS** is used on the **E1** signaling link. **CAS** is enabled with the `cas=on` parameter. **CCS** is enabled with the `cas=off` parameter. The default value is **CCS** enabled (`cas=off`). The `cas=on` parameter cannot be specified for an **HC-MIM** or an **E5-E1T1** card.

`:encode` – Specifies the type of encoding or decoding that is used on the **E1** signaling link, either **HDB3** or **AMI**. The default value is **HDB3** encoding (`encode=hdb3`).

`:e1tsel` – The timing source for the **E1** signaling link, master (`external`) or slave (`line`). The default value is slave timing (`e1tsel=line`).

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3. The default value is 0 (`si=0`).

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31. The default value is 0 (`sn=0`).

`:linkclass` – Indicates whether the **E1** port supports channelized (`linkclass=chan`) or un-channelized (`linkclass=unchan`) **E1** signaling links.

`:minsurate` – Specifies the minimum number of signaling units (**FISUs** and **LSSU**s) per second that are transmitted on the outbound **E1** signaling link during idle periods or when there is an unused portion of the link's bandwidth. The value of this parameter is from 500 to 2000 signaling units per second, with the default value of 1000 signaling units per second. The `minsurate` parameter can be specified only when an unchannelized **E1** port (`linkclass=unchan` parameter) is being configured.

The `ent-e1` command contains the `e1tsel=recovered`, `chanbrdg`, and `force=yes` parameters. These parameters are not used in this procedure. These parameters and their usage are described in Adding Channel Bridged E1 Ports.

The **E1** card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

1. Display the cards in the **EAGLE** 5 **ISS** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIME1     CCS7ITU  lsn1        A    13  lsn1        B    12
1202   LIMCH     CCS7ITU  lsn1        A    0   lsn1        B    8
1203   LIME1     CCS7ITU  lsn1        A1   4   lsn1        B1   9
1204   LIMCH     CCS7ITU  lsn1        A2   5   lsn1        A3   6
1211   LIME1     CCS7ITU  lsn1        A    14
1212   LIMCH     CCS7ITU  lsn1        A    10  lsn1        B    11
1213   LIME1     CCS7ITU  lsn1        A4   1   lsn1        A5   7
                          lsn1        B5   2   lsn1        A6   3
```

   If there no **LIME1** cards shown in the `rtrv-card` output, perform Adding a LIM-E1 Card and add an **HC-MIM** or an **E5-E1T1** card to the database. After the card has been added, continue the procedure with 2.

2. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters.

   This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
      E1                                                     LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  1     ON    OFF  HDB3    EXTERNAL  2   6   ------    CHAN
----
1201  2     ON    OFF  HDB3    EXTERNAL  3   5   ------    CHAN
----
1202  1     ON    OFF  HDB3    EXTERNAL  1   10  ------    CHAN
----
1203  1     ON    OFF  HDB3    EXTERNAL  1   11  ------    CHAN
----
1203  2     ON    OFF  HDB3    EXTERNAL  3   7   ------    CHAN
----
1204  1     ON    OFF  HDB3    EXTERNAL  3   8   ------    CHAN
----
1211  2     ON    OFF  HDB3    EXTERNAL  0   0   ------    CHAN
```

```
----
1212  1      ON     OFF  HDB3    EXTERNAL  1   1   ------    CHAN     ----
1213  1      ON     OFF  HDB3    EXTERNAL  2   2   ------    CHAN     ----
1213  5      ON     OFF  HDB3    EXTERNAL  3   3   ------    CHAN     ----
```

Table A-11 shows the maximum number of unchannelized E1 ports that the EAGLE can contain. If the `rtrv-e1` output contains the maximum number of unchannelized **E1** ports, no other unchannelized **E1** ports can be added and this procedure cannot be performed.

If no **E1** ports are assigned to the **E1** card you wish to use in this procedure, verify that the **E1** card is an **HC**-**MIM** or an **E5-E1T1** card. The part number of the **HC**-**MIM** is 870-2671-**XX**. The part number of the **E5-E1T1** card is 870-1873-**XX** If the **E1** card is not an **HC**-**MIM** or an **E5-E1T1** card, either select another **E1** card from the `rtrv-e1` output, or add a new **HC**-**MIM** by performing Adding a LIM-E1 Card.

If the **E1** card is an **HC**-**MIM** or an **E5-E1T1** card, and contains no unchannelized **E1** ports, continue the procedure with 3.

If **E1** ports are assigned to the **E1** card you wish to use in this procedure, and the **E1** ports on the **E1** card are channelized, unchannelized **E1** ports cannot be assigned to this **E1** card. **Unchannelized E1** ports cannot be assigned to an **E1** card that contains channelized **E1** ports. If the **E1** ports on the **E1** card are channelized, either select another **E1** card from the `rtrv-e1` output, or add a new **HC**-**MIM** or an **E5-E1T1** card by performing Adding a LIM-E1 Card. If all the **E1** ports shown in the `rtrv-e1` output are channelized, add a new **HC**-**MIM** or an **E5-E1T1** card by performing Adding a LIM-E1 Card.

An **HC**-**MIM** can contain a maximum of two unchannelized **E1** ports. An **E5-E1T1** card can contain only one unchannelized **E1** port. If the **E1** card you wish to use contains two unchannelized **E1** ports, the **E1** card is an **HC**-**MIM**. No additional unchannelized **E1** port cannot be added to this **E1** card. If the **E1** card you wish to use contains one unchannelized **E1** port, verify that the **E1** card is an **HC**-**MIM** or an **E5-E1T1** card. The part number of the **HC**-**MIM** is 870-2671-**XX**. The part number of the **E5-E1T1** card is 870-1873-**XX**. If the **E1** card is an **HC**-**MIM** with only one unchannelized **E1** port assigned, the unchannelized **E1** port can be added to this card. Continue the procedure with 3. If the **E1** card is an **E5-E1T1** card, the unchannelized **E1** port cannot be added to this **E1** card.

If the unchannelized **E1** port cannot be added to this card, repeat 1 and 2 to select another **E1** card to add the unchannelized **E1** port to, or add a new **HC**-**MIM** or **E5-E1T1** by performing Adding a LIM-E1 Card.

3. Display the status of the SE-HSL SLK Capacity feature by entering the `rtrv-ctrl-feat` command.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
HC-MIM SLK Capacity       893012707  on      64
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      400000
XMAP Table Expansion      893007701  on      3000
```

```
The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

Continue the procedure by performing one of these substeps.

a. If an **SE-HSLSLK** quantity is not enabled, continue the procedure with 4.

> **Note:**
>
> If the `rtrv-ctrl-feat` output in this step shows any controlled features, continue the procedure with 8. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 4 through 7 must be performed.

b. If an SE-HSL SLK quantity is enabled, the entry `SE-HSL SLK Capacity` is shown in the `rtrv-ctrl-feat` output with one of the quantities shown in Table A-11. This quantity is the number of unchannelized E1 signaling links, and the number of unchannelized E1 ports, the EAGLE can contain. If the addition of the unchannelized E1 port in this procedure will not exceed the enabled SE-HSL SLK quantity, continue the procedure by performing one of these steps.

   - If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are on the same shelf as the card that will contain the E1 port that is being added, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure with 14.
   - If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are not on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 10.
   - If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are on the same shelf as the card that will contain the E1 port that is being added, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 10.

c. If an SE-HSL SLK quantity is enabled, and the addition of the unchannelized E1 port in this procedure will exceed the enabled SE-HSL SLK quantity, increase the enabled SE-HSL SLK quantity by performing 8.

4. Display the serial number in the database with the `rtrv-serial-num` command.

```
rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
System serial number = nt00001231
```

```
System serial number is not locked, yet.
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with 8. If the serial number is correct but not locked, continue the procedure with 7. If the serial number is not correct, but is locked, the SE-HSL SLK quantity cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

5. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's correct serial number>`

6. Verify that the serial number entered in 5 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   System serial number = nt00001231

   System serial number is not locked, yet.
   ```

   If the serial number was not entered correctly, repeat 4 and 5 and re-enter the correct serial number.

7. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 4 , if the serial number shown in 4 is correct, or with the serial number shown in 6 , if the serial number was changed in 5 , and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

8. Enable the SE-HSL SLK quantity by entering the `enable-ctrl-feat` command specifying the part number for the desired SE-HSL SLK quantity and the feature access key.

   The SE-HSL SLK quantity part numbers are shown in Table A-11.

Table A-11 SE-HSL SLK QuantityPart Numbers

SE-HSL SLK Quantity	Part Number
4	893013001

Table A-11 (Cont.) SE-HSL SLK QuantityPart Numbers

SE-HSL SLK Quantity	Part Number
8	893013002
16	893013003
24	893013004
32	893013005
40	893013006
48	893013007
56	893013008
64	893013009
72	893013010
80	893013011
88	893013012
96	893013013
104	893013014
112	893013015
120	893013016

For this example, enter this command.

```
enable-ctrl-feat:partnum=893013001:fak=<feature access key>
```

> **Note:**
>
> A temporary feature access key cannot be specified to enable the unchannelized **E1** signaling link quantity.

> **Note:**
>
> The value for the feature access key (the `fak` parameter) is provided by Oracle. If you do not have the feature access key for the unchannelized **E1** signaling link quantity, contact your Oracle Sales Representative or Account Representative.

9. Verify the changes by entering the `rtrv-ctrl-feat`command with the unchannelized **E1** signaling link quantity (SE-HSL**SLK** Capacity feature) part number specified in 8 .

   Enter this command.

   ```
   rtrv-ctrl-feat:partnum=893013001
   ```

   ```
   rlghncxa03w 06-10-28 21:15:37 GMT EAGLE5 36.0.0
   The following features have been permanently enabled:
   ```

```
Feature Name              Partnum   Status Quantity
SE-HSL SLK Capacity       893013001 on     4

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

Continue the procedure by performing one of these steps.

- If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are on the same shelf as the card that will contain the E1 port that is being added, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure with 14.
- If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are not on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 10.
- If E1 cards are shown in the `rtrv-e1` output in 2 and these cards are on the same shelf as the card that will contain the E1 port that is being added, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 10.

10. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the E1 port being added in this procedure by entering this command.

    `rept-stat-gpl:gpl=hipr2`

    This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD      RUNNING          APPROVED      TRIAL
HIPR2       1109      126-002-000      126-002-000   126-003-000
HIPR2       1110      126-002-000      126-002-000   126-003-000
HIPR2       1209      126-002-000      126-002-000   126-003-000
HIPR2       1210      126-002-000      126-002-000   126-003-000
HIPR2       1309      126-002-000      126-002-000   126-003-000
HIPR2       1310      126-002-000      126-002-000   126-003-000
HIPR2       2109      126-002-000      126-002-000   126-003-000
HIPR2       2110      126-002-000      126-002-000   126-003-000
Command Completed
```

If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 14.
- If the card is an HC MIM, continue the procedure with 11.

If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 14.
- If the card is an HC MIM, continue the procedure with 11.

11. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the Fan feature is on, continue the procedure with 14.

If the Fan feature is off, continue the procedure with Oracle.

12. Turn the Fan feature on by entering this command.

```
chg-feat:fan=on
```

> **Note:**
>
> Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 09-05-28 11:43:04 GMT EAGLE5 41.0.0
CHG-FEAT: MASP A - COMPLTD
```

13. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

If the fans are installed, continue the procedure with 14.

If the fans are not installed on the shelf containing the HC-MIM, go to *Installation Guide* and install the fans. After the fans have been installed and tested, continue the procedure with 14.

14. Add the unchannelized **E1** port to the database using the `ent-e1` command and the parameter combinations shown in Table A-12.

Table A-12 Unchannelized E1 Port Parameter Combinations

Mandatory Parameters		
:loc=card location of the **HC-MIM** or an **E5-E1T1** card	:linkclass=unchan	:e1port=1, 2, 3, 4, 5, 6, 7, 8
Optional Parameters		
:cas=off Default value = off	:crc4=on, off Default value = on	:e1tsel=line, external Default value = line
:encode=ami, hdb3 Default value = hdb3	:si=0 - 3 Default value = 0	:sn=0 - 31 Default value = 0
:minsurate=500 - 2000 Default value = 1000		

For this example, enter these commands.

```
ent-e1:loc=1305:e1port=2:encode=hdb3:e1tsel=line:si=1:sn=7 :linkclass=unchan
```

```
ent-e1:loc=1307:e1port=2:crc4=on:encode=hdb3:e1tsel=external :linkclass=unchan
```

15. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 14 .

    For this example, enter these commands.

```
rtrv-e1:loc=1305:e1port=2


rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
      E1                                                   LINK    MINSU
LOC   PORT   CRC4   CAS   ENCODE   E1TSEL     SI   SN   CHANBRDG   CLASS   RATE
1305  2      OFF    OFF   HDB3     LINE       1    7    ------     UNCHAN  1000
```

```
rtrv-e1:loc=1307:e1port=2


rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
      E1                                                   LINK    MINSU
LOC   PORT   CRC4   CAS   ENCODE   E1TSEL     SI   SN   CHANBRDG   CLASS   RATE
1307  2      ON     OFF   HDB3     EXTERNAL   0    0    ------     UNCHAN  1000
```

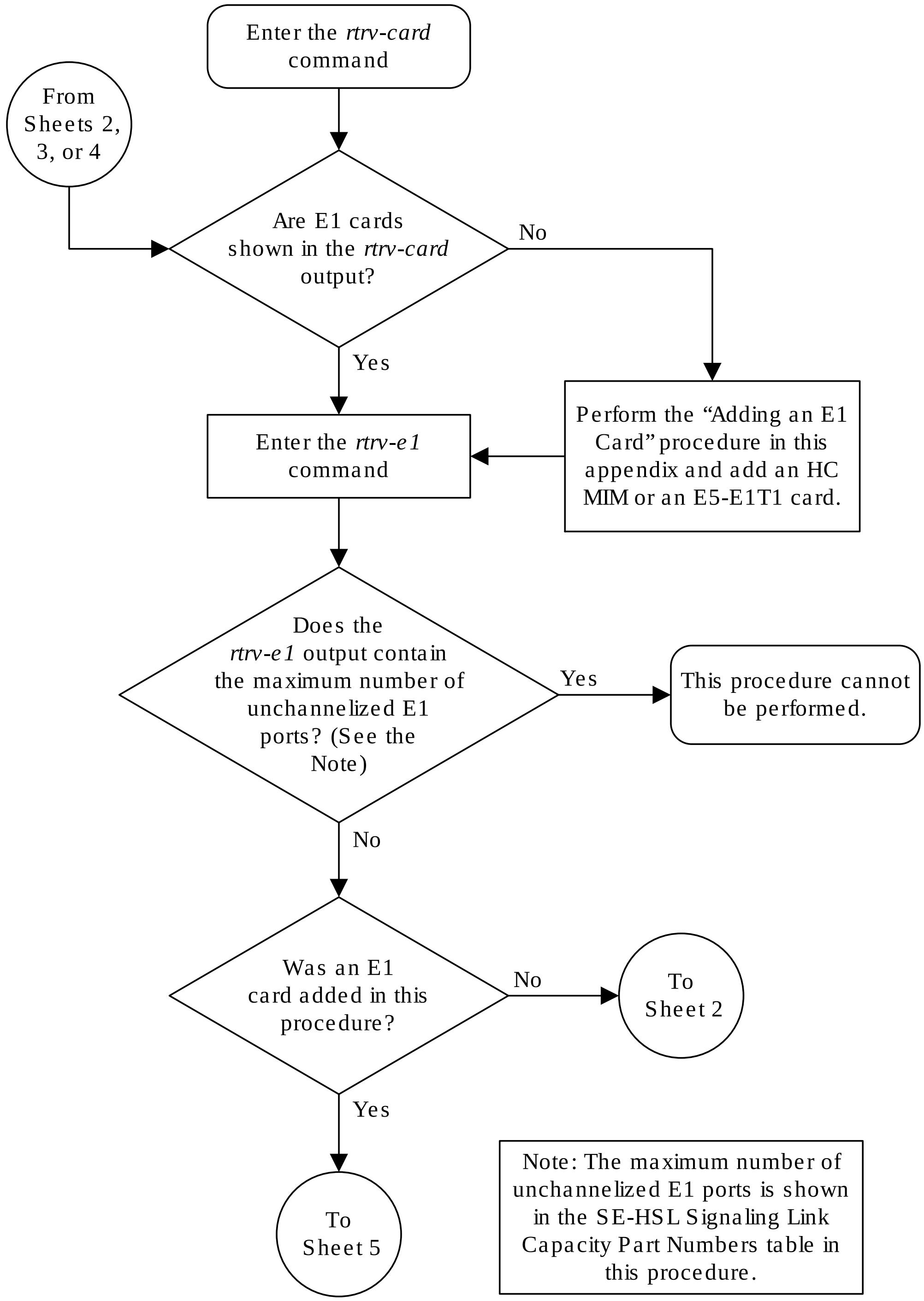
16. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

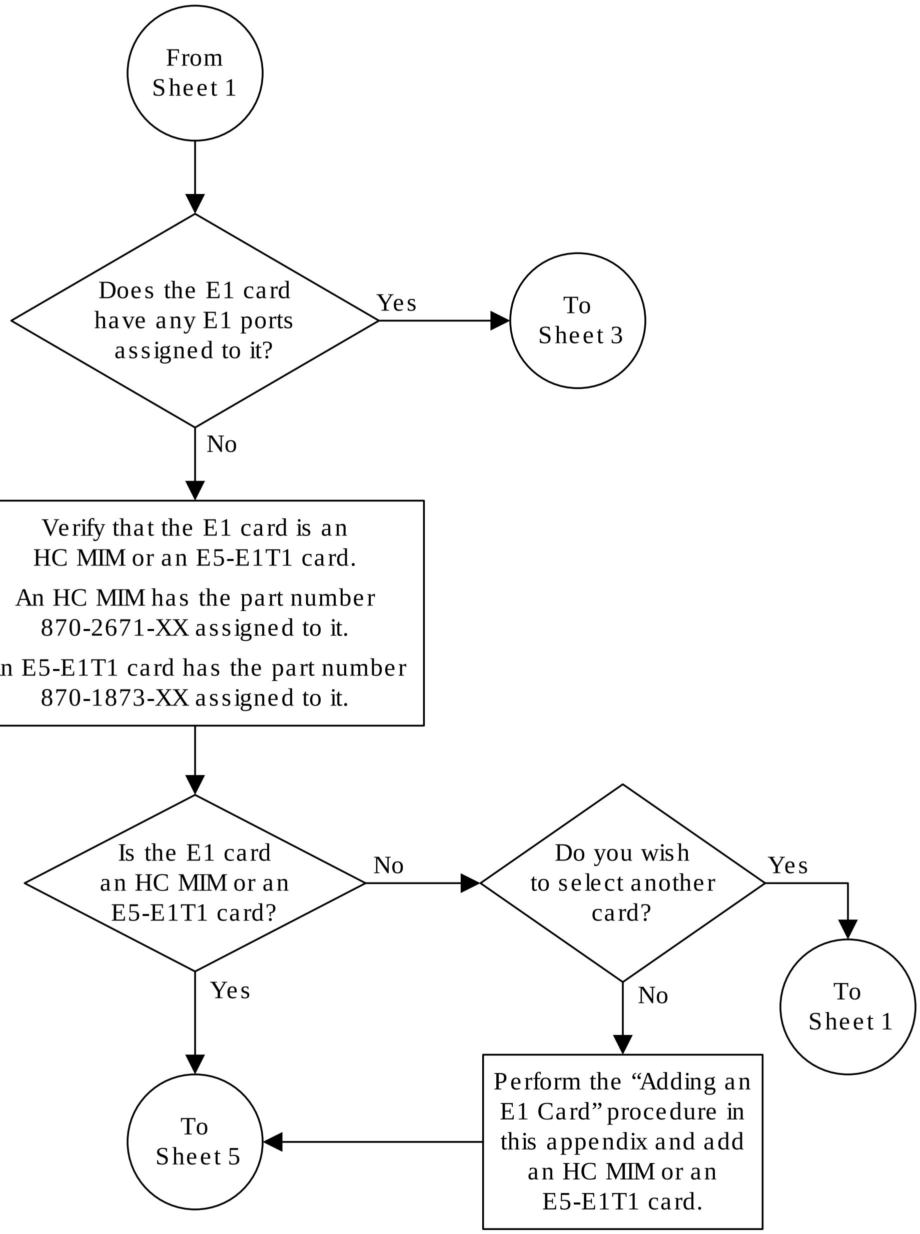
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
```

```
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

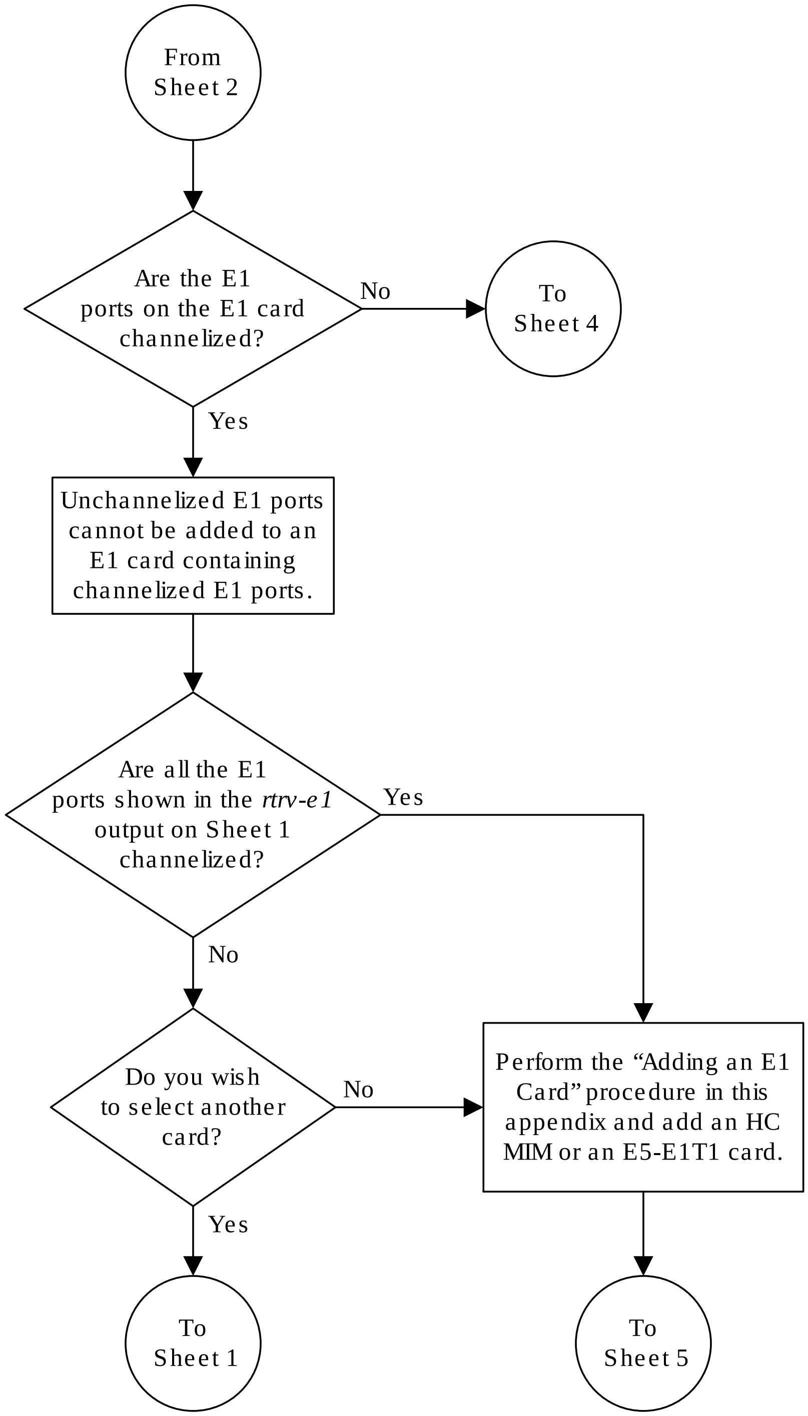
Figure A-8 Adding Unchannelized E1 Ports



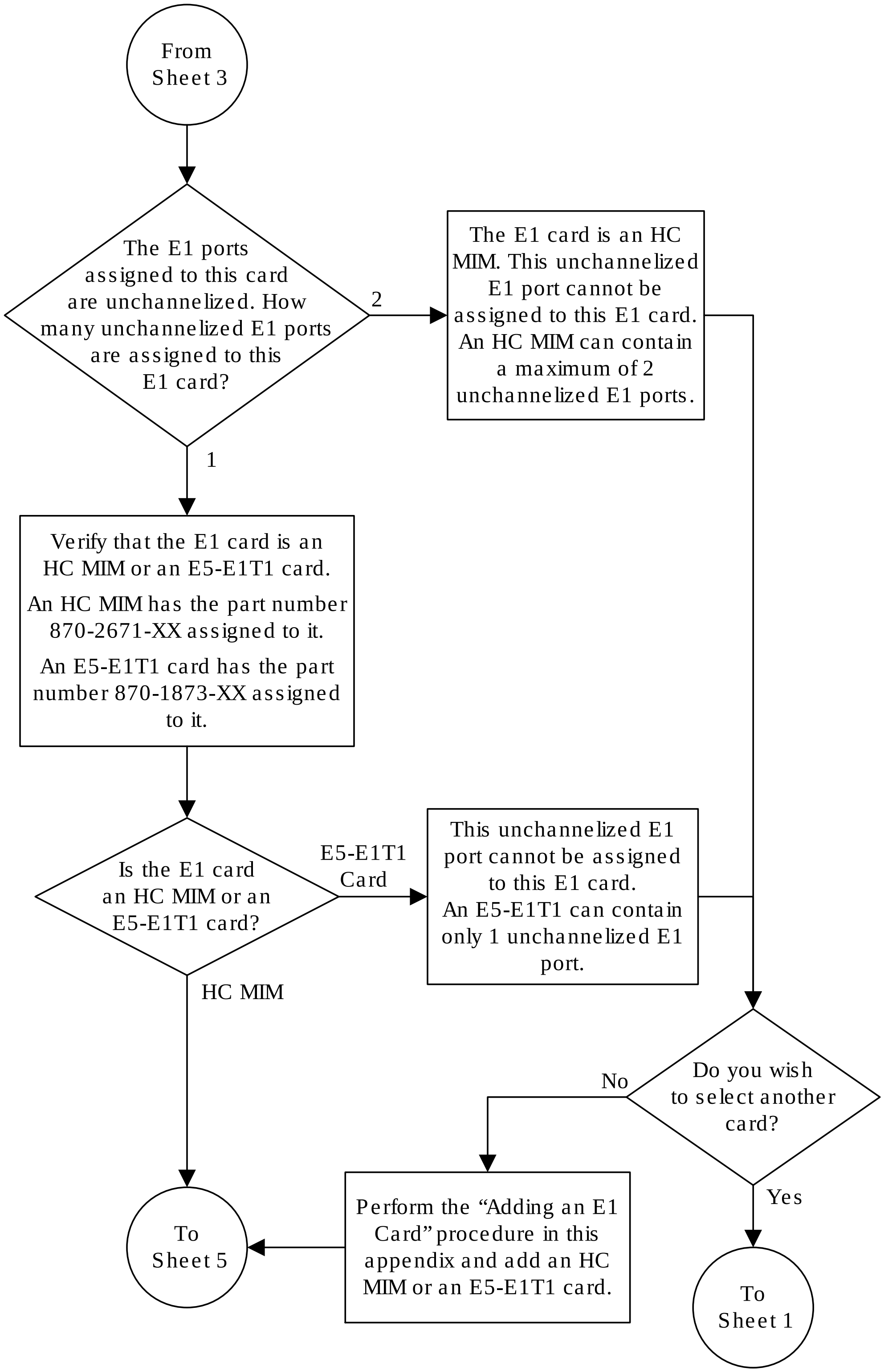
Sheet 1 of 10


From Sheet 1
Does the E1 card have any E1 ports assigned to it?
Yes
To Sheet 3
No
Verify that the E1 card is an HC MIM or an E5-E1T1 card.
An HC MIM has the part number 870-2671-XX assigned to it.
An E5-E1T1 card has the part number 870-1873-XX assigned to it.
Is the E1 card an HC MIM or an E5-E1T1 card?
No
Do you wish to select another card?
Yes
To Sheet 1
Yes
No
Perform the “Adding an E1 Card” procedure in this appendix and add an HC MIM or an E5-E1T1 card.
To Sheet 5

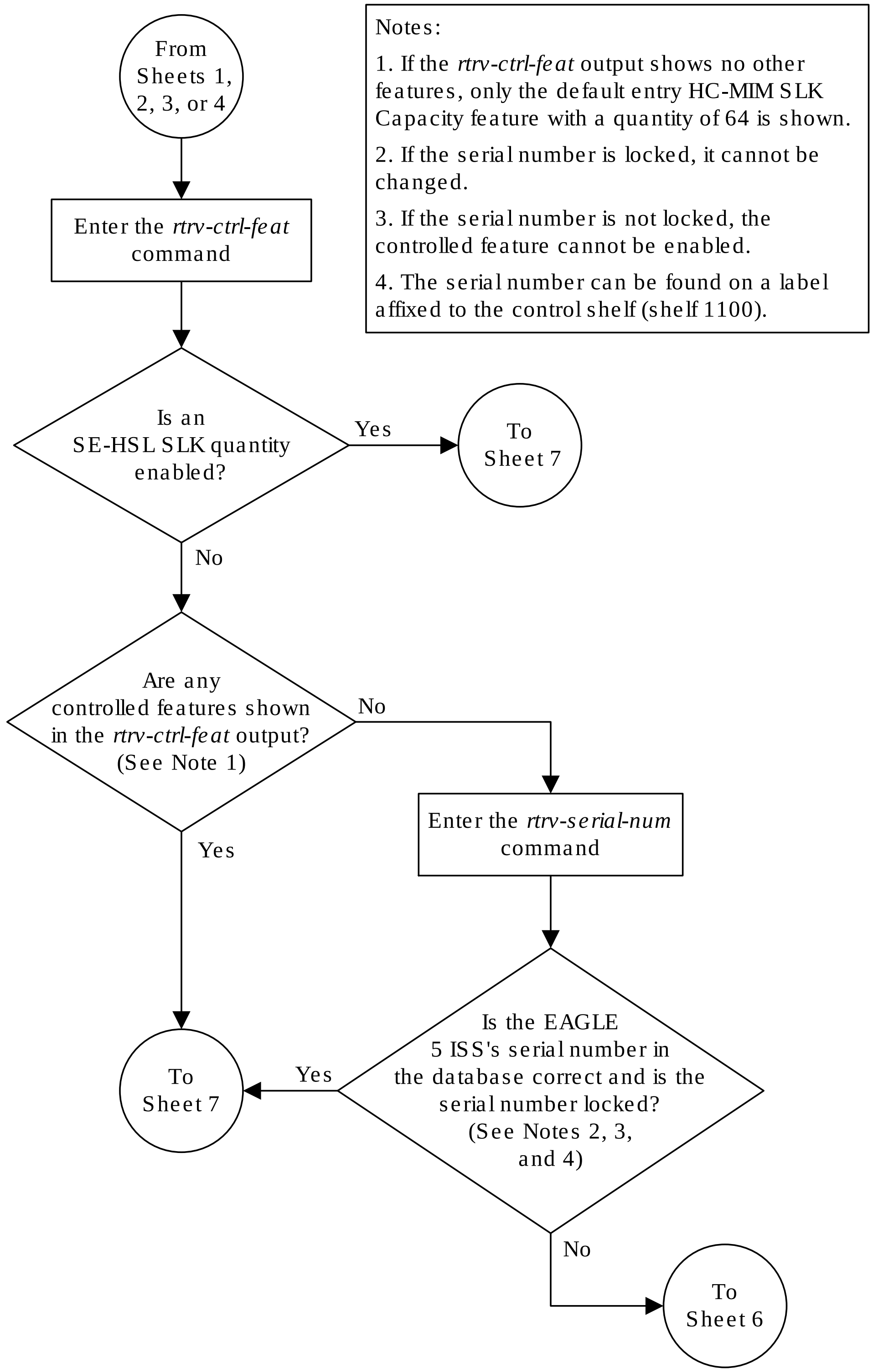
Sheet 2 of 10


From Sheet 2
Are the E1 ports on the E1 card channelized?
No
To Sheet 4
Yes
Unchannelized E1 ports cannot be added to an E1 card containing channelized E1 ports.
Are all the E1 ports shown in the *rtrv-e1* output on Sheet 1 channelized?
Yes
No
Do you wish to select another card?
No
Perform the "Adding an E1 Card" procedure in this appendix and add an HC MIM or an E5-E1T1 card.
Yes
To Sheet 1
To Sheet 5

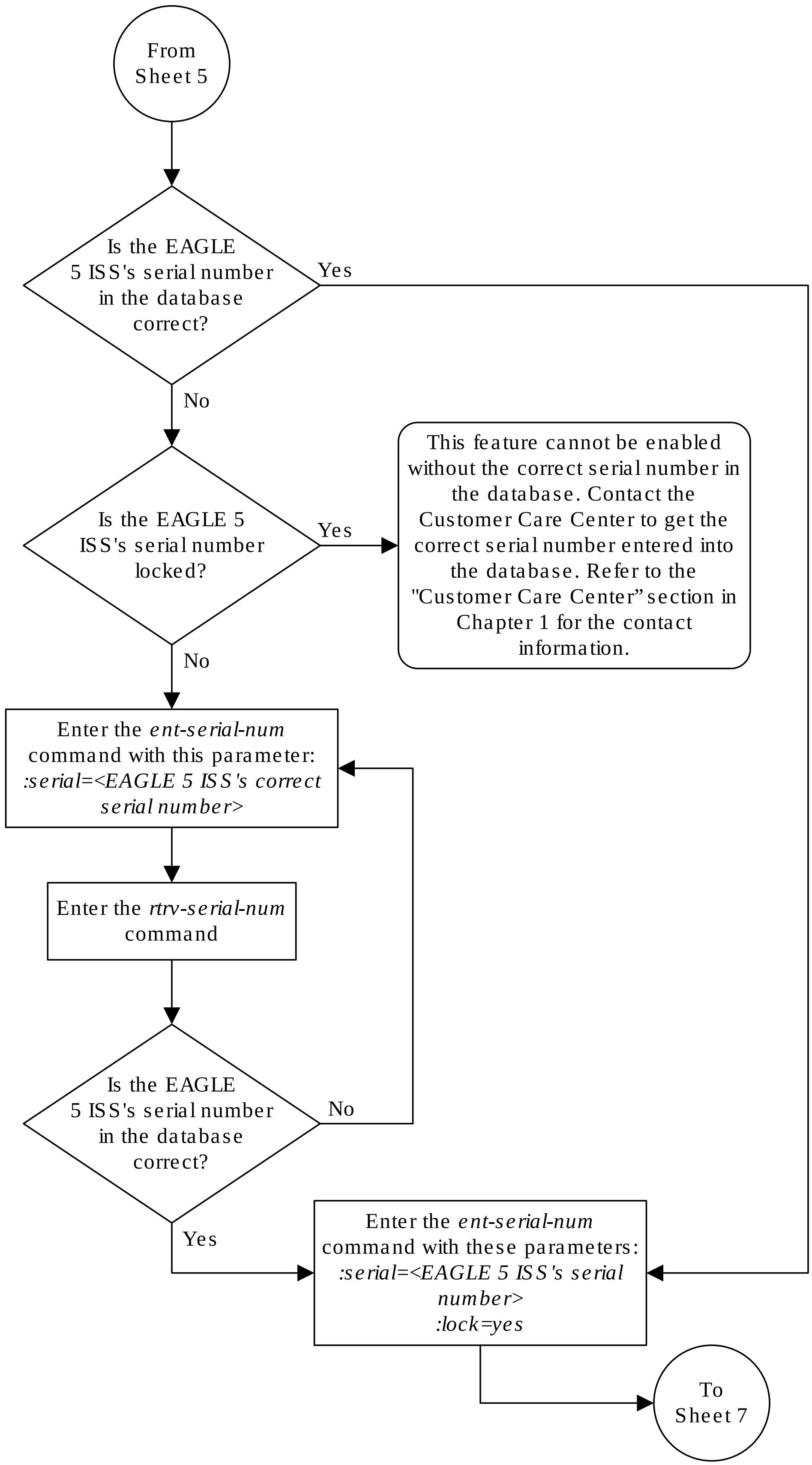
Sheet 3 of 10


From Sheet 3
The E1 ports assigned to this card are unchannelized. How many unchannelized E1 ports are assigned to this E1 card?
2
The E1 card is an HC MIM. This unchannelized E1 port cannot be assigned to this E1 card. An HC MIM can contain a maximum of 2 unchannelized E1 ports.
1
Verify that the E1 card is an HC MIM or an E5-E1T1 card.
An HC MIM has the part number 870-2671-XX assigned to it.
An E5-E1T1 card has the part number 870-1873-XX assigned to it.
Is the E1 card an HC MIM or an E5-E1T1 card?
E5-E1T1 Card
This unchannelized E1 port cannot be assigned to this E1 card. An E5-E1T1 can contain only 1 unchannelized E1 port.
HC MIM
Do you wish to select another card?
No
Yes
Perform the "Adding an E1 Card" procedure in this appendix and add an HC MIM or an E5-E1T1 card.
To Sheet 5
To Sheet 1

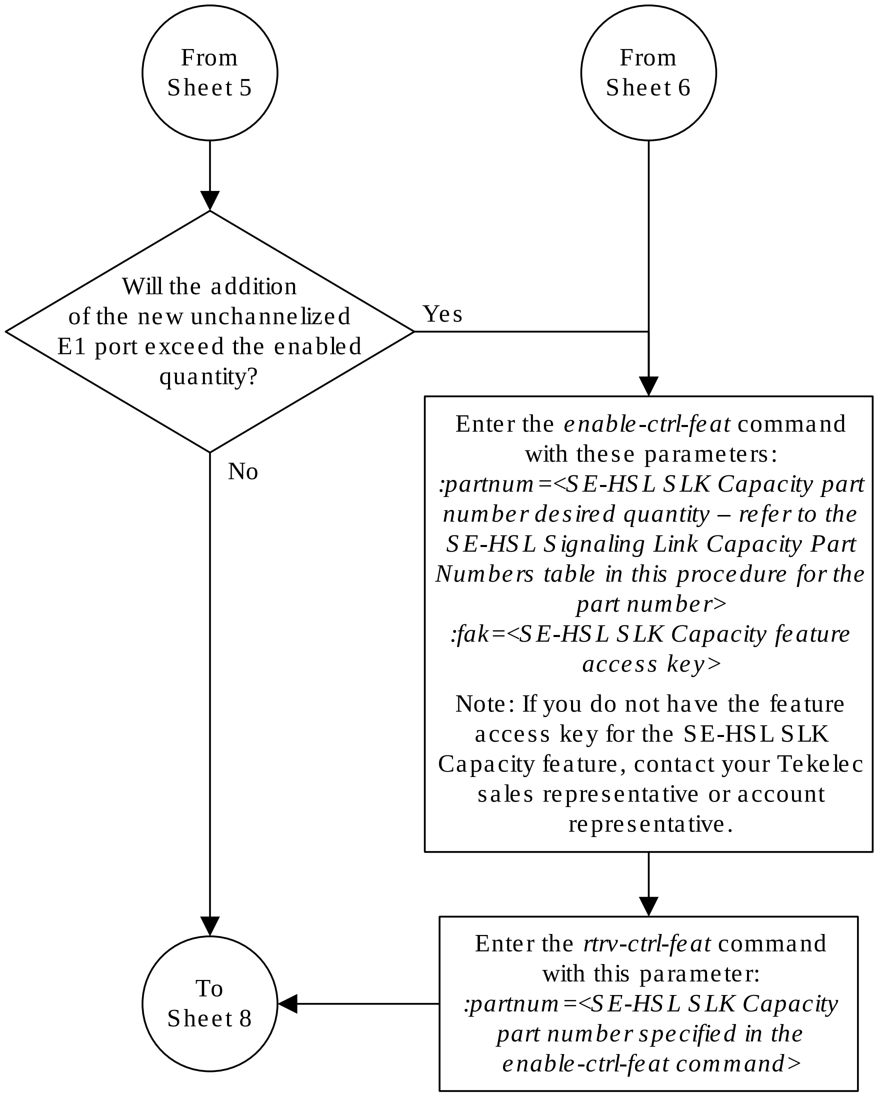
Sheet 4 of 10


Notes:
1. If the rtrv-ctrl-feat output shows no other features, only the default entry HC-MIM SLK Capacity feature with a quantity of 64 is shown.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).
From Sheets 1, 2, 3, or 4
Enter the rtrv-ctrl-feat command
Is an SE-HSL SLK quantity enabled?
Yes
To Sheet 7
No
Are any controlled features shown in the rtrv-ctrl-feat output? (See Note 1)
No
Enter the rtrv-serial-num command
Yes
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
Yes
To Sheet 7
No
To Sheet 6

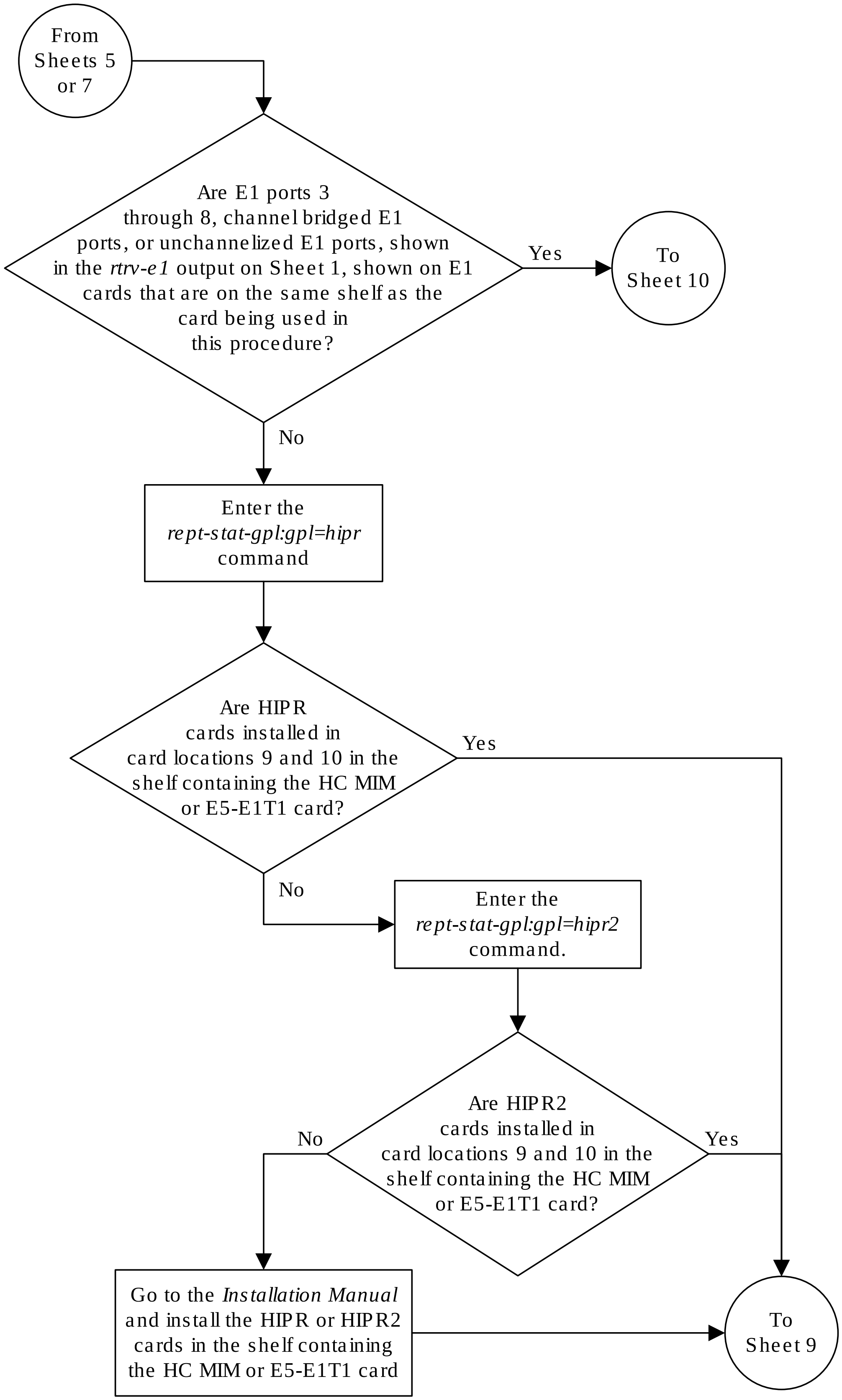
Sheet 5 of 10


From Sheet 5
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the *ent-serial-num* command with this parameter: *:serial=<EAGLE 5 ISS's correct serial number>*
Enter the *rtrv-serial-num* command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the *ent-serial-num* command with these parameters: *:serial=<EAGLE 5 ISS's serial number>* *:lock=yes*
To Sheet 7

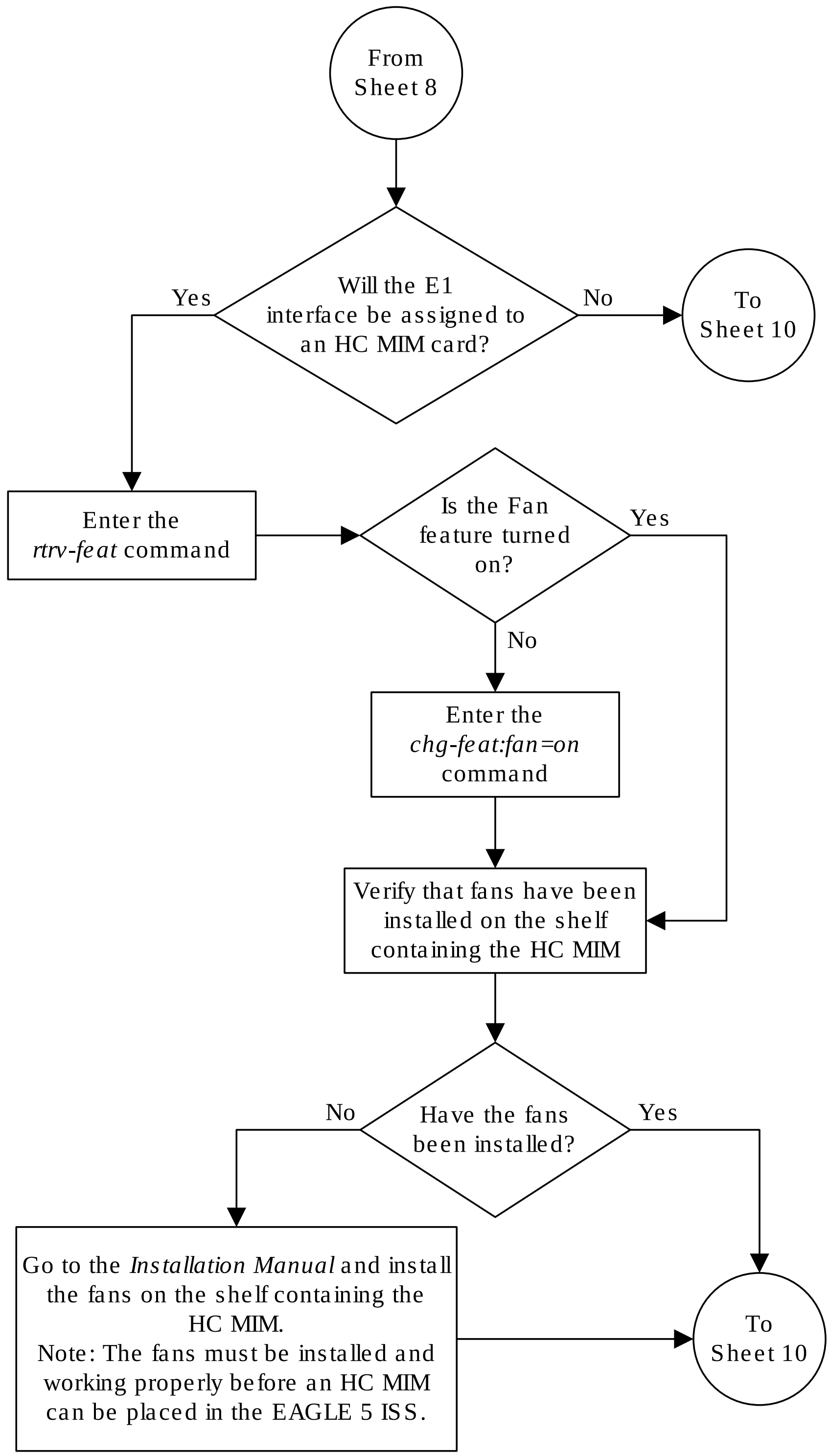
Sheet 6 of 10


From
Sheet 5
From
Sheet 6
Will the addition
of the new unchannelized
E1 port exceed the enabled
quantity?
Yes
No
Enter the *enable-ctrl-feat* command
with these parameters:
:partnum=<SE-HSL SLK Capacity part number desired quantity – refer to the SE-HSL Signaling Link Capacity Part Numbers table in this procedure for the part number>
:fak=<SE-HSL SLK Capacity feature access key>
Note: If you do not have the feature access key for the SE-HSL SLK Capacity feature, contact your Tekelec sales representative or account representative.
Enter the *rtrv-ctrl-feat* command
with this parameter:
:partnum=<SE-HSL SLK Capacity part number specified in the enable-ctrl-feat command>
To
Sheet 8

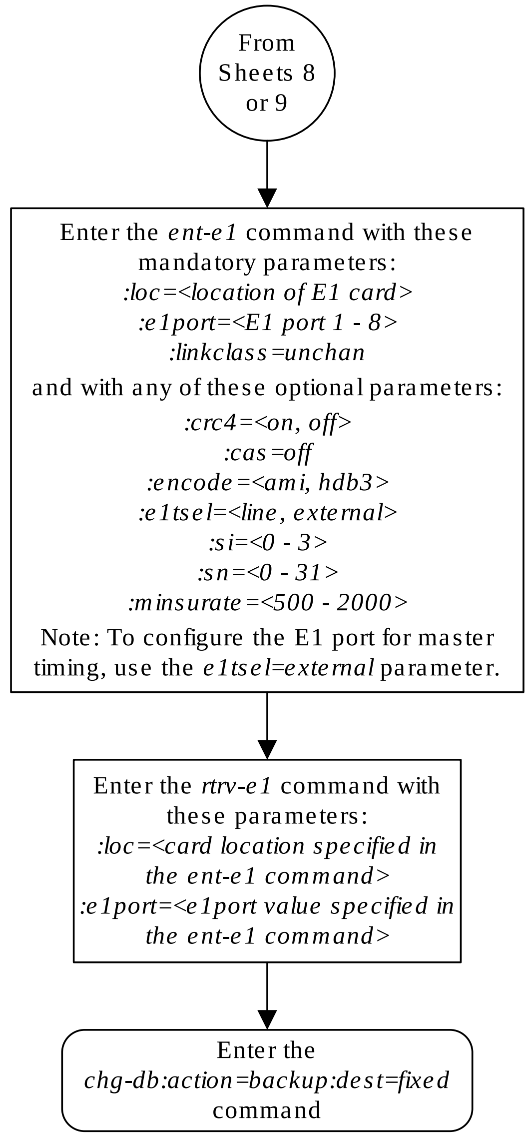
Sheet 7 of 10


From Sheets 5 or 7
Are E1 ports 3 through 8, channel bridged E1 ports, or unchannelized E1 ports, shown in the *rtrv-e1* output on Sheet 1, shown on E1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 10
No
Enter the *rept-stat-gpl:gpl=hipr* command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the *rept-stat-gpl:gpl=hipr2* command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the *Installation Manual* and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 9

Sheet 8 of 10


From Sheet 8
Will the E1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 10
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 10

Sheet 9 of 10


From Sheets 8 or 9
Enter the ent-e1 command with these mandatory parameters:
:loc=<location of E1 card>
:e1port=<E1 port 1 - 8>
:linkclass=unchan
and with any of these optional parameters:
:crc4=<on, off>
:cas=off
:encode=<ami, hdb3>
:e1tsel=<line, external>
:si=<0 - 3>
:sn=<0 - 31>
:minsurate=<500 - 2000>
Note: To configure the E1 port for master timing, use the e1tsel=external parameter.
Enter the rtrv-e1 command with these parameters:
:loc=<card location specified in the ent-e1 command>
:e1port=<e1port value specified in the ent-e1 command>
Enter the chg-db:action=backup:dest=fixed command

Sheet 10 of 10

A.9 Removing the E1 Interface Parameters

This procedure is used to remove an **E1** interface from the database using the `dlt-e1` command using these parameters.

`:loc` – The location of the **E1** card (card type `lime1`) containing the **E1** interface being removed.

`:e1port` – The **E1** port on the **E1** card containing the **E1** interface being removed.

The **E1** interface to be removed must exist in the database. This can be verified in step 1.

To remove the **E1** interface information contained on an **E1** card, all signaling links serviced by that **E1** card must be removed from the database. This can be verified with the `rtrv-e1` command, specifying the card location and `E1PORT` on the **E1** card, and the `rtrv-slk` command, specifying the location of any cards (**E1** or channel cards) shown in the `rtrv-e1` output. If there are any signaling links being serviced by the **E1** card, go to the Removing an SS7 Signaling Link procedure and remove these signaling links.

Even numbered **E1** ports cannot be removed if the even numbered **E1** port is channel bridged. Remove the corresponding odd numbered **E1** port (see Table A-5) to remove the even numbered channel bridged **E1** port.

1. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

      E1                                                      LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  2     ON    OFF  HDB3    EXTERNAL  3   5   ------    CHAN
----
1203  2     OFF   OFF  HDB3    LINE      1   7   ------    CHAN
----
1211  2     ON    OFF  HDB3    LINE      0   0   ------    CHAN
----
```

   If the **E1** port being removed is an even numbered **E1** port and is channel bridged, select the corresponding odd numbered **E1** port to remove (see Table A-5) and go to step 2.
   If the even numbered **E1** port is not channel bridged, it can be removed with the `dlt-e1` command. go to step 2.

2. Display the timeslots that are serviced by the **E1** card containing the **E1** interface information to be removed using the `rtrv-e1` command specifying the card location and the `e1port` value from step 1. For this example, enter this command.

```
rtrv-e1:loc=1201:e1port=2
```

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0

      E1                                                        LINK    MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS   RATE
1201  2     ON    OFF  HDB3    EXTERNAL  3   5   ------    CHAN    ----

TS0  (N/A)     TS8   ------    TS16  ------    TS24  ------
TS1  1201,A    TS9   ------    TS17  ------    TS25  ------
TS2  ------    TS10  ------    TS18  ------    TS26  ------
TS3  ------    TS11  ------    TS19  ------    TS27  ------
TS4  ------    TS12  ------    TS20  ------    TS28  ------
TS5  1202,A    TS13  ------    TS21  ------    TS29  ------
TS6  ------    TS14  ------    TS22  ------    TS30  ------
TS7  ------    TS15  ------    TS23  ------    TS31  ------
```

If this step shows any timeslots that are serviced by the **E1** card, go to the Removing an SS7 Signaling Link procedure and remove the timeslots and signaling links serviced by the **E1** card.

3. Remove the **E1** interface information to the database using the `dlt-e1` command specifying the card location of the **E1** card and the E1PORT on that card. For this example, enter these commands.

   `dlt-e1:loc=1201:e1port=2`

4. Verify the changes using the `rtrv-e1` command with the card location and the `e1port` value specified in 3 .

   For this example, enter this command.

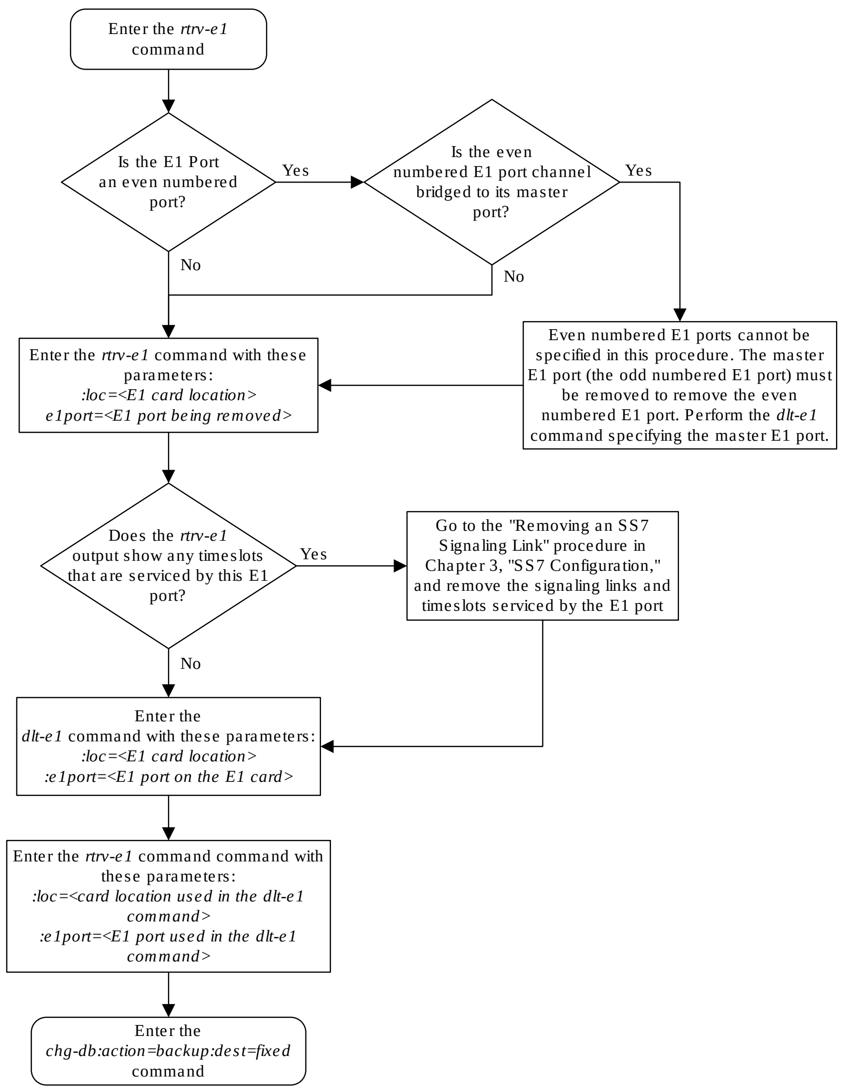
   `rtrv-e1:loc=1201:e1port=2`

```
rlghncxa03w 10-04-19 21:17:04 GMT EAGLE5 42.0.0
E4055 Cmd Rej: The E1PORT at the specified location is not equipped
```

5. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure A-9 Removing the E1 Interface Parameters



A.10 Changing the Attributes of a Channelized E1 Port

This procedure is used to change the attributes of a channelized **E1** port using the `chg-e1` command. A channelized E1 port is an E1 port whose `LINKCLASS` value is `CHAN`, shown in the `LINKCLASS` column in the `rtrv-e1` output. Other actions can be performed on E1 ports. To perform these actions on the E1 ports, perform one of these procedures.

- To change the attributes of an unchannelized E1 port - Changing the Attributes of an Unchannelized E1 Port
- To make a channel bridged E1 port from a channelized E1 port - Making a Channel Bridged E1 Port from a Channelized E1 Port
- To make a non-channel bridged E1 port from a channel bridged E1 port - Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port

To change the attributes of a channelized E1 port, these parameters are used with the `chg-e1` command.

`:loc` – The location of the E1 card (card type `lime1`) that is servicing the E1 signaling link. The location of a channel card (card type `limch`) cannot be specified for this parameter. The E1 card can be either an **E1/T1 MIM**, an **HC -MIM**, or an **E5-E1T1** card.

`:e1port` – The E1 port being changed in this procedure.

`:crc4` – Specifies whether or not **CRC4** is enabled on the E1 signaling link.

`:cas` – Specifies whether **CAS** or **CCS** is used on the E1 signaling link. CAS is enabled with the `cas=on` parameter. CCS is enabled with the `cas=off` parameter. The `cas=on` parameter cannot be specified for an HC-MIM, or an E5-E1T1 card.

`:encode` – Specifies the type of encoding or decoding that is used on the E1 signaling link, either **HDB3** or **AMI**. AMI encoding can be specified only for an E1/T1 MIM, an HC-MIM, or an E5-E1T1 card.

`:e1tsel` – The timing source for the E1 signaling link, master timing (`external`), slave timing (`line`), or `recovered`.

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3.

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31.

The **E1** card specified in this procedure must be in the database. This can be verified with the `rtrv-e1` command.

If either the `crc4`, `cas`, `encode`, or `e1tsel` values are being changed, all the signaling links serviced by the E1 card must be taken out of service.

If the signaling link being serviced by the E1 card is using timeslot 16, the `cas=on` parameter cannot be specified with the `chg-e1` command.

1. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
      E1                                                     LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL     SI  SN  CHANBRDG  CLASS
RATE
1201  2     ON    OFF  HDB3    EXTERNAL   3   5   ------    CHAN
----
1203  2     OFF   OFF  HDB3    LINE       1   7   ------    CHAN
----
1211  2     ON    OFF  HDB3    LINE       0   0   ------    CHAN
----
```

A channelized E1 port is an E1 port whose `LINKCLASS` value is `CHAN`.

If there are no channelized E1 ports shown in the `rtrv-e1` output, this procedure cannot be performed.

If there are channelized E1 ports shown in the `rtrv-e1` output, continue the procedure by performing one of these steps.

- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are being changed in this procedure, continue the procedure with 2.
- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are not being changed in this procedure, continue the procedure by performing one of these steps.
  - If the E1 port is channel bridged (the entry `MASTER` is shown in the `CHANBRDG` column for the odd numbered E1 port in the `rtrv-e1` output), or if E1 ports 3 through 8 are assigned to the E1 card, the card is either an HC-MIM or an E5-E1T1 card. Continue the procedure with 7.
  - If the E1 port is not channel bridged, or if E1 ports 3 through 8 are not assigned to the E1 card, continue the procedure with 6 to verify the type of E1 card that the E1 port is assigned to.

2. Display the timeslots that are serviced by the **E1** card containing the E1port that is being changed using the `rtrv-e1` command specifying the card location and the `e1port` value from 1.

   For this example, enter this command.

   `rtrv-e1:loc=1201:e1port=2`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                     LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL     SI  SN  CHANBRDG  CLASS
RATE
1201  2     ON    OFF  HDB3    EXTERNAL   3   5   ------    CHAN
----

TS0   (N/A)     TS8   ------     TS16  ------     TS24  ------
```

```
TS1  1201,A   TS9   ------   TS17  ------   TS25  ------
TS2  ------   TS10  ------   TS18  ------   TS26  ------
TS3  ------   TS11  ------   TS19  ------   TS27  ------
TS4  ------   TS12  ------   TS20  ------   TS28  ------
TS5  1202,A   TS13  ------   TS21  ------   TS29  ------
TS6  ------   TS14  ------   TS22  ------   TS30  ------
TS7  ------   TS15  ------   TS23  ------   TS31  ------
```

3. Display the signaling links that are assigned to the E1 card by entering the `rtrv-slk` command with the card location specified in 2. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T                PCR  PCR    E1   E1
LOC   LINK LSN          SLC TYPE      SET  BPS    ECM    N1   N2     LOC  PORT
TS
1201 A    lsn1          13 LIME1     1    56000  BASIC ---  ----- 1201 2
25
1201 B    lsn1          12 LIME1     1    56000  BASIC ---  ----- 1201 1
20
```

4. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=a`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,A  lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 2 available
```

   `rept-stat-slk:loc=1201:link=b`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,B  lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 1 available
```

   If all the signaling links shown in this step are out of service, continue the procedure by performing one of these steps.

   - If the E1 port is channel bridged (the entry `MASTER` is shown in the `CHANBRDG` column for the odd numbered E1 port in the `rtrv-e1` output), or if E1 ports 3 through 8 are assigned to the E1 card, the card is either an HC-MIM or an E5-E1T1 card. Continue the procedure with 7.

- If the E1 port is not channel bridged, or if E1 ports 3 through 8 are not assigned to the E1 card, continue the procedure with 6 to verify the type of E1 card that the E1 port is assigned to.

If any of the signaling links shown in this step are in service, continue the procedure with 5.

5. Deactivate the in service signaling links shown in 4 using the `dact-slk` command.

   For this example, enter these commands.

   `dact-slk:loc=1201:link=a`

   `dact-slk:loc=1201:link=b`

   After the signaling links have been deactivated, continue the procedure by performing one of these steps.

   - If the E1 port is channel bridged (the entry `MASTER` is shown in the `CHANBRDG` column for the odd numbered E1 port in the `rtrv-e1` output), or if E1 ports 3 through 8 are assigned to the E1 card, the card is either an HC-MIM or an E5-E1T1 card. Continue the procedure with 7.
   - If the E1 port is not channel bridged, or if E1 ports 3 through 8 are not assigned to the E1 card, continue the procedure with 6 to verify the type of E1 card that the E1 port is assigned to.

6. Display the LIME1 cards in the database by entering this command.

   `rtrv-stp:type=lime1`

```
rlghncxa03w 09-05-30 11:07:17 EST  EAGLE 41.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL
GPL Version
----  -----------  ---  -------------  ----     --    ----
-----------

1201  870-2671-02  C    10145689323    LIME1    512M  SS7ANSI
126-034-000
1203  870-1873-01  C    10345690569    LIME1    512M  SS7ANSI
126-034-000
1211  870-1873-01  C    10346790570    LIME1    512M  SS7ANSI
126-034-000

Command Completed.
```

   The part numbers and the card types of the E1 cards are shown in Table A-4.

7. Change the **E1** port using the `chg-e1` command and the parameter combinations shown in Table A-13 , based on the type of **E1** card being used.

Table A-13 E1 Interface Parameter Combinations

E1/T1MIM	Non-Channel Bridged E1 Ports - HC-MIM or E5-E1T1 Card	Channel Bridged E1 Ports - HC-MIM or E5-E1T1 Card
	Mandatory Parameters	
:loc=location of the E1 card	:loc=location of the E1 card	:loc=location of the E1 card
:e1port=E1 port being changed, either 1 or 2	:e1port=E1 port being changed, either 1, 2, 3, 4, 5, 6, 7, or 8	:e1port=E1 port being changed, either 1, 3, 5, or 7
	Optional Parameters	
:cas=on, off (See the Note)	:cas=off	:cas=off
:crc4=on, off	:crc4=on, off	:crc4=on, off
:encode=ami, hdb3	:encode=ami, hdb3	:encode=ami, hdb3
:si=0 - 3	:si=0 - 3	:si=0 - 3
:sn=0 - 31	:sn=0 - 31	:sn=0 - 31
:e1tsel=line, external	:e1tsel=line, external	:e1tsel=external, recovered
Note: If timeslot 16 is being used for the signaling link that is assigned to the E1 port, the `cas` value must be `off`.		

For this example, enter this command.

```
chg-e1:loc=1201:e1port=2:crc4=off:encode=hdb3:si=1:sn=9
```

8. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 7.

   For this example, enter this command.

```
rtrv-e1:loc=1201:e1port=2


rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                 LINK     MINSU
LOC   PORT   CRC4   CAS   ENCODE   E1TSEL     SI   SN   CHANBRDG   CLASS    RATE
1201  2      OFF    OFF   HDB3     EXTERNAL   1    9    ------     CHAN     ----

TS0  (N/A)     TS8   ------     TS16  ------     TS24  ------
TS1  1201,A    TS9   ------     TS17  ------     TS25  ------
TS2  ------    TS10  ------     TS18  ------     TS26  ------
TS3  ------    TS11  ------     TS19  ------     TS27  ------
TS4  ------    TS12  ------     TS20  ------     TS28  ------
TS5  1202,A    TS13  ------     TS21  ------     TS29  ------
TS6  ------    TS14  ------     TS22  ------     TS30  ------
TS7  ------    TS15  ------     TS23  ------     TS31  ------
```

   If the signaling links were not deactivated in 5, continue the procedure with 10.

   If the signaling links were deactivated in 5, continue the procedure with 9.

9. Activate the signaling links that were deactivated in 5 using the `act-slk` command.

   For this example, enter these commands.

```
act-slk:loc=1201:link=a
```

```
act-slk:loc=1201:link=b
```

When each of these commands have successfully completed, this message should appear.

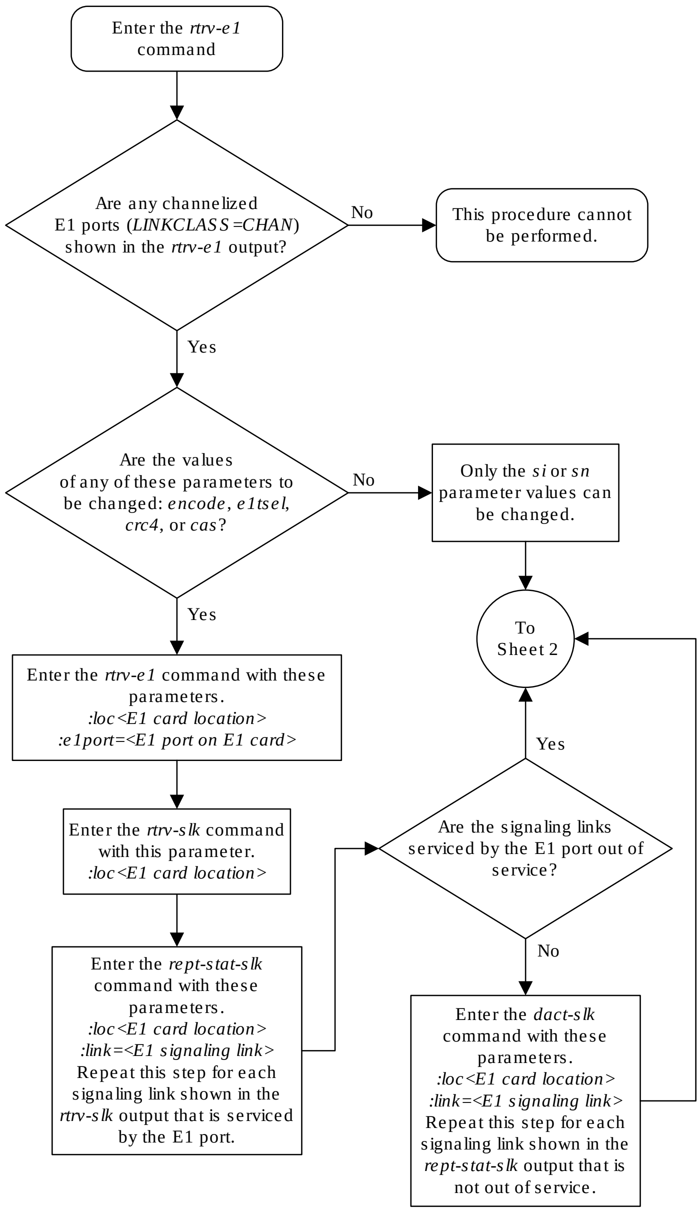
```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Activate Link message sent to card
```

10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

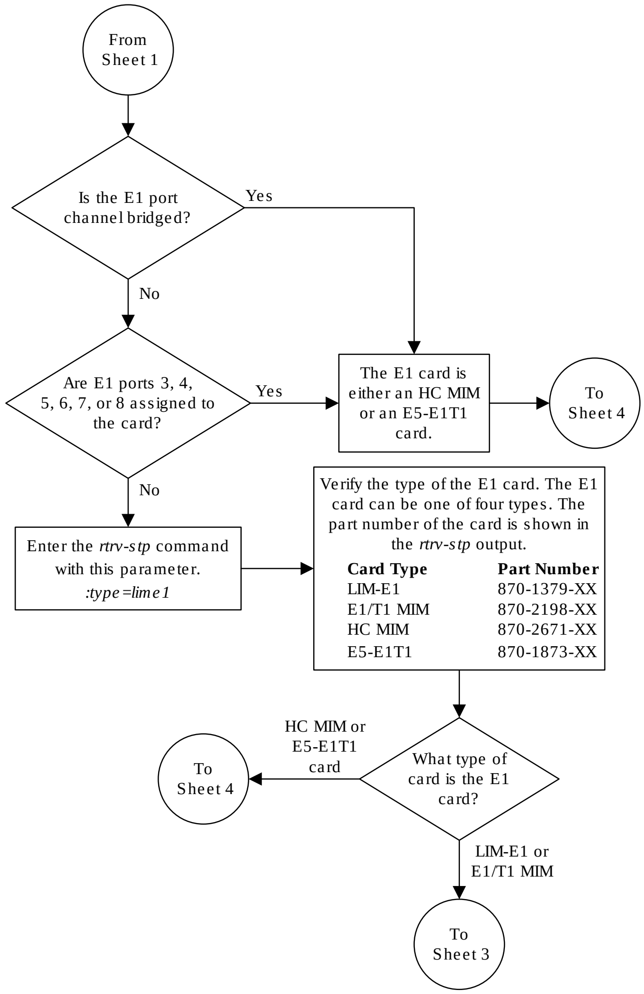
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

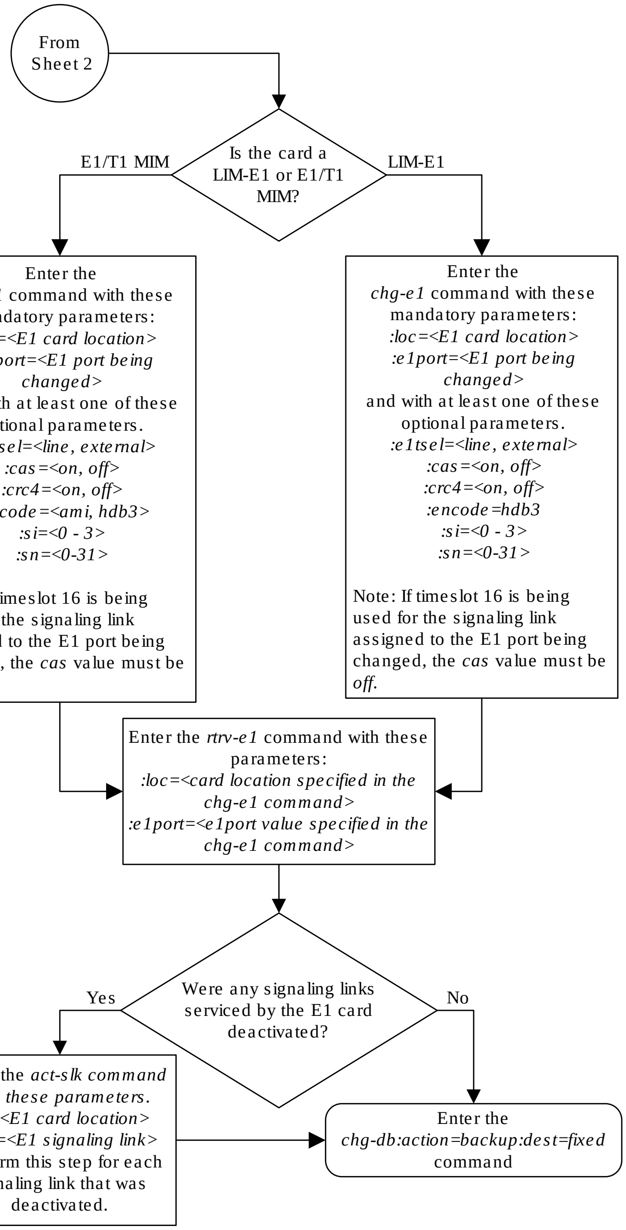
Figure A-10   Changing the Attributes of a Channelized E1 Port



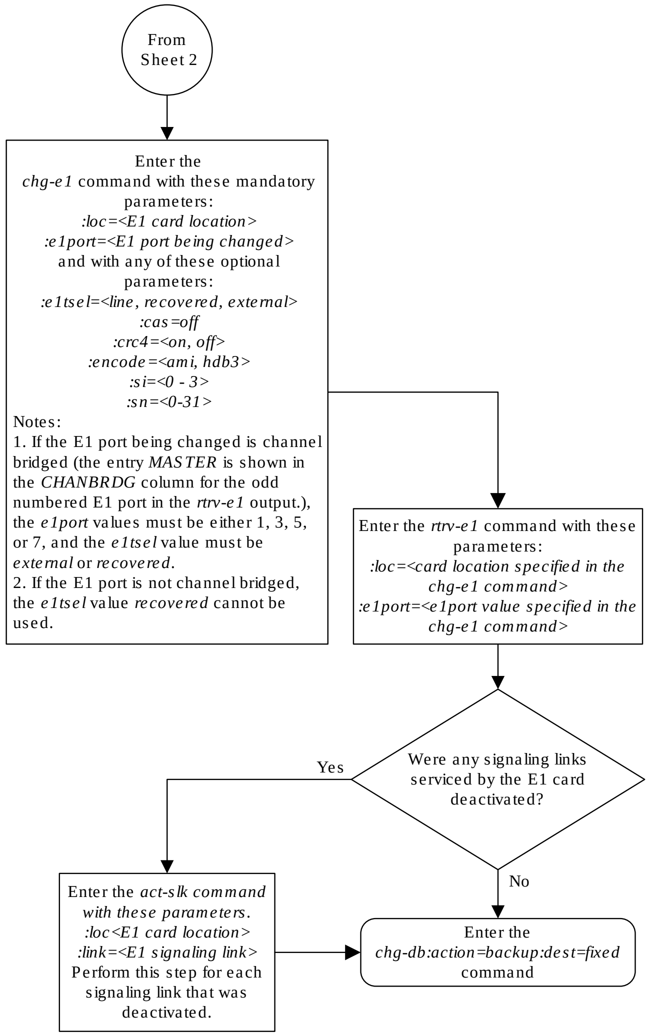
Sheet 1 of 4


From Sheet 1
Is the E1 port channel bridged?
Yes
No
Are E1 ports 3, 4, 5, 6, 7, or 8 assigned to the card?
Yes
The E1 card is either an HC MIM or an E5-E1T1 card.
To Sheet 4
No
Enter the *rtrv-stp* command with this parameter.
:type=lime1
Verify the type of the E1 card. The E1 card can be one of four types. The part number of the card is shown in the *rtrv-stp* output.
Card Type **Part Number**
LIM-E1 870-1379-XX
E1/T1 MIM 870-2198-XX
HC MIM 870-2671-XX
E5-E1T1 870-1873-XX
What type of card is the E1 card?
HC MIM or E5-E1T1 card
To Sheet 4
LIM-E1 or E1/T1 MIM
To Sheet 3

Sheet 2 of 4


From Sheet 2
Is the card a LIM-E1 or E1/T1 MIM?
E1/T1 MIM
LIM-E1
Enter the chg-e1 command with these mandatory parameters:
:loc=<E1 card location>
:e1port=<E1 port being changed>
and with at least one of these optional parameters.
:e1tsel=<line, external>
:cas=<on, off>
:crc4=<on, off>
:encode=<ami, hdb3>
:si=<0 - 3>
:sn=<0-31>
Note: If timeslot 16 is being used for the signaling link assigned to the E1 port being changed, the cas value must be off.
Enter the chg-e1 command with these mandatory parameters:
:loc=<E1 card location>
:e1port=<E1 port being changed>
and with at least one of these optional parameters.
:e1tsel=<line, external>
:cas=<on, off>
:crc4=<on, off>
:encode=hdb3
:si=<0 - 3>
:sn=<0-31>
Note: If timeslot 16 is being used for the signaling link assigned to the E1 port being changed, the cas value must be off.
Enter the rtrv-e1 command with these parameters:
:loc=<card location specified in the chg-e1 command>
:e1port=<e1port value specified in the chg-e1 command>
Were any signaling links serviced by the E1 card deactivated?
Yes
No
Enter the act-slk command with these parameters.
:loc<E1 card location>
:link=<E1 signaling link>
Perform this step for each signaling link that was deactivated.
Enter the chg-db:action=backup:dest=fixed command

Sheet 3 of 4



Sheet 4 of 4

A.11 Changing the Attributes of an Unchannelized E1 Port

This procedure is used to change the attributes of an unchannelized **E1** port using the `chg-e1` command. An unchannelized E1 port is an E1 port whose `LINKCLASS` value is `UNCHAN`, shown in the `LINKCLASS` column in the `rtrv-e1` output. Other actions can be performed on E1 ports. To perform these actions on the E1 ports, perform one of these procedures.

- To change the attributes of a channelized E1 port - Changing the Attributes of a Channelized E1 Port

- To make a channel bridged E1 port from a channelized E1 port - Making a Channel Bridged E1 Port from a Channelized E1 Port
- To make a non-channel bridged E1 port from a channel bridged E1 port - Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port

To change the attributes of an unchannelized E1 port, these parameters are used with the `chg-e1` command.

`:loc` – The location of the E1 card that contains the unchannelized E1 port (card type `lime1`) that is servicing the E1 signaling link. The location of a channel card (card type `limch`) cannot be specified for this parameter. The E1 card can be either an HC-MIM or an E5-E1T1 card.

`:e1port` – The E1 port being changed in this procedure.

`:crc4` – Specifies whether or not **CRC4** is enabled on the E1 signaling link.

`:cas` – Specifies whether **CAS** or **CCS** is used on the E1 signaling link. CAS is enabled with the `cas=on` parameter. CCS is enabled with the `cas=off` parameter. For an unchannelized E1 port, the `cas` value must be `off`.

`:encode` – Specifies the type of encoding or decoding that is used on the E1 signaling link, either **HDB3** or **AMI**.

`:e1tsel` – The timing source for the E1 signaling link, master (`external`) or slave (`line`).

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3.

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31.

`:minsurate` – Specifies the minimum number of signaling units (**FISUs** and **LSSUs**) per second that are transmitted on the outbound E1 signaling link during idle periods or when there is an unused portion of the link's bandwidth. The value of this parameter is from 500 to 2000 signaling units per second, with the default value of 1000 signaling units per second.

The E1 card specified in this procedure must be in the database. This can be verified with the `rtrv-e1` command.

If either the `crc4`, `cas`, `encode`, or `e1tsel` values are being changed, all the signaling links serviced by the E1 card must be taken out of service.

1. Display the existing E1 interfaces in the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      E1                                                   LINK    MINSU
```

```
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  2     ON    ---  HDB3    EXTERNAL  3   5   ------    UNCHAN
1300
1203  2     OFF   ---  HDB3    LINE      1   7   ------    CHAN
----
1211  2     ON    ---  HDB3    LINE      0   0   ------    CHAN
----
```

An unchannelized E1 port is an E1 port whose `LINKCLASS` value is `UNCHAN`.

If there are no unchannelized E1 ports shown in the `rtrv-e1` output, this procedure cannot be performed.

If there are unchannelized E1 ports shown in the `rtrv-e1` output, continue the procedure by performing one of these steps.

- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are being changed in this procedure, continue the procedure with 2.
- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are not being changed in this procedure, continue the procedure with 5.

2. Display the signaling links that are assigned to the E1 card by entering the `rtrv-slk` command with the card location shown in 1. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

                                  L2T              PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS     ECM   N1   N2
LOC  PORT TS
1201 A    lsn1          13 LIME1    1    56000   BASIC ---  -----
1201 2    25
```

3. Check the status of the signaling links shown in 2 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=a`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN        CLLI         PST           SST        AST
1201,A   lsn1       ----------- IS-NR         Avail      ----
  ALARM STATUS        = No Alarms
  UNAVAIL REASON      = --
  E1 status           = 1201, RCVRY-E1F:FAC-E1 Port 2 available
```

   If all the signaling links shown in this step are out of service, continue the procedure with 5.

If any of the signaling links shown in this step are in service, continue the procedure with 4.

4. Deactivate the signaling links shown in 3 using the `dact-slk` command.

   For this example, enter this command.

   `dact-slk:loc=1201:link=a`

5. Change the E1 port using the `chg-e1` command and the parameter combinations shown in Table A-14.

Table A-14 Unchannelized E1 Port Parameter Combinations

Mandatory Parameters
:loc=location of the E1 card
:e1port=E1 port being changed, either 1, 2, 3, 4, 5, 6, 7, or 8
Optional Parameters
:cas=off
:crc4=on, off
:encode=ami, hdb3
:si=0 - 3
:sn=0 - 31
:e1tsel=line, external
:minsurate=500 - 2000

   For this example, enter this command.

   `chg-e1:loc=1201:e1port=2:crc4=off:encode=hdb3:si=1:sn=9`

6. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 5.

   For this example, enter these commands.

   `rtrv-e1:loc=1201:e1port=2`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                 LINK    MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS   RATE
1201  2     OFF   ---  HDB3    EXTERNAL  1   9   ------    UNCHAN  1300
```

   If the signaling links were not deactivated in 4, continue the procedure with 8.

   If the signaling links were deactivated in 4, continue the procedure with 7.

7. Activate the signaling links that were deactivated in 4 using the `act-slk` command.

   For this example, enter this command.

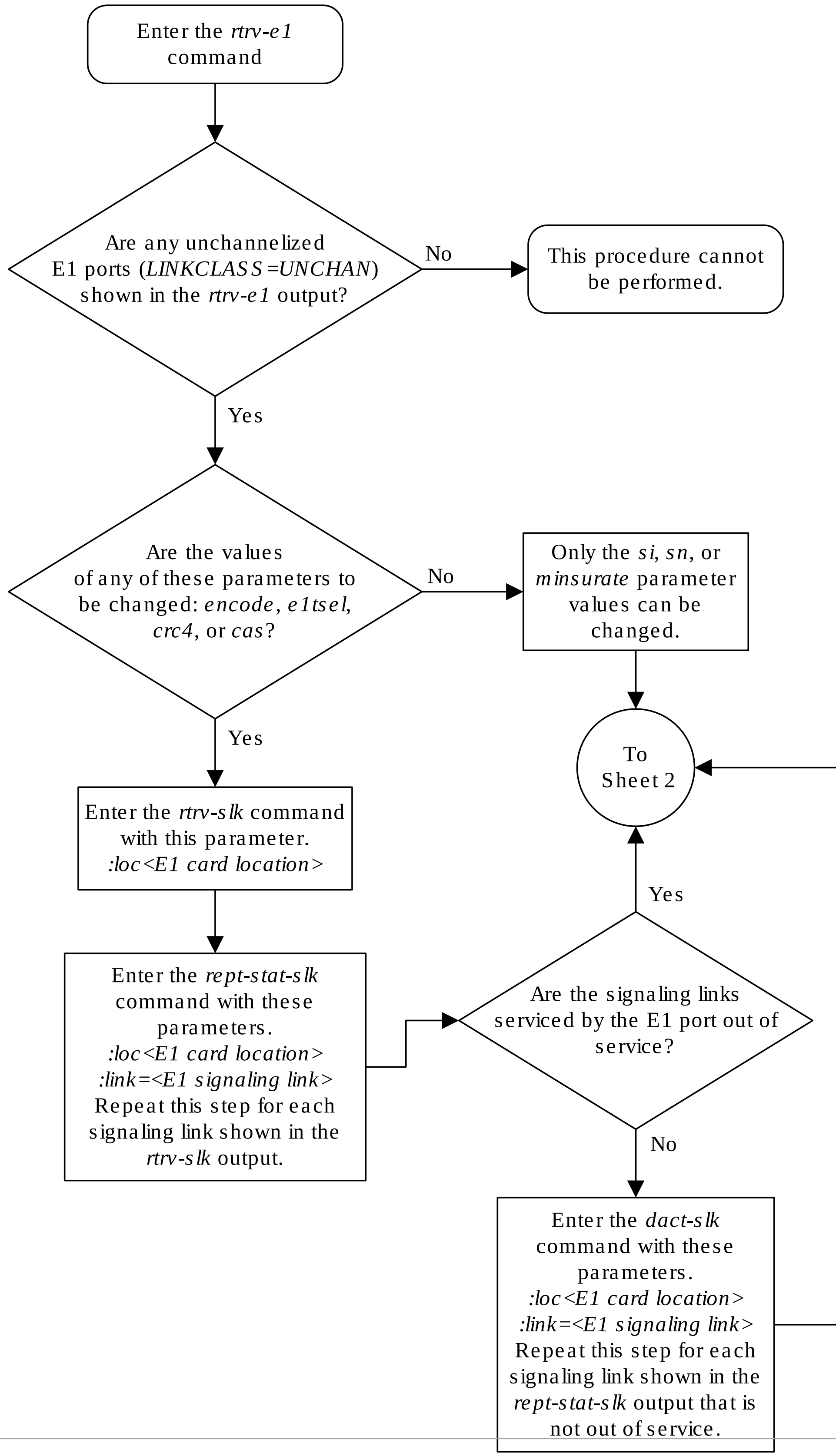
   `act-slk:loc=1201:link=a`

8. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

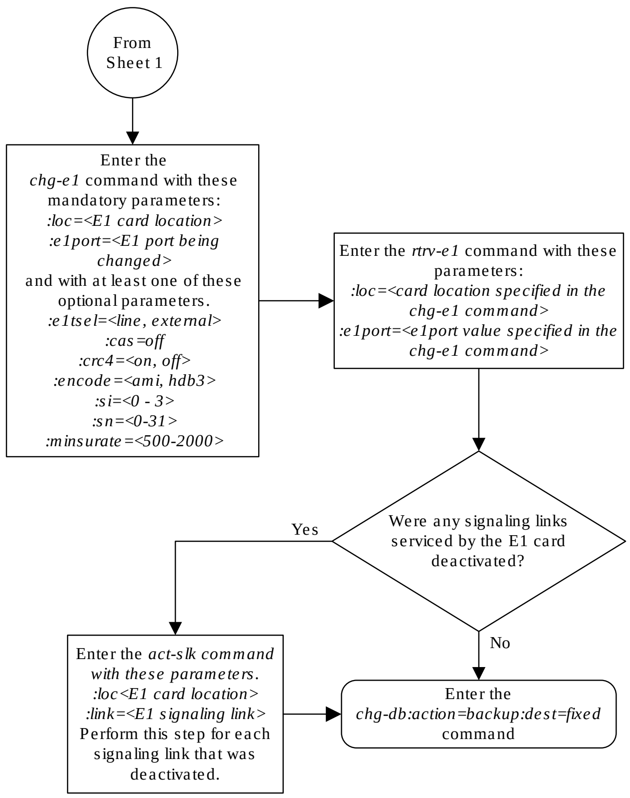
These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure A-11 Changing the Attributes of an Unchannelized E1 Port



Sheet 1 of 2



Sheet 2 of 2

A.12 Making a Channel Bridged E1 Port from a Channelized E1 Port

This procedure is used to make a channel bridged E1 port from a channelized E1 port that is not channel bridged using the `chg-e1` command. A channelized E1 port is an E1 port whose `LINKCLASS` value is `CHAN`, shown in the `LINKCLASS` column in the `rtrv-e1` output. A non-channel bridged E1 port is an odd numbered E1 port that contains dashes in the `CHANBRDG` column in the `rtrv-e1` output. Other actions can be performed on E1 ports. To perform these actions on the E1 ports, perform one of these procedures.

- To change the attributes of a channelized E1 port - Changing the Attributes of a Channelized E1 Port
- To change the attributes of an unchannelized E1 port - Changing the Attributes of an Unchannelized E1 Port
- To make a non-channel bridged E1 port from a channel bridged E1 port - Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port

To make a channel bridged E1 port from a channelized E1 port, these parameters are used with the `chg-e1` command.

`:loc` – The location of the E1 card (card type `lime1`) that contains the odd numbered channelized E1 port. The location of a channel card (card type `limch`) cannot be specified for this parameter. The E1 card can be either an **HC-MIM,** or an **E5-E1T1** card.

`:e1port` – The E1 port being changed in this procedure. Only the odd numbered E1 ports, 1, 3, 5, or 7, can be specified for a channel bridged E1 port.

`:crc4` – Specifies whether or not **CRC4** is enabled on the E1 signaling link.

`:cas` – Specifies whether **CAS** or **CCS** is used on the E1 signaling link. CAS is enabled with the `cas=on` parameter. CCS is enabled with the `cas=off` parameter. For a channel bridged E1 port, the `cas` parameter value must be `off`.

`:encode` – Specifies the type of encoding or decoding that is used on the E1 signaling link, either **HDB3** or **AMI**.

`:e1tsel` – The timing source for the E1 signaling link, master (`external`) or `recovered`.

The `recovered` timing source uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

Note:

To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see the Configuring the Options for the TDM Global Timing Interface procedure.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3.

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31.

`:chanbrdg` – Specifies whether or not the odd numbered E1 port specified in this procedure is channel bridged to its adjacent even numbered E1 port. Table A-15 shows the E1 ports that can be specified with the `chanbrdg=on` parameter and the even-numbered E1 ports that are bridged to the odd numbered E1 port.

Table A-15 Channel Bridging Ports

Odd Numbered E1 Port	Even Numbered Bridged E1 Port
1	2
3	4
5	6
7	8

`:force=yes` – required when the even numbered E1 port being channel bridged is provisioned in the database before this procedure is performed.

The E1 card specified in this procedure must be in the database. This can be verified with the `rtrv-e1` command.

If either the `crc4`, `cas`, `encode`, or `e1tsel` values are being changed, all the signaling links serviced by the E1 card must be taken out of service.

1. Display the existing E1 ports in the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
      E1                                                     LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG   CLASS
RATE
1201  1     ON    OFF  HDB3    EXTERNAL  3   5   ------     CHAN
----
1201  2     ON    OFF  HDB3    EXTERNAL  3   5   ------     CHAN
----
1203  2     OFF   OFF  HDB3    LINE      1   7   ------     CHAN
----
1211  2     ON    OFF  HDB3    LINE      0   0   ------     CHAN
----
```

   A channelized E1 port is an E1 port whose `LINKCLASS` value is `CHAN`.

   If there are no odd numbered channelized E1 ports that are not channel bridged shown in the `rtrv-e1` output, this procedure cannot be performed.

   If odd numbered channelized E1 ports that are not channel bridged are shown in the `rtrv-e1` output, continue the procedure by performing one of these steps.

   - If the E1 card contains channel bridged E1 ports, or contains E1 ports 3 through 8, continue the procedure with by performing one of these steps.
     – If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are not being changed in this procedure, continue the procedure by performing one of these steps.
       * If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards have E1 ports 3 through 8 provisioned,

contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure by performing one of these steps.

      * If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
      * If the adjacent E1 port is not provisioned, continue the procedure with 12.

    * If E1 cards are not shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 7.
    * If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 7.

  – If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are being changed in this procedure, continue the procedure with 3.

- If the E1 card does not contain channel bridged E1 ports, or does not contain E1 ports 3 through 8, continue the procedure with 2.

2. Display the LIME1 cards in the database by entering this command.

```
rtrv-stp:type=lime1


rlghncxa03w 09-05-30 11:07:17 EST  EAGLE 41.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL         GPL
Version
----  -----------  ---  -------------  ----     --    ----
-----------

1201  870-2671-02  C    10145689323    LIME1    512M  SS7ANSI
126-034-000
1203  870-1873-01  C    10345690569    LIME1    512M  SS7ANSI
126-034-000
1211  870-1873-01  C    10346790570    LIME1    512M  SS7ANSI
126-034-000

Command Completed.
```

The part numbers and the card types of the E1 cards are shown in Table A-4.

If the E1 card is an E1/T1 MIM, this card cannot be used in this procedure, Choose another E1 port on another HC-MIM or E5-E1t1 card and repeat this procedure from 1. If no HC-MIMs or E5-E1T1 cards are present in the EAGLE 5 ISS, this procedure cannot be performed.

If the E1 card is either an HC-MIM card or an E5-E1T1 card, continue the procedure by performing one of these steps.

- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are not being changed in this procedure, continue the procedure by performing one of these steps.

  – If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards have

E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure by performing one of these steps.

  * If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
  * If the adjacent E1 port is not provisioned, continue the procedure with 12.

- If E1 cards are not shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 7.
- If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 7.

• If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are being changed in this procedure, continue the procedure with 3.

3. Display the timeslots that are serviced by the E1 card containing the E1 port being changed using the `rtrv-e1` command specifying the card location and the `e1port` value from 1.

   For this example, enter this command.

```
rtrv-e1:loc=1201:e1port=1


rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                        LINK
MINSU
LOC    PORT   CRC4   CAS   ENCODE   E1TSEL     SI   SN   CHANBRDG   CLASS
RATE
1201   1      ON     OFF   HDB3     EXTERNAL   3    5    ------     CHAN
----

TS0   (N/A)      TS8   ------    TS16  ------    TS24  ------
TS1   1201,A     TS9   ------    TS17  ------    TS25  ------
TS2   ------     TS10  ------    TS18  ------    TS26  ------
TS3   ------     TS11  ------    TS19  ------    TS27  ------
TS4   ------     TS12  ------    TS20  ------    TS28  ------
TS5   1202,A     TS13  ------    TS21  ------    TS29  ------
TS6   ------     TS14  ------    TS22  ------    TS30  ------
TS7   ------     TS15  ------    TS23  ------    TS31  ------
```

4. Display the signaling links that are assigned to the E1 card by entering the `rtrv-slk` command with the card location specified in 3. For this example, enter this command.

```
rtrv-slk:loc=1201


rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T                PCR   PCR
```

```
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM   N1   N2    LOC  PORT
TS
1201 A    lsn1          13 LIME1    1    56000  BASIC ---  ----- 1201 2
25
1201 B    lsn1          12 LIME1    1    56000  BASIC ---  ----- 1201 1
20
```

5. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=a`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,A   lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 2 available
```

   `rept-stat-slk:loc=1201:link=b`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,B   lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 1 available
```

   If all the signaling links shown in this step are out of service, continue the procedure by performing one of these steps.

   - If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure by performing one of these steps.
     – If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
     – If the adjacent E1 port is not provisioned, continue the procedure with 12.
   - If E1 cards are not shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 7.
   - If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 7.

If any of the signaling links shown in this step are in service, continue the procedure with 6.

6. Deactivate the signaling links shown in 5 using the `dact-slk` command.

   For this example, enter these commands.

   `dact-slk:loc=1201:link=a`

   `dact-slk:loc=1201:link=b`

   Continue the procedure by performing one of these steps.

   - If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards have E1 ports 3 through 8 provisioned, contain channel bridged E1 ports, or unchannelized E1 ports, continue the procedure by performing one of these steps.
     – If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
     – If the adjacent E1 port is not provisioned, continue the procedure with 12.
   - If E1 cards are not shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that will contain the E1 port that is being added, continue the procedure with 7.
   - If E1 cards are shown in the `rtrv-e1` output in 1 that are on the same shelf as the card that contains the E1 port that is being changed, and these cards do not have E1 ports 3 through 8 provisioned, do not contain channel bridged E1 ports, or do not have unchannelized E1 ports, continue the procedure with 7.

7. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the E1 port being changed in this procedure by entering this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD      RUNNING            APPROVED      TRIAL
HIPR2       1109      126-002-000        126-002-000   126-003-000
HIPR2       1110      126-002-000        126-002-000   126-003-000
HIPR2       1209      126-002-000        126-002-000   126-003-000
HIPR2       1210      126-002-000        126-002-000   126-003-000
HIPR2       1309      126-002-000        126-002-000   126-003-000
HIPR2       1310      126-002-000        126-002-000   126-003-000
HIPR2       2109      126-002-000        126-002-000   126-003-000
HIPR2       2110      126-002-000        126-002-000   126-003-000
Command Completed
```

   If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure by performing one of these steps.

  - If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
  - If the adjacent E1 port is not provisioned, continue the procedure with 12.
- If the card is an HC-MIM, continue the procedure with 8.

If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure by performing one of these steps.
  - If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
  - If the adjacent E1 port is not provisioned, continue the procedure with 12.
- If the card is an HC-MIM, continue the procedure with 8.

8. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in the *Commands User's Guide*.

If the Fan feature is on, continue the procedure by performing one of these steps.

- If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
- If the adjacent E1 port is not provisioned, continue the procedure with 12.

If the Fan feature is off, continue the procedure with 9.

9. Turn the Fan feature on by entering this command.

```
chg-feat:fan=on
```

> **Note:**
>
> Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

10. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

If the fans are not installed on the shelf containing the HC-MIM, go to the *Installation User's Guide* and install the fans.

After the fans have been installed and tested, or if the fans were already installed. continue the procedure by performing one of these steps.

- If the adjacent E1 port is provisioned (see Table A-15), continue the procedure with 11.
- If the adjacent E1 port is not provisioned, continue the procedure with 12.

11. Display the **E1** signaling links in the database by entering this command.

```
rtrv-slk:class=e1
```

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T                PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM   N1   N2
LOC  PORT TS
1201 A    lsn1          13 LIME1    1    56000  BASIC ---  -----
1201 2    25
1201 B    lsn1          12 LIME1    1    56000  BASIC ---  -----
1201 1    20
1202 A    lsn1          0  LIMCH    1    56000  BASIC ---  -----
1201 1    5
1202 B    lsn1          8  LIMCH    1    56000  BASIC ---  -----
1201 1    1
1203 A1   lsn1          4  LIME1    1    56000  BASIC ---  -----
1203 2    20
1203 B1   lsn1          9  LIME1    1    56000  BASIC ---  -----
1203 1    2
1204 A2   lsn1          5  LIMCH    1    56000  BASIC ---  -----
1203 1    21
1204 A3   lsn1          6  LIMCH    1    56000  BASIC ---  -----
1203 1    22
1211 A    lsn1          14 LIME1    1    56000  BASIC ---  -----
1211 1    7
1212 A    lsn1          10 LIMCH    1    56000  BASIC ---  -----
1211 1    28
1212 B    lsn1          11 LIMCH    1    56000  BASIC ---  -----
1211 1    25
1213 A4   lsn1          1  LIME1    1    56000  BASIC ---  -----
1213 1    17
1213 A5   lsn1          7  LIME1    1    56000  BASIC ---  -----
1213 5    23
1213 B5   lsn1          2  LIME1    1    56000  BASIC ---  -----
1213 1    24
1213 A6   lsn1          3  LIME1    1    56000  BASIC ---  -----
1213 5    19
```

If an even numbered **E1** port is to be channel bridged, and that **E1** port is assigned to signaling links, these signaling links must be removed before the **E1** port can be channel bridged. Perform Removing an SS7 Signaling Link to remove these signaling links. After the signaling links have been removed, continue the procedure with 12.

If the even numbered **E1** port to be channel bridged is not assigned to signaling links, continue the procedure with 12.

12. Change the E1 port using the `chg-e1` command and the parameter combinations shown in Table A-16.

Table A-16 Channel Bridged E1 Port Parameter Combinations

Mandatory Parameters
:loc=location of the **E1** card
:e1port=**E1** port being changed, either 1, 3, 5, or 7
:chanbrdg=on
Optional Parameters
:cas=off
:crc4=on, off
:encode=ami, hdb3
:si=0 - 3
:sn=0 - 31
:e1tsel=external, recovered (See Note 1)
:force=yes (See Note 2)
Notes:
1. The `e1tsel` value must be either `external` or `recovered`. If the current `e1tsel` parameter value is `line`, the `e1tsel` parameter value for the E1 port being channel bridged must be changed.
2. The `force=yes` parameter must be used when the even numbered port being channel bridged is shown in the `rtrv-e1` output in 1. If the even numbered port being channel bridged is not shown in the `rtrv-e1` output in 1, the `force=yes` parameter cannot be used.

For this example, enter this command.

```
chg-
e1:loc=1201:e1port=1:crc4=off:encode=ami:si=1:sn=9:chanbrdg=on:fo
rce=yes
```

13. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 12.

For this example, enter these commands.

```
rtrv-e1:loc=1201:e1port=1
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                      LINK    MINS
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS   RATE
1201  1     OFF   OFF  AMI     EXTERNAL  1   9   MASTER    CHAN    ----

TS0   (N/A)     TS8   ------    TS16  ------    TS24  ------
TS1   1201,A    TS9   ------    TS17  ------    TS25  ------
TS2   ------    TS10  ------    TS18  ------    TS26  ------
TS3   ------    TS11  ------    TS19  ------    TS27  ------
TS4   ------    TS12  ------    TS20  ------    TS28  ------
TS5   1202,A    TS13  ------    TS21  ------    TS29  ------
```

```
TS6   ------     TS14  ------     TS22  ------     TS30  ------
TS7   ------     TS15  ------     TS23  ------     TS31  ------
```

If the signaling links were not deactivated in 6, continue the procedure with 15.

If the signaling links were deactivated in 6, continue the procedure with 14.

14. Activate the signaling links that were deactivated in 6 using the `act-slk` command.

    For this example, enter these commands.

    `act-slk:loc=1201:link=a`

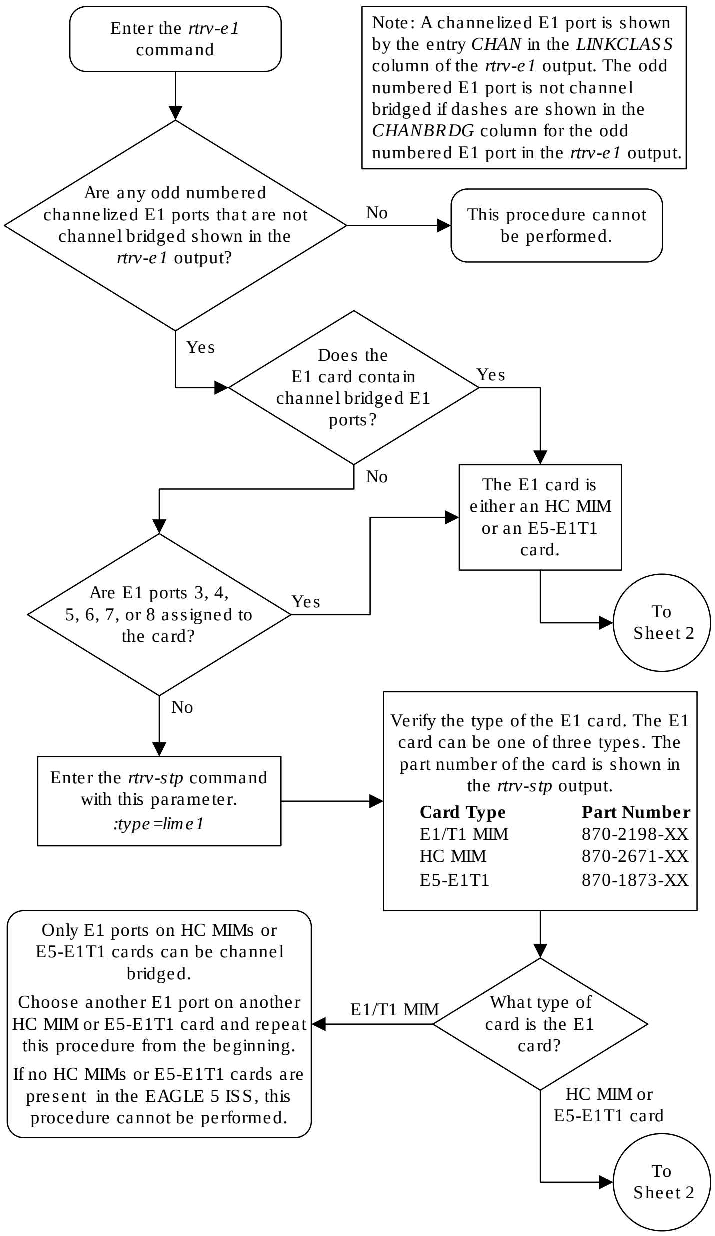
    `act-slk:loc=1202:link=a`

15. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

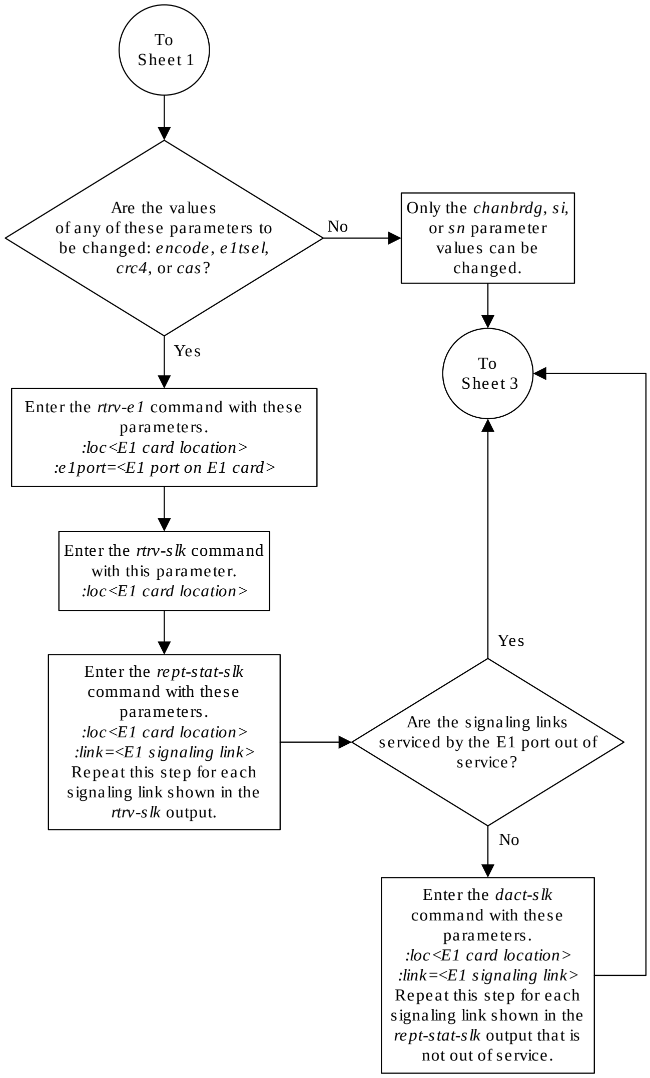
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

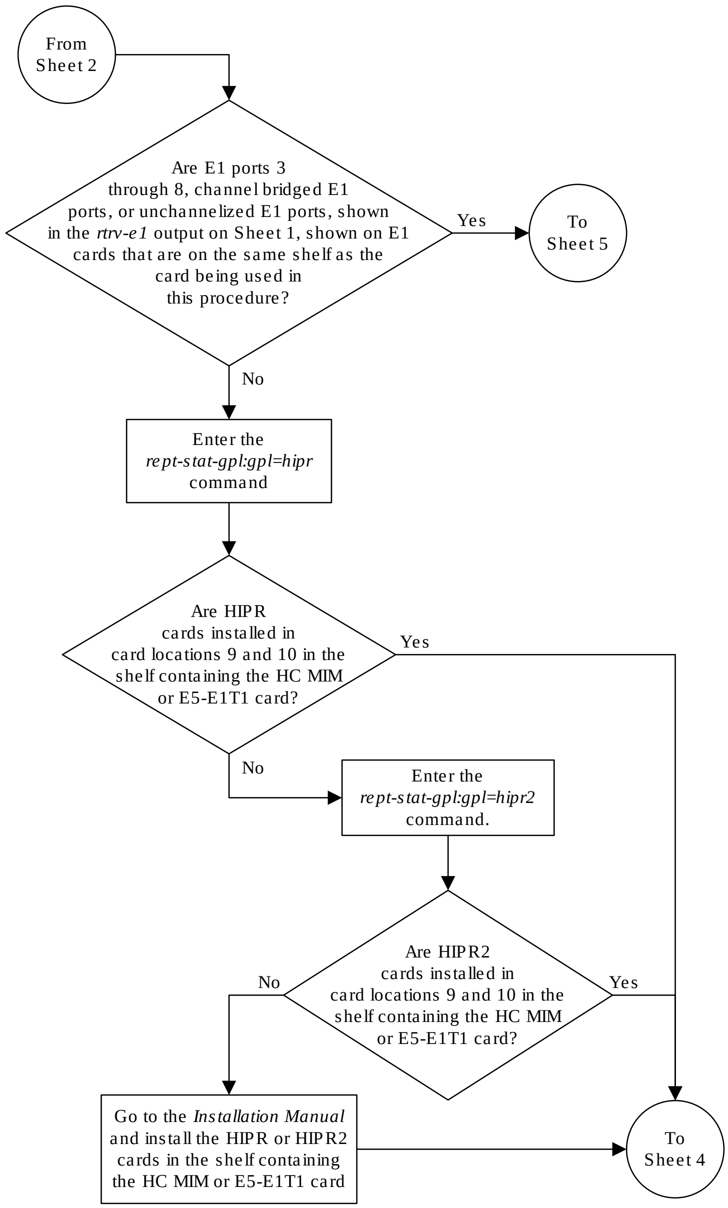
Figure A-12 Making a Channel Bridged E1 Port from a Channelized E1 Port



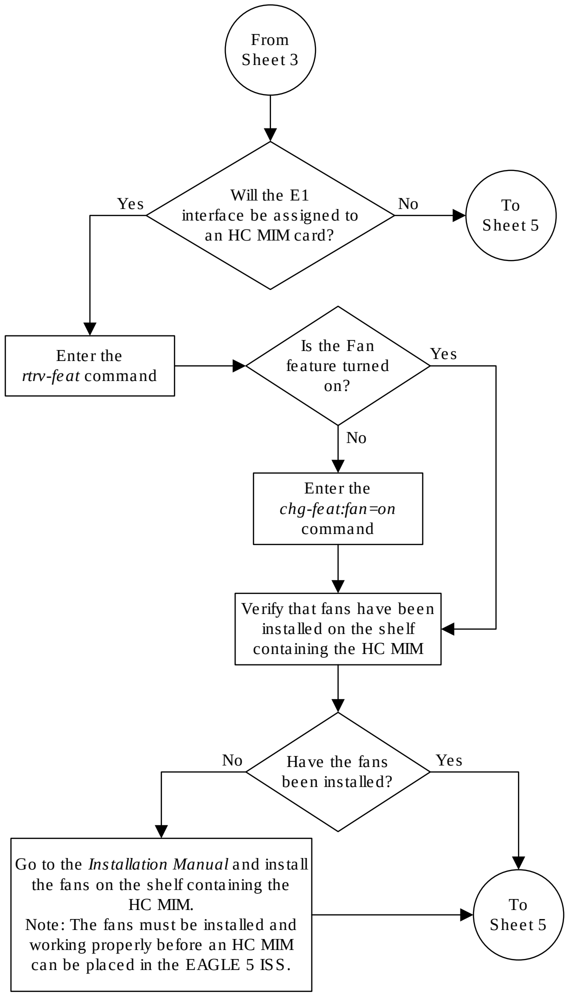
Sheet 1 of 6


To
Sheet 1
Are the values
of any of these parameters to
be changed: *encode*, *e1tsel*,
crc4, or *cas*?
No
Only the *chanbrdg*, *si*,
or *sn* parameter
values can be
changed.
Yes
To
Sheet 3
Enter the *rtrv-e1* command with these
parameters.
:loc<E1 card location>
:e1port=<E1 port on E1 card>
Enter the *rtrv-slk* command
with this parameter.
:loc<E1 card location>
Yes
Enter the *rept-stat-slk*
command with these
parameters.
:loc<E1 card location>
:link=<E1 signaling link>
Repeat this step for each
signaling link shown in the
rtrv-slk output.
Are the signaling links
serviced by the E1 port out of
service?
No
Enter the *dact-slk*
command with these
parameters.
:loc<E1 card location>
:link=<E1 signaling link>
Repeat this step for each
signaling link shown in the
rept-stat-slk output that is
not out of service.

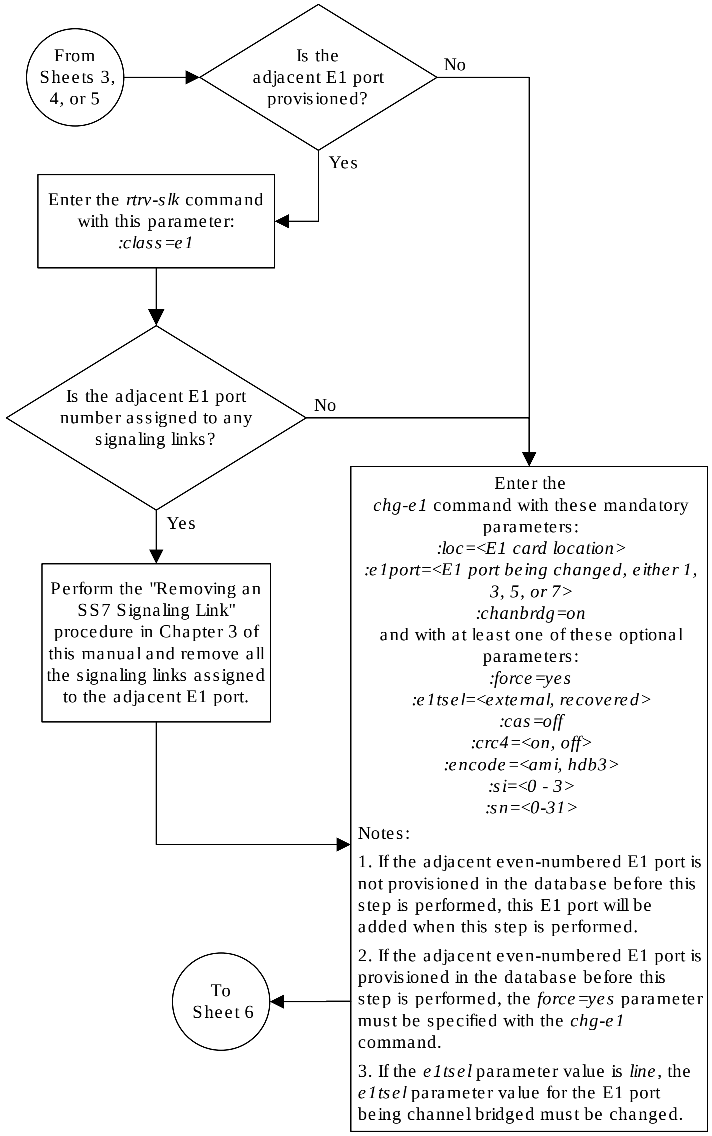
Sheet 2 of 6


From Sheet 2
Are E1 ports 3 through 8, channel bridged E1 ports, or unchannelized E1 ports, shown in the rtrv-e1 output on Sheet 1, shown on E1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 5
No
Enter the rept-stat-gpl:gpl=hipr command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the rept-stat-gpl:gpl=hipr2 command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the Installation Manual and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 4

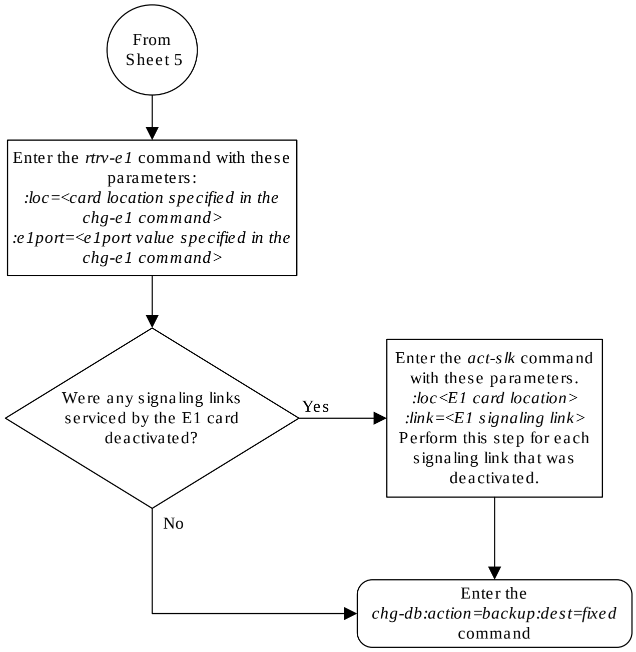
Sheet 3 of 6


From Sheet 3
Will the E1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 5
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 5

Sheet 4 of 6


From Sheets 3, 4, or 5
Is the adjacent E1 port provisioned?
No
Yes
Enter the rtrv-slk command with this parameter:
:class=e1
Is the adjacent E1 port number assigned to any signaling links?
No
Yes
Perform the "Removing an SS7 Signaling Link" procedure in Chapter 3 of this manual and remove all the signaling links assigned to the adjacent E1 port.
Enter the chg-e1 command with these mandatory parameters:
:loc=<E1 card location>
:e1port=<E1 port being changed, either 1, 3, 5, or 7>
:chanbrdg=on
and with at least one of these optional parameters:
:force=yes
:e1tsel=<external, recovered>
:cas=off
:crc4=<on, off>
:encode=<ami, hdb3>
:si=<0 - 3>
:sn=<0-31>
Notes:
1. If the adjacent even-numbered E1 port is not provisioned in the database before this step is performed, this E1 port will be added when this step is performed.
2. If the adjacent even-numbered E1 port is provisioned in the database before this step is performed, the force=yes parameter must be specified with the chg-e1 command.
3. If the e1tsel parameter value is line, the e1tsel parameter value for the E1 port being channel bridged must be changed.
To Sheet 6

Sheet 5 of 6



Sheet 6 of 6

A.13 Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port

This procedure is used to make a non-channel bridged **E1** port from a channel bridged E1 port using the `chg-e1` command. A channel bridged E1 port is an odd numbered E1 port that contains the entry `MASTER` in the `CHANBRDG` column in the `rtrv-e1` output. Other actions can be performed on E1 ports. To perform these actions on the E1 ports, perform one of these procedures.

- To change the attributes of a channelized E1 port - Changing the Attributes of a Channelized E1 Port
- To change the attributes of an unchannelized E1 port - Changing the Attributes of an Unchannelized E1 Port
- To make a channel bridged E1 port from a channelized E1 port that is not channel bridged - Making a Channel Bridged E1 Port from a Channelized E1 Port

To make a non-channel bridged E1 port from a channel bridged E1 port, these parameters are used with the `chg-e1` command.

`:loc` – The location of the E1 card (card type `lime1`) that contains the channel bridged E1 port. The location of a channel card (card type `limch`) cannot be specified for this parameter. The E1 card can be either an **HC-MIM** or an **E5-E1T1** card.

`:e1port` – The E1 port being changed in this procedure. Only the odd numbered E1 ports, 1, 3, 5, or 7, can be specified for a channel bridged E1 port.

`:crc4` – Specifies whether or not **CRC4** is enabled on the E1 signaling link.

`:cas` – Specifies whether **CAS** or **CCS** is used on the E1 signaling link. CAS is enabled with the `cas=on` parameter. CCS is enabled with the `cas=off` parameter. Only HC-MIMs or E5-E1T1 cards can contain channel bridged E1 ports. For HC-MIMs or E5-E1T1 cards, the `cas` parameter value must be `off`.

`:encode` – Specifies the type of encoding or decoding that is used on the E1 signaling link, either **HDB3** or **AMI**.

`:e1tsel` – The timing source for the E1 signaling link, master (`external`) or slave (`line`). If the `e1tsel` value for the channel bridged E1 port is `recovered`, the `e1tsel` value must be changed to either `line` or `external` when the channel bridged E1 port is changed to a non-channel bridged E1 port.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:si` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3.

`:sn` – Specifies the value of the five spare national bits of **NFAS** data, from 0 to 31.

`:chanbrdg=off` – Specifies that the odd numbered E1 port specified in this procedure is not channel bridged to its adjacent even numbered E1 port.

The E1 card specified in this procedure must be in the database. This can be verified with the `rtrv-e1` command.

If either the `crc4`, `cas`, `encode`, or `e1tsel` values are being changed, all the signaling links serviced by the E1 card must be taken out of service.

1. Display the existing **E1** interfaces in the database using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      E1                                                   LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  1     ON    OFF  HDB3    EXTERNAL  1   9   MASTER    CHAN
----
1201  2     ON    OFF  HDB3    EXTERNAL  1   9   SLAVE     CHAN
----
1203  2     OFF   OFF  HDB3    LINE      1   7   ------    CHAN
----
1211  2     ON    OFF  HDB3    LINE      0   0   ------    CHAN
----
```

A channel bridged E1 port is an odd numbered E1 port that contains the entry `MASTER` in the `CHANBRDG` column in the `rtrv-e1` output.

If there are no channel bridged E1 ports shown in the `rtrv-e1` output, this procedure cannot be performed.

If channel bridged E1 ports shown in the `rtrv-e1` output, continue the procedure by performing one of these steps.

- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are not being changed in this procedure, continue the procedure with 6.
- If the `crc4`, `cas`, `encode`, or `e1tsel` parameters are being changed in this procedure, continue the procedure with 2.

2. Display the timeslots that are serviced by the E1 card containing the E1 interface information to be changed using the `rtrv-e1` command specifying the card location and the `e1port` value of the channel bridged E1 port from 1.

For this example, enter this command.

```
rtrv-e1:loc=1201:e1port=1
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                   LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  1     ON    OFF  HDB3    EXTERNAL  1   9   MASTER    CHAN
----

TS0  (N/A)     TS8   ------    TS16  ------    TS24  ------
TS1  1201,A    TS9   ------    TS17  ------    TS25  ------
TS2  ------    TS10  ------    TS18  ------    TS26  ------
TS3  ------    TS11  ------    TS19  ------    TS27  ------
TS4  ------    TS12  ------    TS20  ------    TS28  ------
```

```
TS5  1202,A    TS13  ------    TS21  ------    TS29  ------
TS6  ------    TS14  ------    TS22  ------    TS30  ------
TS7  ------    TS15  ------    TS23  ------    TS31  ------
```

3. Display the signaling links that are assigned to the E1 card by entering the `rtrv-slk` command with the card location specified in 2. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T               PCR  PCR    E1   E1
LOC   LINK LSN         SLC TYPE    SET  BPS    ECM   N1   N2     LOC  PORT
TS
1201 B    lsn1          12 LIME1    1    56000  BASIC ---  ----- 1201 1
20
```

4. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=b`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,B   lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS      = No Alarms
  UNAVAIL REASON    = --
  E1 status         = 1201, RCVRY-E1F:FAC-E1 Port 1 available
```

   If all the signaling links shown in this step are out of service, continue the procedure with 6.

   If any of the signaling links shown in this step are in service, continue the procedure with 5.

5. Deactivate the signaling links shown in 4 using the `dact-slk` command.

   For this example, enter this command.

   `dact-slk:loc=1201:link=b`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Deactivate Link message sent to card
```

6. Change the E1 port using the `chg-e1` command and the parameter combinations shown in Table A-17.

Table A-17 Non-Channel Bridged E1 Port Parameter Combinations

Mandatory Parameters

Table A-17 (Cont.) Non-Channel Bridged E1 Port Parameter Combinations

:loc=location of the E1 card
:e1port=E1 port being changed, either 1, 3, 5, or 7
:chanbrdg=off
Optional Parameters
:cas=off
:crc4=on, off
:encode=ami, hdb3
:si=0 - 3
:sn=0 - 31
:e1tsel=line, external. If the current `e1tsel` value is `recovered`, the `e1tsel` value must be changed to either `line` or `external`.

For this example, enter this command.

```
chg-
e1:loc=1201:e1port=1:crc4=off:encode=ami:si=2:sn=6:chanbrdg=
off
```

> **Note:**
>
> When the `chanbrdg=off` parameter is specified with the `chg-e1` command, the even numbered E1 port that was channel bridged to the E1 port specified in this step is removed from the database.

7. Verify the changes using the `rtrv-e1` command specifying the card location and the `e1port` value specified in 6.

   For this example, enter these commands.

```
rtrv-e1:loc=1201:e1port=1


rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      E1                                                 LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  1     OFF   OFF  AMI     EXTERNAL  2   6   ------    CHAN
----

TS0  (N/A)    TS8   ------   TS16  ------   TS24  ------
TS1  1201,A   TS9   ------   TS17  ------   TS25  ------
TS2  ------   TS10  ------   TS18  ------   TS26  ------
TS3  ------   TS11  ------   TS19  ------   TS27  ------
TS4  ------   TS12  ------   TS20  ------   TS28  ------
TS5  1202,A   TS13  ------   TS21  ------   TS29  ------
TS6  ------   TS14  ------   TS22  ------   TS30  ------
TS7  ------   TS15  ------   TS23  ------   TS31  ------
```

If the signaling links were not deactivated in 5, continue the procedure with 9.

If the signaling links were deactivated in 5, continue the procedure with 8.

8. Activate the signaling links that were deactivated in 5 using the `act-slk` command.

   For this example, enter these commands.

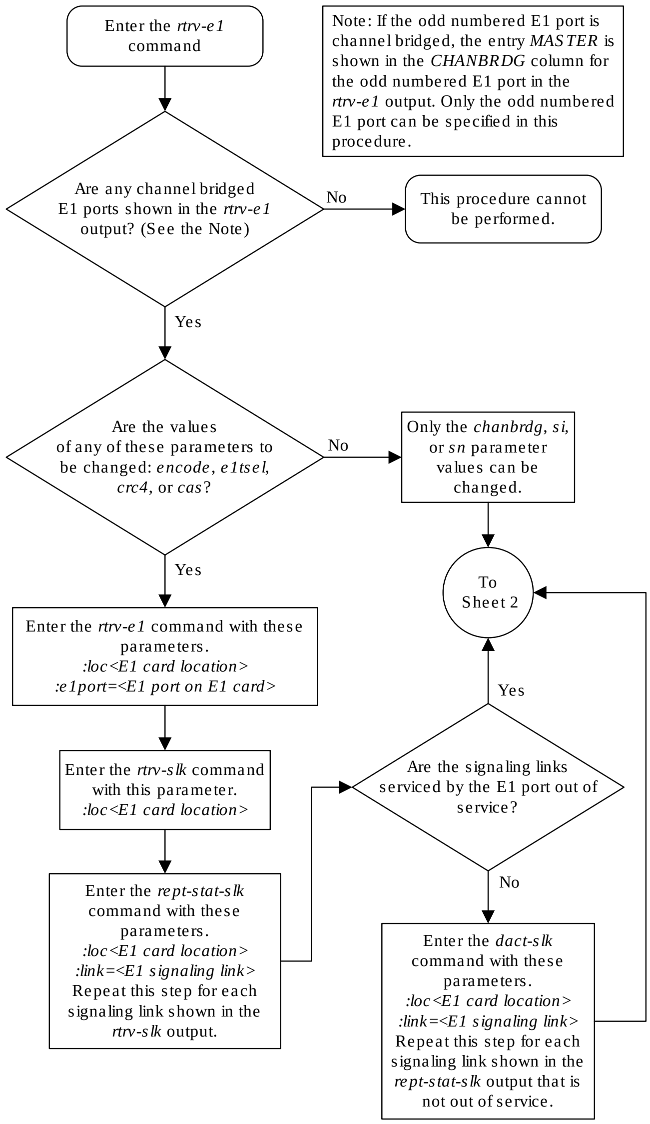
   `act-slk:loc=1201:link=b`

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

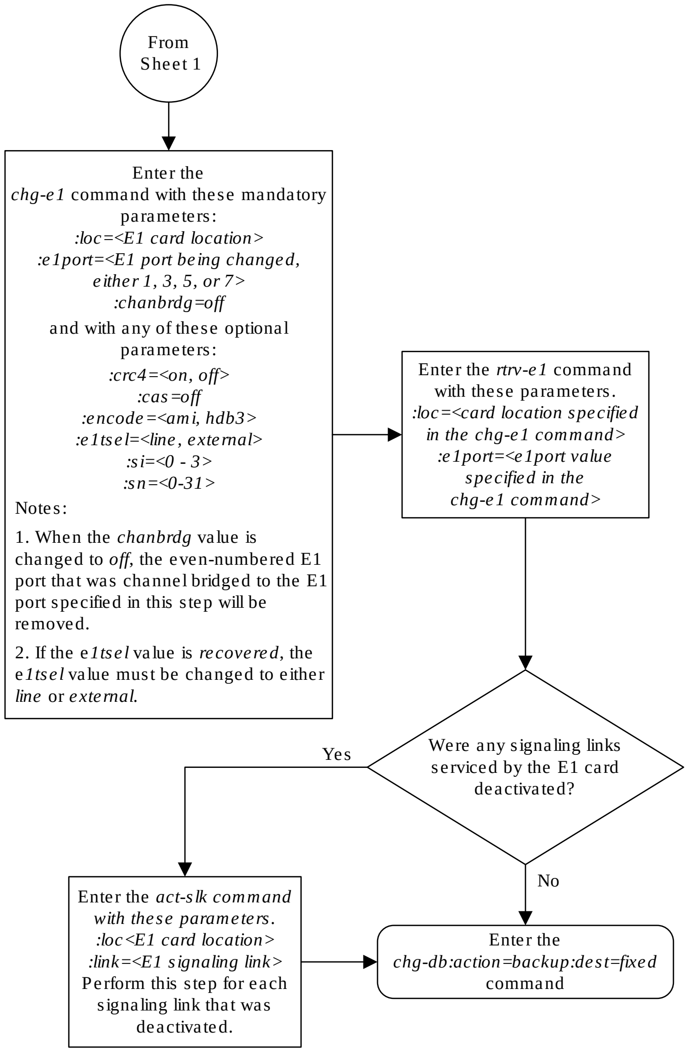
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure A-13 Making a Non-Channel Bridged E1 Port from a Channel Bridged E1 Port



Sheet 1 of 2



Sheet 2 of 2

A.14 Adding an E1 Signaling Link

This procedure is used to add an **E1** signaling link to the database using the `ent-slk` command and these parameters.

`:loc` – The card location of the card that the **E1** signaling link will be assigned to.

`:link` – The signaling link on the card specified in the `loc` parameter.

`:lsn` – The name of the linkset that will contain the signaling link.

`:slc` – The signaling link code. The **SLC** must be unique within the linkset. It must be the same at both the **EAGLE** location and the distant node.

`:bps` – The transmission rate for the link in bits per second.

`:ecm` – Error correction method, either `basic` or `pcr`. The default value for this parameter is `basic`.

`:pcrn1` – The threshold of the number of **MSUs** available for retransmission. If the error correction method being used is **PCR** (`:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISUs** are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

`:pcrn2` – The threshold of the number of **MSU** octets available for retransmission. If the error correction method being used is **PCR** (`:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISUs** are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

`:ts` – The timeslot on the **E1** card or channel card being used for the **E1** signaling link.

`:e1port` – The **E1** port on the **E1** card that is servicing the timeslot selected for the **E1** signaling link.

`:e1loc` – The location of the **E1** card servicing the timeslot selected for the **E1** signaling link. This parameter can be specified only when provisioning **E1** signaling links on channel cards.

`:l2tset` – The level 2 timer set table assigned to the **E1** signaling link. The type of linkset the **E1** signaling link is assigned to and the **E1** card's application determines the value of the `l2tset` parameter. The level 2 timer set tables are defined in Changing Level 2 Timers .

The `ent-slk` command contains other optional parameters that can be used to configure a signaling link. These parameters are not shown here because they are not necessary to provision an **E1** signaling link. These parameters are explained in more detail in Adding an SS7 Signaling Link, or in the `ent-slk` command description in *Commands User's Guide*.

These items must be configured in the database before an **E1** signaling link can be added:

- Shelf – see Adding a Shelf in *Database Administration - System Management User's Guide*
- E1 **Card** (card type `lime1`) or **ChannelCard** (card type `limch`) running either the `ss7ansi`or `ccs7itu` applications – see Adding a LIM-E1 Card procedure
- Destination **Point Code** – see the Adding a Destination Point Code procedure.
- Linkset – Adding an SS7 Linkset .

Verify that the link has been physically installed (all cable connections have been made).

Timeslot 16 (ts=16) cannot be specified for an **E1** signaling link if the **E1** interface servicing this link has **CAS** enabled. This is shown by the entry on in the CAS field of the rtrv-e1 output.

If the **E1** signaling link is assigned to a channel card (card type limch), the e1port parameter cannot be specified. The e1port parameter value defaults to 1.

All **E1** signaling links in a linkset can use either the 56000 or 64000 transmission rate. The transmission rate for the **E1** signaling links in the linkset do not have to be the same.

The values for the ts parameter must be from 1 to 31.

The linkset must be in the database. The number of signaling links in a linkset cannot exceed 16. This can be verified with the rtrv-ls command.

The **APC** of the linkset assigned to the signaling link must be in the **SS7** domain. Use the rtrv-dstn command to verify the domain of the **APC** of the linkset.

The pcrn1 or pcrn2 parameters can only be specified if the ecm=pcr parameter is specified.

If the **E1** signaling link is being assigned to an unchannelized **E1** port (shown by the entry UNCHAN in the LINKCLASS field in the rtrv-e1 output), you cannot specify the ts parameter. An **E1** signaling link containing an unchannelized **E1** port can be assigned only to an **HC**-**MIM** or an **E5-E1T1** card. A maximum of two **E1** signaling links containing an unchannelized **E1** port can be assigned to an **HC**-**MIM**. The link parameter value for these links must be either a or b. A maximum of one **E1** signaling link containing an unchannelized **E1** port can be assigned to an **E5-E1T1** card. The link parameter value for this link must be a. The transmission rate (bps parameter) for an unchannelized **E1** signaling link is 1984000 bits per second. The bps parameter is optional, and if not specified with the ent-slk command, the bps parameter value defaults to 1984000 bits per seconds.

If the **E1** signaling link is being assigned to a channel bridged **E1** port (shown by the entries MASTER or SLAVE in the CHANBRDG field in the rtrv-e1 output), the **E1** port value for the signaling link must be the odd numbered (MASTER) **E1** port.

If the **E1** card is not an **HC**-**MIM** or an **E5-E1T1** card, a maximum of 2 or 8 **E1** signaling links can be assigned to the card. The range of link parameter values is dependent on the type of **E1** card the signaling link is assigned to. If the **E1** card is an **E1**/**T1MIM**, the link parameter values are A - A3, or B - B3, allowing a maximum of 8 signaling links on the card.

If the **E1** signaling link is being assigned to a channelized **E1** port (shown by the entry CHAN in the LINKCLASS field in the rtrv-e1 output) on an **HC**-**MIM**, the link parameter values are A - A31 or B - B31. An **HC**-**MIM** can contain a maximum of 64 channelized **E1** signaling links. If signaling links A16 to A31, or B16 to B31 will be assigned to the card, the **FAN** feature must be turned on. The status of the **FAN** feature is shown in the rtrv-feat command output. The shelf containing the **HC**-**MIM** being added in this procedure must have fans installed. If the fans are not installed on the shelf containing the **HC**-**MIM**, go to *Installation Guide* and install the fans.

If the **E1** signaling link is being assigned to a channelized **E1** port (shown by the entry CHAN in the LINKCLASS field in the rtrv-e1 output) on an **E5-E1T1** card, the link parameter values are A - A15 or B - B15. An **E5-E1T1** card can contain a maximum of 32 channelized **E1** signaling links.

To configure the **EAGLE** to perform circular routing detection test on the signaling links, perform the Configuring Circular Route Detection procedure.

> **Note:**
>
> Circular route detection is not supported in **ITU** networks.

To provision a **EAGLE** with more than 1200 signaling links, the **EAGLE** must have certain levels of hardware installed. See the Requirements for EAGLEs Containing more than 1200 Signaling Links section for more information on these hardware requirements.

The **EAGLE** can contain a mixture of low-speed, **E1**, **T1**, **ATM** high-speed, and **IP** signalling links. The Determining the Number of High-Speed and Low-Speed Signaling Links section describes how to determine the quantities of the different types of signaling links the **EAGLE** can have.

Configuring Signaling Links on LIM-E1 Cards

The main consideration for the provisioning of **LIM-E1** cards into the **EAGLE** is to determine the number of **LIM-E1** cards existing in the network and the equipment needed for expanding the signaling link capacity of the **EAGLE**. To utilize the flexibility of the **E1** interface feature, you may want to determine the minimum number of **LIM-E1** cards needed to process the total number of **SS7** links and then consider diversity for reliability reasons.

Use the following points as guidelines when considering diversity for **E1**:

- If possible, no two **LIM-E1** cards containing links from a common link set should be on the same **E1**/dual port **ChannelCard**.
- If possible, no two **LIM-E1** cards containing links from a common link set should be on adjacent **E1**/dual port **Channel** Cards where they are powered from the same fuse position.
- If possible, no two **LIM-E1** cards containing links from a common link set should be terminated on the same shelf because of the shelf clock cabling, and is only an issue if using master clocking sync to the network
- If possible, no two links in a link set should arrive at the **EAGLE** on the same **LIM-E1** card.
- If possible, for link sets containing more than two links, you should minimize the number of links in that link set on any given **LIM-E1** card.

As an example, consider a network consisting of 30 **LIM-E1** cards with a total number of 100 links where the largest link set size is 8. The most efficient way to provision the **EAGLE** would be to have 4 extension shelves equipped with the **E1** Cabling Backplane, 1 **E1Card**, and 12 **Channel** Cards per shelf. Utilizing 1 “B” bus on each shelf, 25 signaling links would be terminated on each shelf for a total of 100. *This is also the minimum number of* **LIM-E1** *Cards required for this example.*

With the same example but using the third and fifth bullets above as a consideration, the **EAGLE** would be provisioned with 8 extension shelves equipped with the **E1** Cabling Backplane. Four of the shelves would be equipped with 1 **E1Card** and 6 **Channel** Cards, and the other 4 shelves would be equipped with 1 **E1Card** and 5 **Channel** Cards. *Since the largest link set size is 8, a total of 8* **LIM-E1** *Cards is required.* Utilizing 1 “B” bus on each shelf, 13 signaling links would be terminated on each shelf with 6 **Channel** Cards, and 12 signaling links would be terminated on each shelf with 5 **Channel** Cards.

Example Signaling Link Configuration

This examples used in this procedure are based on Table A-18.

Table A-18 E1 Signaling Link Configuration Table

SLK LOC	SLK LINK	LSN	SLC	TYPE	BPS	TS	E1PORT	E1LOC
1201	A	**LSNE12**	0	**LIME1**	64000	1	2	N/A
1202	A	**LSNE12**	1	**LIMCH**	64000	5	1	1201
1203	A	**LSNE13**	0	**LIME1**	64000	8	2	N/A
1204	A	**LSNE13**	1	**LIMCH**	64000	12	1	1203
1211	A	**LSNE145**	0	**LIME1**	56000	10	2	N/A
1212	A	**LSNE145**	1	**LIMCH**	56000	14	1	1211
1212	A	**LSNE145**	2	**LIMCH**	56000	20	1	1211
1301	A	**LSN6**	0	**LIME1**	1984000	N/A	4	N/A
1303	B	**LSN7**	0	**LIME1**	1984000	N/A	7	N/A

Canceling the `REPT-STAT-SLK` and `RTRV-SLK` Commands

Because the `rept-stat-slk` and `rtrv-slk` commands used in this procedure can output information for a long period of time, the `rept-stat-slk` and `rtrv-slk` commands can be canceled and the output to the terminal stopped. There are three ways that the `rept-stat-slk` and `rtrv-slk` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered, from another terminal other that the terminal where the `rept-stat-slk` or `rtrv-slk` commands was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands User's Guide*.

1. Display the cards in the database using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD    TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102    TSM       GLS
1113    GSPM      OAM
1114    TDM-A
1115    GSPM      OAM
1116    TDM-B
1117    MDAL
```

```
1201   LIME1     CCS7ITU
1202   LIMCH     CCS7ITU
1203   LIME1     CCS7ITU
1204   LIMCH     CCS7ITU
1211   LIME1     CCS7ITU
1212   LIMCH     CCS7ITU
```

If the required **E1** card or channel card is not in the database, perform Adding a LIM-E1 Card to add the required cards to the database.

2. Display the current linkset configuration using the `rtrv-ls` command.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0
                                 L3T SLT              GWS GWS GWS
LSN          APCA   (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsnt145      150-075-038   scr4  1   1   yes  a  0    on  on  off
---   ---
lsnt265      200-150-067   scr2  1   1   yes  a  3    on  on  off
---   ---

                                 L3T SLT              GWS GWS GWS
LSN          APCI   (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsne12       2-150-7       scr1  1   1   no  a   2    on  on  off
---   ---
lsne145      4-049-3       scr1  1   1   no  a   3    on  on  off
---   ---
sp5          1-111-3       scr3  1   3   yes c   1    off off off
---   ---
sp6          1-111-1       scr1  1   1   yes a   1    off off off
---   ---
sp7          1-111-2       scr2  1   2   no  a   2    on  on  on
---   ---

                                 L3T SLT              GWS GWS GWS
LSN          APCN   (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsne13       14950         scr1  1   1   no  a   2    on  on  off
---   off
nsp1         11111         scr1  1   1   yes a   2    off off off
---   off
nsp3         11112         scr2  1   2   no  a   1    on  on  on
---   off
nsp4         11113         scr3  1   3   yes c   1    off off off
---   off

Link set table is ( 11 of 1024)  1% full
```

If the desired linkset is not in the database, perform Adding an SS7 Linkset to add the linkset to the database. After the linkset has been added to the database, continue the procedure with 4.

If the desired linkset is in the database, continue the procedure with 3.

3. Display the attributes of the linkset that will contain the new signaling link by entering the `rtrv-ls` command with the name of the linkset shown in 2. For this example, enter these commands.

```
rtrv-ls:lsn=lsne12


rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                L3T SLT              GWS GWS GWS
LSN           APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsne12        2-150-7        scr1 1   1   yes A   2    on  on  off no
off

              SPCI           CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  2          ---    ---

           SLSRSB RANDSLS ITUTFR
           1      off     off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no

                                 L2T              PCR  PCR   E1   E1
           LOC  LINK SLC TYPE     SET  BPS    ECM  N1   N2    LOC  PORT
TS
           1201 A1   2   LIME1    11   56000  BASIC ---  ----- 1201 2
20
           1201 B    3   LIME1    11   56000  BASIC ---  ----- 1201 2
10


Link set table is (11 of 1024) 1% full.

rtrv-ls:lsn=lsne13


rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                L3T SLT              GWS GWS GWS
LSN           APCN    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsne13        14950          scr1 1   1   no  A   2    on  on  off no
off

              SPCN           CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          ---    ---

           SLSRSB RANDSLS ITUTFR
           1      off     off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no
```

```
                                  L2T               PCR  PCR   E1
E1
           LOC  LINK SLC TYPE     SET  BPS    ECM   N1   N2    LOC
PORT TS
           1203 A1   2   LIME1    11   56000  BASIC ---  ----- 1203
2    4
           1203 A3   3   LIME1    11   56000  BASIC ---  ----- 1203
2    3

Link set table is (11 of 1024) 1% full.

rtrv-ls:lsn=lsne145


rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCI   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsne145       4-049-3       scr1 1   1   yes A   3    on  on  off
no    off

              SPCI          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  2          ---    ---

           SLSRSB RANDSLS ITUTFR
           1      off     off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    no       CdPA               no

                                  L2T               PCR  PCR   E1
E1
           LOC  LINK SLC TYPE     SET  BPS    ECM   N1   N2    LOC
PORT TS
           1211 A1   3   LIME1    11   56000  BASIC ---  ----- 1211
2    17
           1211 B    4   LIME1    11   56000  BASIC ---  ----- 1211
2    13
           1211 B1   5   LIME1    11   56000  BASIC ---  ----- 1211
2    2


Link set table is (11 of 1024) 1% full.
```

The signaling link cannot be assigned to a linkset whose `IPSG` or `IPGWAPC` values are `yes`. If either the `IPSG` or `IPGWAPC` value for the linkset is `yes`, repeat the procedure from 2 and choose another linkset.

If the `IPSG` and `IPGWAPC` values for the linkset are `no`, continue the procedure with 4.

4. Display the current signaling link configuration using the `rtrv-slk` command.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0
                                  L2T                PCR   PCR
LOC   LINK LSN          SLC TYPE      SET  BPS     ECM    N1    N2
1201 A    e3m1s1       0   LIMDS0    1    56000   BASIC ---- ------
1201 B    e3m1s2       0   LIMDS0    1    56000   BASIC ---- ------
1202 A    e3m1s1       1   LIMDS0    1    56000   BASIC ---- ------
1202 B    e3m1s2       1   LIMDS0    1    56000   BASIC ---- ------
1203 A    e3m1s1       2   LIMDS0    1    56000   BASIC ---- ------
1203 B    e3m1s2       2   LIMDS0    1    56000   BASIC ---- ------
1204 A    e3m1s1       3   LIMDS0    1    56000   BASIC ---- ------
1204 B    e3m1s2       3   LIMDS0    1    56000   BASIC ---- ------
1205 A    e3m1s1       4   LIMDS0    1    56000   BASIC ---- ------
1205 B    e3m1s2       4   LIMDS0    1    56000   BASIC ---- ------
1206 A    e3m1s1       5   LIMDS0    1    56000   BASIC ---- ------
1206 B    e3m1s2       5   LIMDS0    1    56000   BASIC ---- ------
1207 A    e3m1s1       6   LIMDS0    1    56000   BASIC ---- ------
1207 B    e3m1s2       6   LIMDS0    1    56000   BASIC ---- ------
1211 A    e3m2s1       0   LIMDS0    11   56000   BASIC ---- ------
1211 B    e3m2s2       0   LIMDS0    11   56000   BASIC ---- ------
1212 A    e3m2s1       1   LIMDS0    11   56000   BASIC ---- ------
1212 B    e3m2s2       1   LIMDS0    11   56000   BASIC ---- ------
1213 A    e3m2s1       2   LIMDS0    11   56000   BASIC ---- ------
1213 B    e3m2s2       2   LIMDS0    11   56000   BASIC ---- ------
1214 A    e3m2s1       3   LIMDS0    11   56000   BASIC ---- ------
1214 B    e3m2s2       3   LIMDS0    11   56000   BASIC ---- ------
1215 A    e3m2s1       4   LIMDS0    11   56000   BASIC ---- ------
1215 B    e3m2s2       4   LIMDS0    11   56000   BASIC ---- ------
1216 A    e3m2s1       5   LIMDS0    11   56000   BASIC ---- ------
1216 B    e3m2s2       5   LIMDS0    11   56000   BASIC ---- ------
1217 A    e3m2s1       6   LIMDS0    11   56000   BASIC ---- ------
1217 B    e3m2s2       6   LIMDS0    11   56000   BASIC ---- ------

SLK TABLE is ( 28 of 1200) 2% full.
```

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have (in this example, the maximum number of signaling links is 1200), and the maximum number of signaling links is 2800, this procedure cannot be performed. The EAGLE cannot contain more than 2800 signaling links.

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have, and the maximum number of signaling links is less than 2800, perform the Enabling the Large System # Links Controlled Feature procedure to enable the desired quantity of signaling links.

If the addition of the new signaling link will not exceed the maximum number of signaling links the EAGLE can have, or if a new signaling link quantity was enabled, continue the procedure by performing one of these steps.

- If the signaling link will be assigned to a channel card (LIMCH), continue the procedure with 10.
- If the signaling link will be assigned to a LIME1 card, continue the procedure with 5.

5. Display the **E1** interfaces that will be assigned to the **E1** signaling link using the `rtrv-e1` command with no parameters.

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
      E1                                                        LINK
MINSU
LOC   PORT  CRC4  CAS  ENCODE  E1TSEL    SI  SN  CHANBRDG  CLASS
RATE
1201  2     ON    OFF  HDB3    LINE      0   0   ------    CHAN
----
1203  1     OFF   ON   HDB3    EXTERNAL  3   6   ------    CHAN
----
1211  2     ON    OFF  HDB3    LINE      0   0   ------    CHAN
----
```

If the desired E1 port and E1 card combination is shown in the `rtrv-e1` output, continue the procedure with 6.

If the desired **E1** port and **E1** card combination is not shown in the `rtrv-e1` output, add the **E1** port and **E1** card combination to the database by performing the one of these procedures:

- Adding Channelized and non-Channel Bridged E1 Ports
- Adding Channel Bridged E1 Ports
- Adding Unchannelized E1 Ports.

After the desired E1 port and E1 card combination has been added to the database, continue the procedure with 6.

6. Verify the card type of the card that will contain the new E1 signaling link by entering this command.

`rtrv-stp:type=lime1`

```
rlghncxa03w 08-12-30 11:07:17 EST  EAGLE 40.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL
GPL Version
----  -----------  ---  -------------  ----     --    ----
-----------

1201  870-2671-02  C    10145689323    LIME1    512M  SS7ANSI
126-034-000
1203  870-1873-01  C    10345690569    LIME1    512M  SS7ANSI
126-034-000
1211  870-1873-01  C    10346790570    LIME1    512M  SS7ANSI
126-034-000
1301  870-2671-02  C    10145689327    LIME1    512M  SS7ANSI
126-033-000
1303  870-1873-01  C    10345691349    LIME1    512M  SS7ANSI
126-033-000

Command Completed.
```

The **E1** card types and their part numbers are shown in Table A-4.

If the new E1 signaling link will be assigned to an E1T1 MIM, or E5-E1T1 card, continue the procedure with 10.

If the new E1 signaling link will be assigned to an HC-MIM, and the `link` parameter value of the new signaling link is A-A15 or B-B15, continue the procedure with 10.

If the new E1 signaling link will be assigned to an HC-MIM, and the `link` parameter value of the new signaling link is A16-A31 or B16-B31, continue the procedure by performing one of these steps.

- If the `link` parameter values A16-A31 or B16-B31 are shown in the `rtrv-slk` output in 4, and the new signaling link will be assigned to a card on the same shelf as the cards the contain the `link` parameter values A16-A31 or B16-B31, continue the procedure with 10.
- If the `link` parameter values A16-A31 or B16-B31 are shown in the `rtrv-slk` output in 4, and the new signaling link will be assigned to a card that is not on the same shelf as the cards the contain the `link` parameter values A16-A31 or B16-B31, continue the procedure with 9.
- If the `link` parameter values A16-A31 or B16-B31 are not shown in the `rtrv-slk` output in 4, continue the procedure with 7.

7. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command.

   If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 9.

8. Turn the Fan feature on by entering this command.

   ```
   chg-feat:fan=on
   ```

   > **Note:**
   >
   > Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Oracle Sales Representative or Account Representative.

9. The shelf containing the **HC-MIM** being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

   If the fans are installed, continue the procedure with 10.

If the fans are not installed on the shelf containing the **HC-MIM**, go to *Installation Guide* and install the fans. Once the fans have been installed and tested, 10 . The fans must be working properly before an **HC-MIM** can be placed in the **EAGLE**.

10. Add the **E1** signaling links using the `ent-slk` command.

    Enter the `ent-slk` command with the parameter combinations shown in Table A-19.

Table A-19 E1 Signaling Link Parameter Combinations

E1 Signaling Links assigned to a Channel Card	E1 Signaling Links assigned to an E1/T1 MIM	E1 Signaling Links assigned to an HC-MIM with a Channelized E1 Port	E1 Signaling Links assigned to an HC-MIM with an Unchannelized E1 Port	E1 Signaling Links assigned to an E5-E1T1 Card with a Channelized E1 Port	E1 Signaling Links assigned to an E5-E1T1 Card with an Unchannelized E1 Port
Mandatory Parameters					
:loc=<the location of the channel card>	:loc=<the location of the LIME1 card>	:loc=<the location of the LIME1 card>	:loc=<the location of the LIME1 card>	:loc=<the location of the LIME1 card>	:loc=<the location of the LIME1 card>
:link=A - A3, B - B3	:link=A - A3, B - B3	:link=A - A31, B - B31 (See Note 2)	:link=A or B	:link=A - A15, B - B15	:link=A
:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>
:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15
:e1loc=<the location of the LIME1 card>	:e1port= 1 or 2	:e1port= 1 - 8	:e1port= 1 - 8	:e1port= 1 - 8	:e1port= 1 - 8
:ts= 1 - 31 (See Note 1)	:ts= 1 - 31 (See Note 1)	:ts= 1 - 31		:ts= 1 - 31	
Optional Parameters					
:bps=56000, 64000	:bps=56000, 64000	:bps=56000, 64000	:bps=1984000	:bps=56000, 64000	:bps=1984000
Default value = 56000	Default value = 56000	Default value = 56000	Default value = 1984000	Default value = 56000	Default value = 1984000
:ecm=basic, pcr	:ecm=basic, pcr	:ecm=basic, pcr	:ecm=basic, pcr	:ecm=basic, pcr	:ecm=basic, pcr
Default value = basic	Default value = basic	Default value = basic	Default value = basic	Default value = basic	Default value = basic
:pcrn1= 1 - 127 (See Note 3)	:pcrn1= 1 - 127 (See Note 3)	:pcrn1= 1 - 127 (See Note 3)	:pcrn1= 1 - 127 (See Note 3)	:pcrn1= 1 - 127 (See Note 3)	:pcrn1= 1 - 1023 (See Note 3)
Default value = 76	Default value = 76	Default value = 76	Default value = 76	Default value = 76	Default value = 608
:pcrn2=300 - 35500 (See Note 3)	:pcrn2=300 - 35500 (See Note 3)	:pcrn2=300 - 35500 (See Note 3)	:pcrn2=300 - 35500 (See Note 3)	:pcrn2=300 - 35500 (See Note 3)	:pcrn2=7200 - 287744 (See Note 3)
Default value = 3800	Default value = 3800	Default value = 3800	Default value = 3800	Default value = 3800	Default value = 32224

Table A-19 (Cont.) E1 Signaling Link Parameter Combinations

E1 Signaling Links assigned to a Channel Card	E1 Signaling Links assigned to an E1/T1 MIM	E1 Signaling Links assigned to an HC-MIM with a Channelized E1 Port	E1 Signaling Links assigned to an HC-MIM with an Unchannelized E1 Port	E1 Signaling Links assigned to an E5-E1T1 Card with a Channelized E1 Port	E1 Signaling Links assigned to an E5-E1T1 Card with an Unchannelized E1 Port
:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16

Notes:

1. Timeslot 16 cannot be used if the E1 interface, defined by the `e1loc` and `e1port` parameter values, has CAS enabled (`cas=on`). This is shown in the `rtrv-e1` output.

2. If the Fan feature is not turned on, the `link` parameter values for an E1 signaling link are A - A15, B - B15.

3. The `pcrn1` and `pcrn2` parameters can be specified only if the `ecm=pcr` parameter is specified.

If the **E1** signaling link is being assigned to an unchannelized **E1** port (shown by the entries `UNCHAN` in the `LINKCLASS` field in the `rtrv-e1` output), you cannot specify the `ts` parameter. The transmission rate (`bps` parameter) for an unchannelized **E1** signaling link is 1984000 bits per second. The `bps` parameter is optional, and if not specified with the `ent-slk` command, the `bps` parameter value defaults to 1984000 bits per seconds. It is recommended that unchannelized **E1** signaling links are assigned to linksets that do not contain other types of signaling links.

For this example, enter these commands.

```
ent-slk:loc=1201:link=a:lsn=lsne12:slc=2:bps=64000:ts=1:e1port=2

ent-
slk:loc=1202:link=a:lsn=lsne12:slc=3:bps=64000:ts=5:e1loc=1201

ent-slk:loc=1203:link=a:lsn=lsne13:slc=2:bps=64000:ts=8:e1port=2

ent-
slk:loc=1204:link=a:lsn=lsne13:slc=3:bps=64000:ts=12:e1loc=1203

ent-
slk:loc=1211:link=a:lsn=lsne145:slc=3:bps=56000:ts=10:e1port=2

ent-
slk:loc=1212:link=a:lsn=lsne145:slc=4:bps=56000:ts=14:e1loc=1211

ent-
slk:loc=1212:link=a2:lsn=lsne145:slc=5:bps=56000:ts=20:e1loc=1211

ent-slk:loc=1301:link=a:lsn=lsn6:slc=0:e1port=4

ent-slk:loc=1303:link=b:lsn=lsn7:slc=0:e1port=7
```

Note:

If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the `rtrv-measopts` output is `on`, the scheduled UI measurement reports will be disabled.

11. Verify the changes using the `rtrv-slk` command, specifying the card location and signaling link entered in 10 .

    For this example, enter these commands.

    `rtrv-slk:loc=1201`

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
                                   L2T                  PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM    N1   N2
LOC  PORT TS
1201 A    lsne12        2  LIME1    1    64000  BASIC ---  -----
1201 2    1
```

    `rtrv-slk:loc=1202`

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
                                   L2T                  PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM    N1   N2
LOC  PORT TS
1202 A    lsne12        3  LIMCH    1    64000  BASIC ---  -----
1201 1    5
```

    `rtrv-slk:loc=1203`

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
                                   L2T                  PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM    N1   N2
LOC  PORT TS
1203 A    lsne13        2  LIME1    1    64000  BASIC ---  -----
1203 2    8
```

    `rtrv-slk:loc=1204`

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
                                   L2T                  PCR  PCR
E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS    ECM    N1   N2
LOC  PORT TS
1204 A    lsne13        3  LIMCH    1    64000  BASIC ---  -----
1203 1    12
```

    `rtrv-slk:loc=1211`

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
```

```
                                   L2T                PCR  PCR    E1   E1
LOC  LINK LSN          SLC TYPE    SET  BPS     ECM   N1   N2     LOC  PORT
TS
1211 A    lsne145       3  LIME1   1    56000   BASIC ---  ----- 1211 2
10
```

```
rtrv-slk:loc=1212
```

```
rlghncxa03w 08-12-19 21:17:04 GMT EAGLE5 40.0.0
                                   L2T                PCR  PCR    E1   E1
LOC  LINK LSN          SLC TYPE    SET  BPS     ECM   N1   N2     LOC  PORT
TS
1212 A    lsne145       4  LIMCH   1    56000   BASIC ---  ----- 1211 1
14
1212 A2   lsne145       5  LIMCH   1    56000   BASIC ---  ----- 1211 1
20
```

```
rtrv-slk:loc=1301
```

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
                                   L2T                PCR  PCR    E1   E1
LOC  LINK LSN          SLC TYPE    SET  BPS     ECM   N1   N2     LOC  PORT
TS
1301 A    lsn6         0   LIME1   1    1.984M BASIC ---  ----- 1301 4
--
```

```
rtrv-slk:loc=1303
```

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
                                   L2T                PCR  PCR    E1   E1
LOC  LINK LSN          SLC TYPE    SET  BPS     ECM   N1   N2     LOC  PORT
TS
1303 B    lsn7         0   LIME1   1    1.984M BASIC ---  ----- 1303 7
--
```

If any of the cards shown in this step contain the first signaling link on a card, continue the procedure with 12.

If signaling links were assigned to all the cards shown in this step when 10 was performed, continue the procedure with 13.

12. Bring the cards into service with the `rst-card` command, specifying the card location specified in 11 . For this example, enter these commands.

    `rst-card:loc=1202`

    `rst-card:loc=1204`

    `rst-card:loc=1212`

    `rst-card:loc=1301`

    `rst-card:loc=1303`

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-23 13:05:05 GMT EAGLE5 36.0.0
Card has been allowed.
```

13. Activate all signaling links on the cards using the `act-slk` command, specifying the card location and signaling link specified in 11 . For this example, enter these commands.

    `act-slk:loc=1201:link=a`

    `act-slk:loc=1202:link=a`

    `act-slk:loc=1203:link=a`

    `act-slk:loc=1204:link=a`

    `act-slk:loc=1211:link=a`

    `act-slk:loc=1212:link=a`

    `act-slk:loc=1212:link=a2`

    `act-slk:loc=1301:link=a`

    `act-slk:loc=1303:link=b`

    When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:31:24 GMT  EAGLE5 36.0.0
Activate Link message sent to card
```

14. Check the status of the signaling links added in 10 using the `rept-stat-slk` command with the card location and signaling link. The state of each signaling link should be in service normal (**IS-NR**) after the link has completed alignment (shown in the `PST` field). For this example, enter these commands.

    `rept-stat-slk:loc=1201:link=a`

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN        CLLI         PST          SST        AST
1201,A   lsne12     ----------- IS-NR        Avail      ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 2 available
```

    `rept-stat-slk:loc=1202:link=a`

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN        CLLI         PST          SST        AST
1202,A   lsne12     ----------- IS-NR        Avail      ----
  ALARM STATUS       = No Alarms
```

```
  UNAVAIL REASON     = --
  E1 status          = 1201, RCVRY-E1F:FAC-E1 Port 1 available
```

```
rept-stat-slk:loc=1203:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1203,A  lsne12    ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1203, RCVRY-E1F:FAC-E1 Port 2 available
```

```
rept-stat-slk:loc=1204:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1204,A  lsne12    ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1203, RCVRY-E1F:FAC-E1 Port 1 available
```

```
rept-stat-slk:loc=1211:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1211,A  lsne145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1211, RCVRY-E1F:FAC-E1 Port 2 available
```

```
rept-stat-slk:loc=1212:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1212,A  lsne145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1211, RCVRY-E1F:FAC-E1 Port 1 available
```

```
rept-stat-slk:loc=1212:link=a2
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1212,A2 lsne145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
```

```
  UNAVAIL REASON     = --
  E1 status          = 1211, RCVRY-E1F:FAC-E1 Port 1 available
```

```
rept-stat-slk:loc=1301:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK     LSN       CLLI        PST          SST       AST
1303,A  lsn6      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1301, RCVRY-E1F:FAC-E1 Port 4 available
```

```
rept-stat-slk:loc=1303:link=b
```

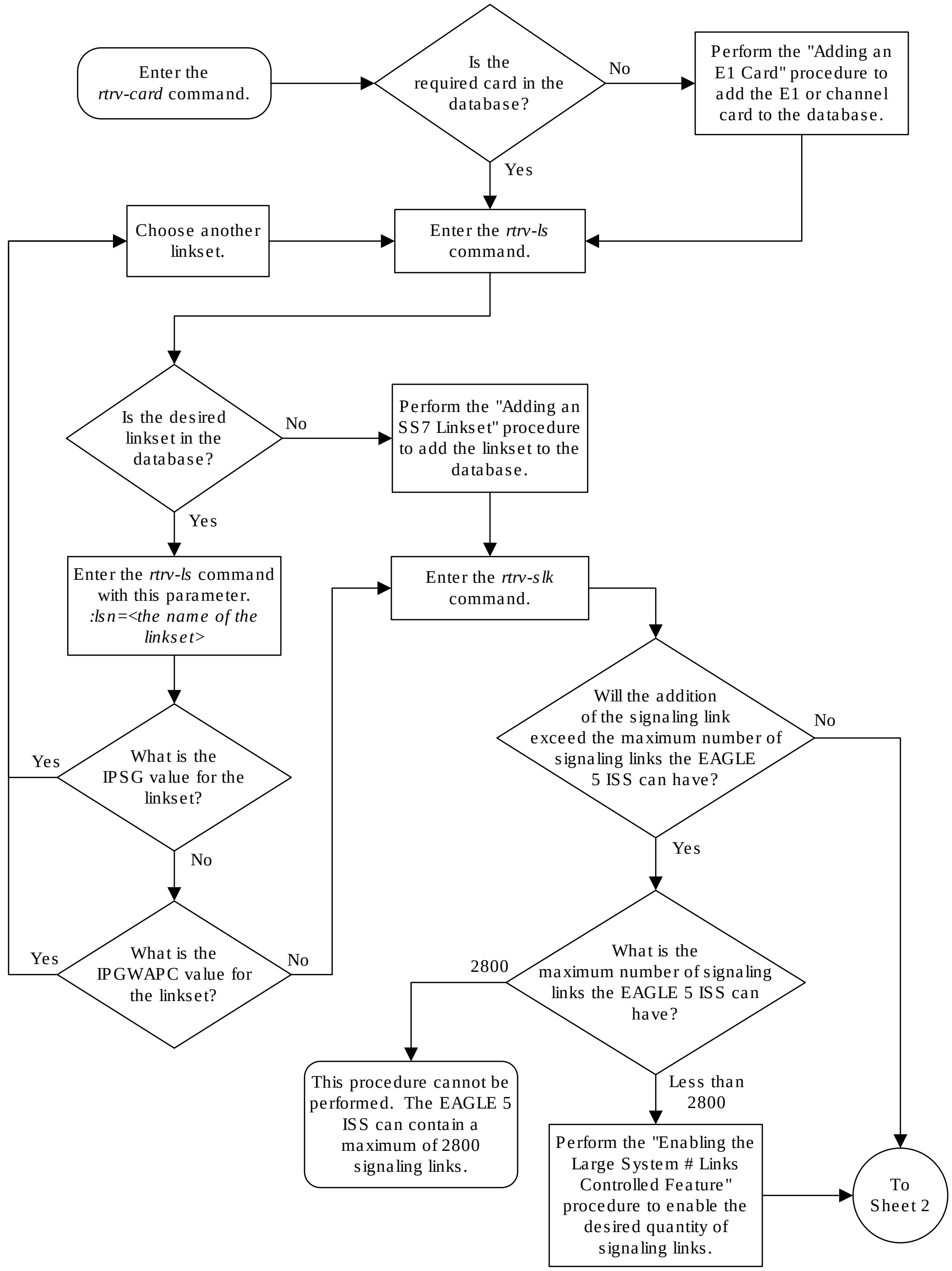
```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK     LSN       CLLI        PST          SST       AST
1303,B  lsn7      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  E1 status          = 1303, RCVRY-E1F:FAC-E1 Port 7 available
```

15. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

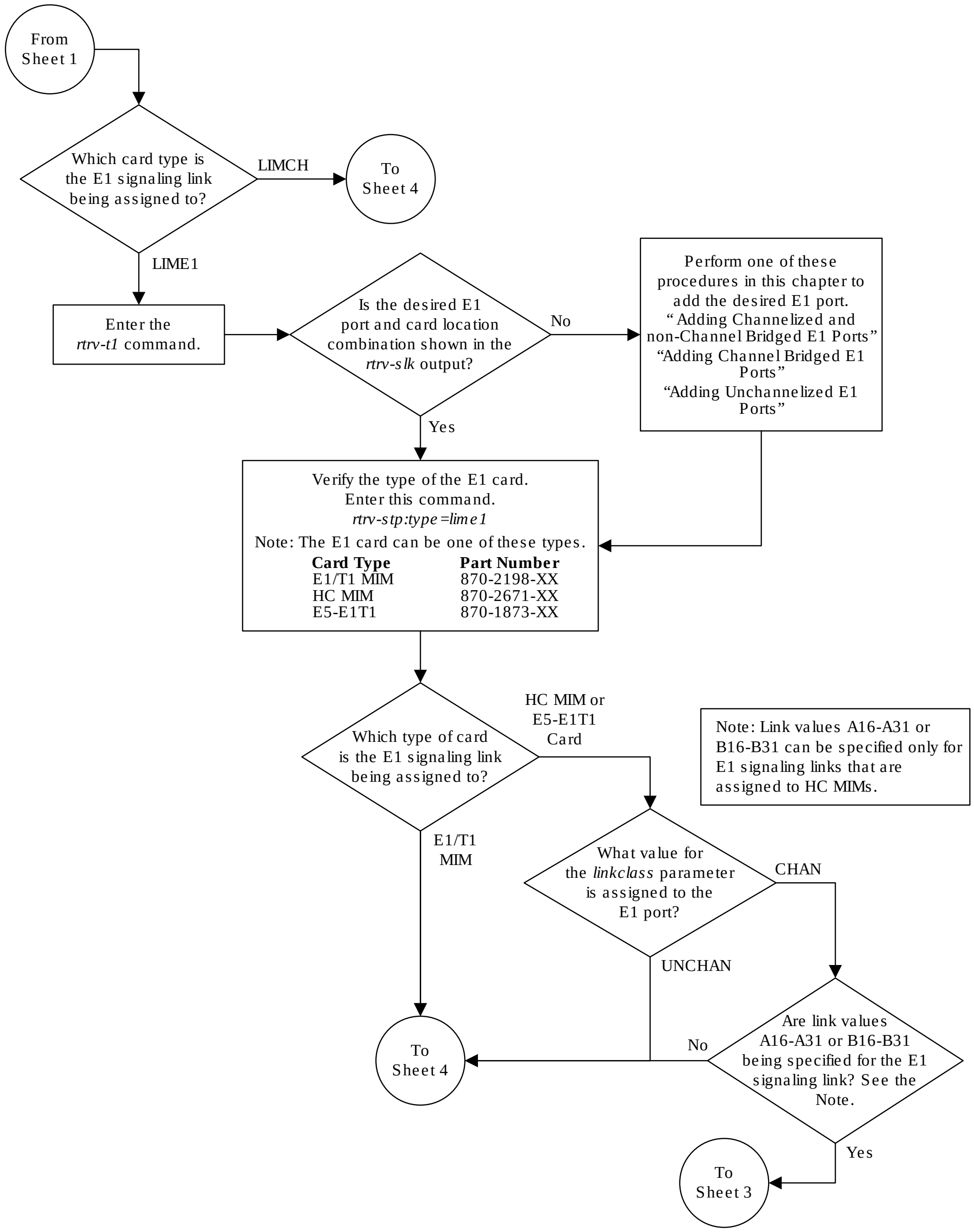
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

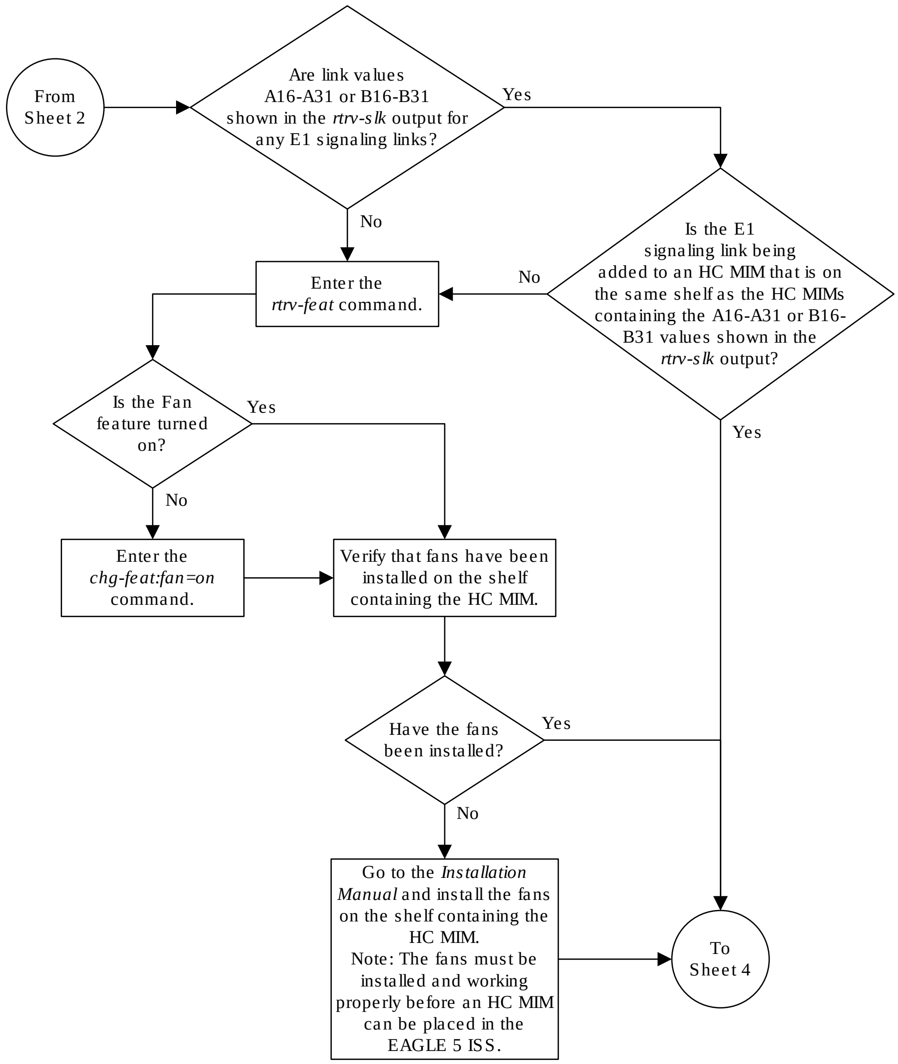
Figure A-14 Adding an E1 Signaling Link



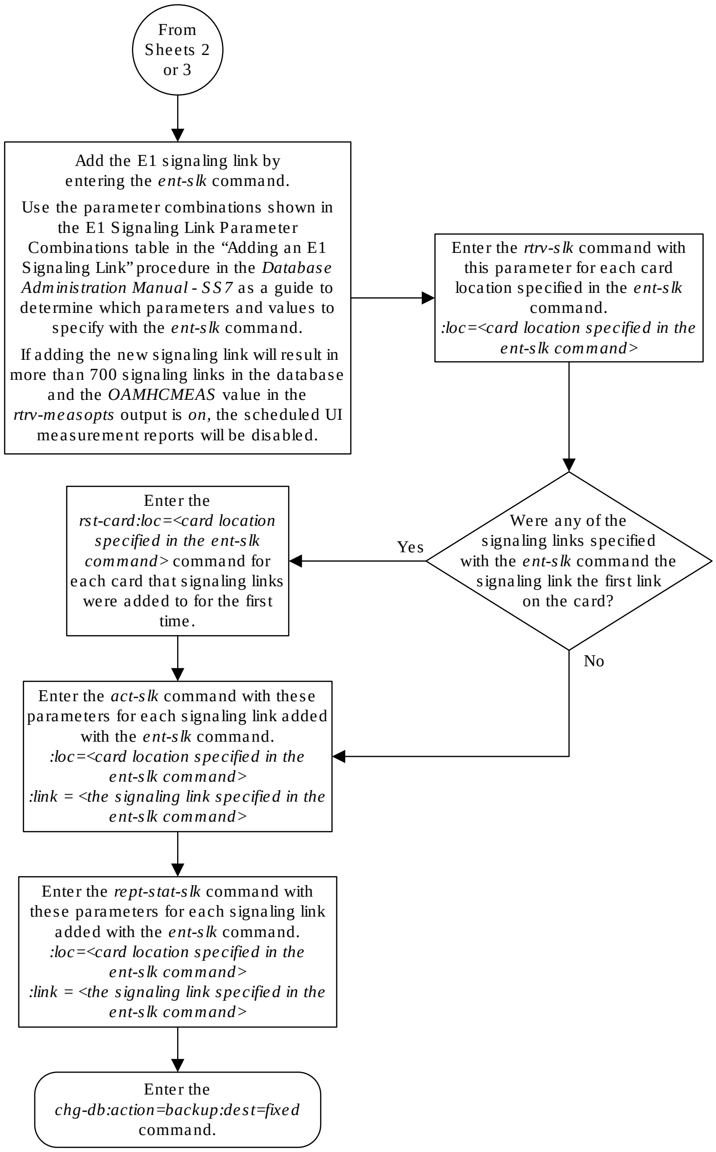
Sheet 1 of 4


From Sheet 1
Which card type is the E1 signaling link being assigned to?
LIMCH
To Sheet 4
LIME1
Enter the *rtrv-t1* command.
Is the desired E1 port and card location combination shown in the *rtrv-slk* output?
No
Perform one of these procedures in this chapter to add the desired E1 port.
"Adding Channelized and non-Channel Bridged E1 Ports"
"Adding Channel Bridged E1 Ports"
"Adding Unchannelized E1 Ports"
Yes
Verify the type of the E1 card.
Enter this command.
rtrv-stp:type=lime1
Note: The E1 card can be one of these types.
Card Type / Part Number
E1/T1 MIM 870-2198-XX
HC MIM 870-2671-XX
E5-E1T1 870-1873-XX
Which type of card is the E1 signaling link being assigned to?
HC MIM or E5-E1T1 Card
Note: Link values A16-A31 or B16-B31 can be specified only for E1 signaling links that are assigned to HC MIMs.
E1/T1 MIM
What value for the *linkclass* parameter is assigned to the E1 port?
CHAN
UNCHAN
Are link values A16-A31 or B16-B31 being specified for the E1 signaling link? See the Note.
No
To Sheet 4
Yes
To Sheet 3

Sheet 2 of 4


From Sheet 2
Are link values A16-A31 or B16-B31 shown in the rtrv-slk output for any E1 signaling links?
Yes
No
Enter the rtrv-feat command.
No
Is the E1 signaling link being added to an HC MIM that is on the same shelf as the HC MIMs containing the A16-A31 or B16-B31 values shown in the rtrv-slk output?
Is the Fan feature turned on?
Yes
Yes
No
Enter the chg-feat:fan=on command.
Verify that fans have been installed on the shelf containing the HC MIM.
Have the fans been installed?
Yes
No
Go to the Installation Manual and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 4

Sheet 3 of 4


From Sheets 2 or 3
Add the E1 signaling link by entering the ent-slk command.
Use the parameter combinations shown in the E1 Signaling Link Parameter Combinations table in the "Adding an E1 Signaling Link" procedure in the Database Administration Manual - SS7 as a guide to determine which parameters and values to specify with the ent-slk command.
If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the rtrv-measopts output is on, the scheduled UI measurement reports will be disabled.
Enter the rtrv-slk command with this parameter for each card location specified in the ent-slk command.
:loc=<card location specified in the ent-slk command>
Were any of the signaling links specified with the ent-slk command the signaling link the first link on the card?
Yes
No
Enter the rst-card:loc=<card location specified in the ent-slk command> command for each card that signaling links were added to for the first time.
Enter the act-slk command with these parameters for each signaling link added with the ent-slk command.
:loc=<card location specified in the ent-slk command>
:link = <the signaling link specified in the ent-slk command>
Enter the rept-stat-slk command with these parameters for each signaling link added with the ent-slk command.
:loc=<card location specified in the ent-slk command>
:link = <the signaling link specified in the ent-slk command>
Enter the chg-db:action=backup:dest=fixed command.

Sheet 4 of 4

B

T1 Interface

Appendix B, T1 Interface, contains general information about the T1 interface and how to provision it.

B.1 Introduction

The **T1** interface terminates or distributes **T1** facility signals for the purpose of processing the **SS7** signaling links carried by the **T1** carrier. The **T1** interface can be either an **E1**/**T1 MIM** or an **HC**-**MIM**, or an **E5-E1T1** card as shown in Figure B-1 and Figure B-2. The **E1**/**T1 MIM**, **HC**-**MIM**, or **E5-E1T1** card can also be used as an **E1** interface. This appendix describes how the **T1** interface is configured. The **E1** interface configuration is described in E1 Interface The **E1**/**T1 MIM** contain up to eight signaling links and allows the **EAGLE** to contain more than 500 signaling links.

Figure B-1 E1/T1 MIM Block Diagram

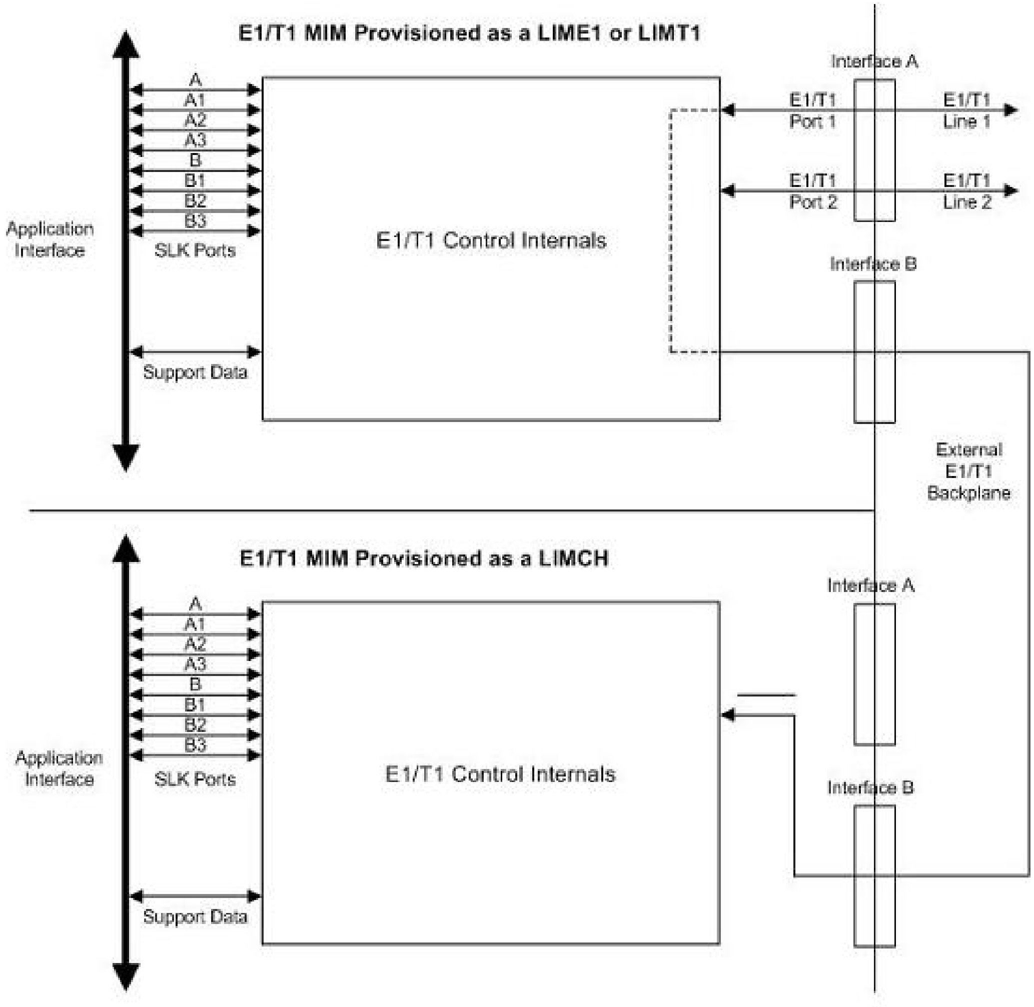


Figure B-2 HC MIM or E5-E1T1 Block Diagram

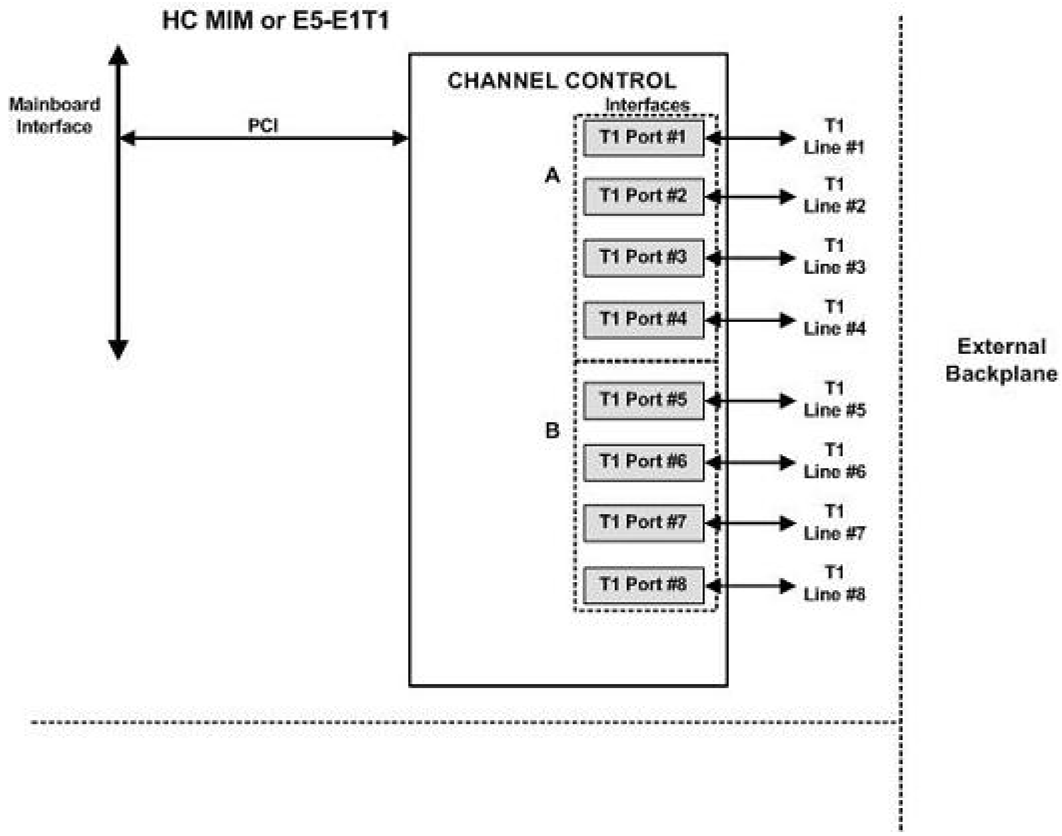


Table B-1 provides an overview of the functions of the **T1** card and the channel card.

Table B-1 Functional Overview of the T1 and Channel Card

Card	Function
T1	• Connectivity of both **T1** interfaces to a 100 Ohm interface. • Processing of a total of eight time slots from the **T1** interfaces • Interface **T1** port 1 through an external backplane to channel cards for processing of additional time slots
Channel	• Processing of eight time slots from the **T1** interface • Interface through an external backplane to a **T1** card to process eight time slots

Configured as a T1 Card

Configured as a **T1** card, two separate and independent **T1** inputs can be terminated on a **T1**/channel card. From one or two bi-directional **T1** facility inputs, one to eight bi-directional channels are extracted and processed as **SS7** signaling links. Implemented as **T1 Link** Interface Modules, up to 24 separate and independent **T1** inputs can be terminated in an extension shelf. The transmission rate of signaling links on the **MIM** card must be 56 kbps.

Configured as a Channel Card

In an extension shelf equipped with the **T1** backplane, a **T1** configured card terminates one or two **T1** inputs and connects the **T1** port 1 input to one of eight available busses on the **T1** cabling backplane. Other **T1** cards configured as channel cards also connected to the **T1** cabling backplane are able to extract any eight signaling channels from the same **T1** port 1 input. The transmission rate of signaling links on the **MIM** card configured as a channel card must be 56 kbps.

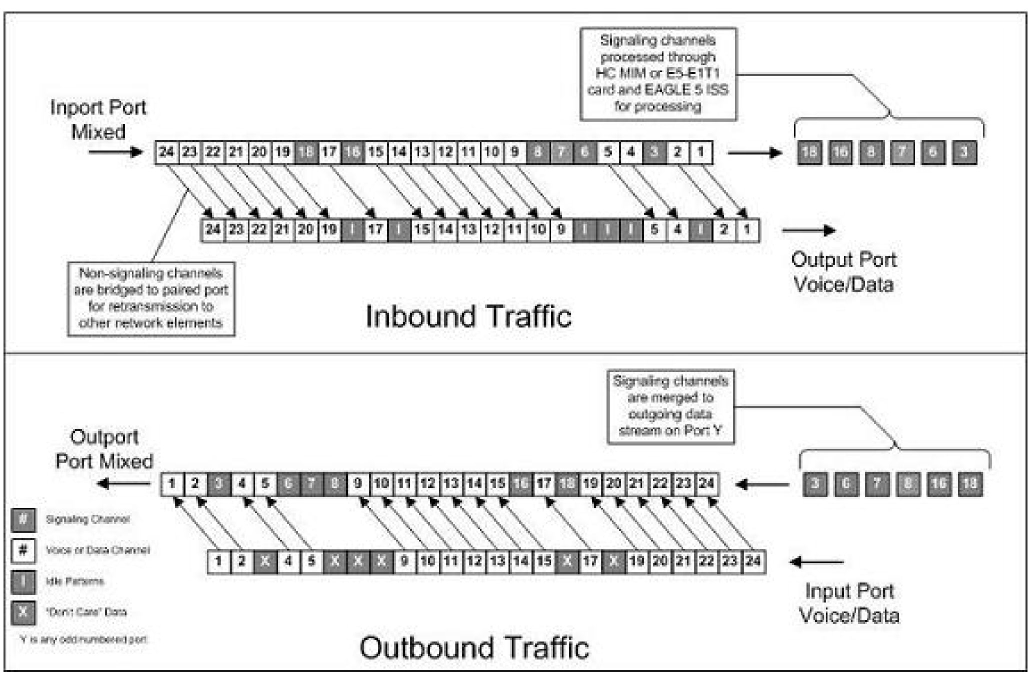
> **Note:**
>
> An **HCMIM** or an **E5-E1T1** card cannot be used as a channel card.

High Capacity Multi-Channel Interface Module (HC-MIM) and Eagle 5 - E1 T1 Interface (E5-E1T1)

The **High Capacity Multi-Channel Interface Module** (**HC-MIM**) and EAGLE 5 - **E1 T1** Interface (**E5-E1T1**) provides access to eight **T1** ports residing on backplane connectors A and B. Each data stream consists of 24 **T1 DS0** signaling links assigned in a time-division multiplex manner. Each channel occupies a unique timeslot in the data stream and can be selected as a local signaling link on the interface card. A maximum of 64 **T1** signaling links can be assigned to an **HC-MIM**. A maximum of 32 **T1** signaling links can be assigned to an **E5-E1T1** card.

To support the processing of signaling channels that are intermixed on trunks with voice or data channels, the **HC-MIM** and **E5-E1T1** card allows **T1** ports to be channel bridged. This allows better utilization of **T1** bandwidth without dedicating entire trunks to signaling.

Figure B-3   Channel Bridging



Channel bridging is implemented by pairing odd and even **T1** ports. The **T1** port selected for channel bridging is the odd numbered port (1, 3, 5, 7). When the **T1** port is selected for channel bridging, it is paired with its adjacent even numbered port (2, 4, 6, 8) as shown in Table B-2.

Table B-2 Channel Bridging T1 Port Pairing

Odd Numbered T1 Port (Bridging Master)	Even Numbered T1 Port Bridged to the Odd Numbered T1 Port (Bridging Slave)
1	2
3	4
5	6
7	8

By pairing **T1** ports, the adjacent even numbered **T1** port could be used to allow data received on the bridging master (odd) **T1** port to reach downstream network elements. This interface is a bi-directional interface so data is also able to enter the bridging slave (even) **T1** port and leave the **EAGLE** through the bridging master (odd) **T1** port. There is a 1 to 1 correspondence between the timeslots on the bridging master and slave **T1** ports.

In order to use channel bridging without facility errors, both **T1** ports (bridging master and slave) must be synchronous (timed off the same clock source). This may be accomplished in one of the following ways:

- The bridging master **T1** port and the bridging slave **T1** port use timing recovered from each other (using the `t1tsel=recovered` parameter with either the `ent-t1` or `chg-t1` command). When provisioning channel bridged **T1** port, only the bridging master **T1** port is provisioned with the `ent-t1` or `chg-t1` command. The bridging slave **T1** port is automatically provisioned with the same attributes as the bridging master **T1** port.
- Both the bridging master and slave **T1** ports are using an external clock source (using the `t1tsel=external` parameter when provisioning the channel bridged **T1** port with either the `ent-t1` or `chg-t1` command).

Any other methods used for timing could cause problems on the **T1** trunk and are not be supported.

Idle patterns on the shadow channels, that is, the timeslots located on the bridging slave **T1** port that have been not been dropped from the bridging master **T1** port, are provided by the **EAGLE**. All other idle timeslots that are not dropped by the **EAGLE** must contain an idle pattern provided by the remote network elements connected to both **T1** ports (bridging master and slave). Without these patterns on the idle timeslots, instability of the **T1** signaling link may occur.

Provisioning of signaling links on the bridging slave **T1** port is not allowed while the bridging master **T1** port is channel bridged.

B.2 Determining the Configuration

External Interface Descriptions

The **T1** backplane provides a method for extending individual **T1** channels from the **T1**-configured cards to any channel-configured cards in use. Note the following issues regarding the **T1** backplane:

- Only one **T1**-configured card may be plugged into each bus on the backplane.
- When installing non-**T1** cards on the shelf equipped with the **T1** interface backplane, ensure that none of the slots to be used are cabled to the **T1** interface backplane. If a non-**T1** card is installed in a slot that is connected to the **T1** backplane, all **T1** cards on that bus may fail.
- Only one **T1** card may be connected (via the B port) to each bus of the **T1** backplane, and all **SS7** links derived from any particular **T1** must be processed on the same shelf on which the incoming **T1** is terminated.
- Due to cable congestion, Oracle does not recommend use of the **T1** cabling backplane on the control shelf.
- If the control shelf is used, a maximum of 20 **T1** interfaces can be utilized in the control shelf.

Descriptions of the **T1** hardware and the procedures for installing the **T1** hardware are contained in *Hardware Reference* and *Installation Guide*.

The procedure for removing a **T1** signaling link is the same as removing an **SS7** signaling link, so to remove a **T1** signaling link from the database, go to the Removing an SS7 Signaling Link procedure.

Possible Configurations

The **T1** backplane was designed to allow the maximum number of possible customer setups. It allows the customer to choose between several levels of diversity and convenience. Configurations depend on the number of cards configured as **T1** cards versus the number of cards configured as channel cards. The level of diversity required by the customer also affects the configuration requirements. Note that all signals labeled “**T1** input” may be one or two **T1** ports depending on the cable used.

Support of Two T1 Ports

The **E1**/**T1 MIM** will support two **T1** ports, which are independently configurable. On a **T1** card, **T1** port 1 will support channel cards. The second port of that **T1** card will only support up to a maximum of eight time slots and will not support channel cards.

Clocking Options

Each **T1** interface must independently operate in one of two clocking modes. When configured as a channel card, a **T1** card is required for the channel card’s clocking source.

- Slave Timing - The default receive clock on the **LIM-T1** card will be used as the source of the transmit clock.
- Master Timing - The transmit clock of the **LIM-T1** card. The Master Timing feature allows a **T1** signaling link to take its high-speed clock reference directly from an external high-speed master clock source.

Support of T1 Framing Options

The **T1** interfaces independently support either the **SF** (superframe format) or **ESF** (extended superframe format) **T1** framing options. Selection of these options is made by the `framing` parameter of either the `ent-t1` or `chg-t1` commands.

LIM-T1 Card to Channel Card Interface

Whether the **T1** card is operating as a **T1** card or a channel card, the card will map any eight channels from the **T1** interfaces to an **HDLC** controller (ports A, B, A1, A2, A3, B1, B2, B3). These eight channels could be dropped either both from **T1** port 1 or one from **T1** port 1 and the other from **T1** port 2. When the **T1** card is configured as a **T1** card, it will support the external **T1** cabling backplane interface from **T1** port 1 *(***T1** *port 2 will not have this capability)* to additional **T1** cards, within the same shelf, configured as channel cards. Idle time slots not assigned to a **T1** card or a channel card will be filled with a one's pattern.

T1 Configuration Form

Use the form provided below to record your **T1** configuration. An example of the required input is shown in italics under each column heading.

Table B-3 T1 Signaling Link Configuration Form

Card Location and Port (*1201 A*)	Timeslot (*1*)	T1 Number (*1*)	T1 Card Location (*1201*)	Adjacent Point Code (*4001*)	Linkset (ST1ME)	SLC (*1*)

B.3 T1 Interface Configuration Procedures

This appendix contains these procedures because they contain information specific to the **T1** Interface:

- Adding a LIM-T1 Card
- Removing a LIM-T1 Card
- Adding Channelized and non-Channel Bridged T1 Ports
- Adding Channel Bridged T1 Ports
- Adding Unchannelized T1 Ports
- Removing the T1 Interface Parameters
- Changing the Attributes of a Channelized T1 Port
- Changing the Attributes of an Unchannelized E1 Port
- Making a Channel Bridged T1 Port from a Channelized T1 Port
- Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port
- Adding a T1 Signaling Link

Procedures for configuring the linksets and routes, for removing **SS7** signaling links (which includes **T1** signaling links), and for configuring the **HC MIM** temperature alarms are contained in SS7 Configuration These procedures contain no information that is specific to the **T1** interface, therefore, are not included in this appendix.

The procedures contained in this appendix use a variety of commands. If more information on these commands is needed, go to the *Commands Manual* to find the required information.

B.4 Adding a LIM-T1 Card

The **LIM-T1** card is provisioned as either a **T1** card or a channel card in the database using the `ent-card` command. The card being provisioned in the database can be one of these cards shown in Table B-4.

Table B-4 T1 Card Part Numbers

Card Type	Part Number
E1/T1MIM	870-2198-**XX**
E5-E1T1	870-1873-**XX**

The `ent-card` command uses these parameters.

`:loc` – The location of the card being added to the database.

> **Note:**
>
> The **HC-MIM** can be inserted in an odd-numbered card location only. The **HC-MIM** will not power up if it is inserted in an even-numbered card location. All **T1** backplane cabling should be removed from the B connector for the slot that the **HC-MIM** will occupy.
> The **HC-MIM** occupies two card locations, so the even numbered card location adjacent to the odd numbered slot where the **HC-MIM** has been inserted must be empty, as shown in Table B-5. The **HC-MIM** is connected to the network through the odd numbered card slot connector.

Table B-5 HC-MIM Card Locations

Location of the HC-MIM	Empty Card Location	Location of the HC-MIM	Empty Card Location
Slot 01	Slot 02	Slot 11	Slot 12
Slot 03	Slot 04	Slot 13	Slot 14
Slot 05	Slot 06	Slot 15	Slot 16
Slot 07	Slot 08	Slot 17	Slot 18

The **E1/T1 MIM** and **E5-E1T1** card occupies one card location. These cards can be placed in any card location except for even numbered card locations whose adjacent odd numbered card location is occupied by a card that occupies two card locations.

`:type` – The type of card being added to the database. For this procedure, the value of this parameter is `limt1` (**T1** card) or `limch` (channel card).

> **Note:**
>
> The **E5-E1T1** card cannot be provisioned as a channel card.

`:appl` – The application software that is assigned to the card. For this procedure, the value of this parameter is either `ccs7itu` or `ss7ansi`.

`:force` – Allow the **LIM** to be added to the database even if there are not enough service modules in the **EAGLE** to support the number of **LIMs** in the **EAGLE**. This parameter is obsolete and is no longer used.

The shelf to which the card is to be added must already be in the database. This can be verified with the `rtrv-shlf` command. If the shelf is not in the database, see the Adding a Shelf procedure in *Database Administration - System Management User's Guide*.

The examples in this procedure are used to add the **LIM-T1** cards in card locations 1215 and 1216 to the database.

1. Display the cards in the **EAGLE** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
```

```
1102   TSM        GLS
1113   GSPM       OAM
1114   TDM-A
1115   GSPM       OAM
1116   TDM-B
1117   MDAL
1201   LIMDS0     SS7ANSI  lsne12      A    0
1202   LIMDS0     SS7ANSI  lsne12      A    1
1203   LIMDS0     SS7ANSI  lsne13      A    0
1204   LIMDS0     SS7ANSI  lsne13      A    1
1207   LIMT1      SS7ANSI  lsnt265     A    0
1208   LIMCH      SS7ANSI  lsnt265     A    1   lsnt265     A2   2
1211   LIMT1      CCS7ITU  lsne145     A    0
1212   LIMCH      CCS7ITU  lsne145     A    1   lsne145     A2   2
```

The cards should be distributed throughout the **EAGLE** for proper power distribution. Refer to *Installation Guide* for the shelf power distribution.

2. Verify that the correct hardware has been installed on the **EAGLE** to support the **LIM-T1** card as shown in *Installation User's Guide*.
3. Physically verify that the T1 card has been installed into the card location that will be specified in 7.

   If the T1 card is an HC-MIM, make sure the HC-MIM is installed according to the card location requirements shown in Table B-5. If a card is installed and provisioned in the even-numbered card location adjacent to the desired odd numbered card, choose another card location to install and provision the HC-MIM, or remove the card in the even-numbered card location by performing the appropriate procedure shown in Table B-6.

> **Note:**
>
> Channel cards must be installed in the same shelf as the T1 card that is servicing the timeslots on those channel cards.

Table B-6 Card Removal Procedures

Card Application	Procedure
SS7ANSI, **ATMANSI**, **CCS7ITU**, **ATMITU**	"Removing an **SS7 LIM**" in Chapter 4, "System Configuration Procedures" in *Database Administration - System Management User's Guide* "Removing a **LIM-E1Card**" "Removing a **LIM-T1Card**"
VSCCP	Removing a Service Module in Chapter 2 in *Database Administration - GTT User's Guide*
GLS	Removing a GLS Card in Chapter 2, Gateway Screening (GWS) Overview, in *Database Administration - GWS User's Guide*

Table B-6 (Cont.) Card Removal Procedures

Card Application	Procedure
IPLIM, **IPLIMI**, **SS7IPGW**, **IPGWI**	"Removing an IPLIMx Card" or Removing an IPGWx Card" in *Database Administration - IP7 User's Guide*
IPSG	"Removing an IPSG Card" in *Database Administration - IP7 User's Guide*
EROUTE	“Removing an **STC** Card” in *Database Administration - Features User's Guide*
MCP	“Removing an **MCPM**” in Chapter 4, “System Configuration Procedures” in *Database Administration - System Management User's Guide*
IPS	“Removing an **IPSM**” in Chapter 4, “System Configuration Procedures” in *Database Administration - System Management User's Guide*

4. If the card is an EPM-B based card (E5-E1T1-B), enter the `rtrv-stpopts` command to verify whether or not the MFC option is on. If the card is not an EPM-B based card, continue the procedure with 5

   This is an example of the possible output.

   ```
   rlghncxa03w 11-10-17 16:02:05 GMT EAGLE5 44.0.0
   STP OPTIONS
   ---------------------------
   MFC                        off
   ```

   The `rtrv-stpopts` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in *Commands User's Guide*.

   If the **MFC** option is off, perform the Configuring the MFC Option procedure in *Database Administration - System Management User's Guide* to turn on the MFC option.

   If the MFC option is on or the MFC Option procedure in *Database Administration - System Management User's Guide* was performed in this step, continue the procedure with 5.

5. The Fan feature must be turned on. Enter the `rtrv-feat` command to verify that the Fan feature is on.

   If the Fan feature is on, shown in the `rtrv-feat` output in this step, the `FAN` field should be set to `on`.

   The `rtrv-feat` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 7.

   If the Fan feature is off, continue the procedure with 6.

6. Turn the Fan feature on by entering this command.

   `chg-feat:fan=on`

   > **Note:**
   >
   > Once the Fan feature is turned on with the`chg-feat` command, it cannot be turned off.

   When the `chg-feat` has successfully completed, this message appears.

   ```
   rlghncxa03w 11-10-28 11:43:04 GMT EAGLE5 44.0.0
   CHG-FEAT: MASP A - COMPLTD
   ```

7. Add the card using the `ent-card` command. If the **LIM-T1** card is an **HC-MIM**, the **HC-MIM** can be only in a odd-numbered card location, and cannot be provisioned as a channel card.

   For this example, enter these commands.

   `ent-card:loc=1215:type=limt1:appl=ss7ansi`

   `ent-card:loc=1216:type=limch:appl=ss7ansi`

8. Verify the changes using the `rtrv-card` command with the card location specified in 7 .

   For this example, enter these commands.

   `rtrv-card:loc=1215`

   ```
   rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
   CARD   TYPE      APPL     LSET NAME    LINK SLC LSET NAME    LINK SLC
   1215   LIMT1     SS7ANSI
   ```

   `rtrv-card:loc=1216`

   ```
   rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
   CARD   TYPE      APPL     LSET NAME    LINK SLC LSET NAME    LINK SLC
   1216   LIMCH     SS7ANSI
   ```

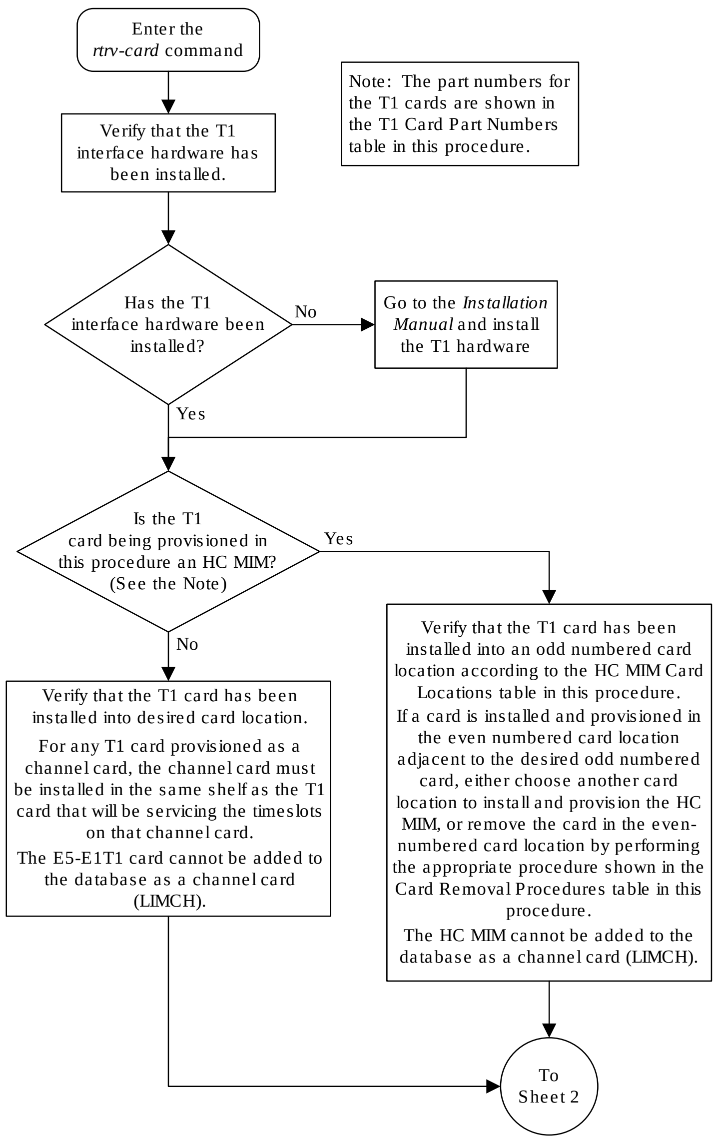
9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

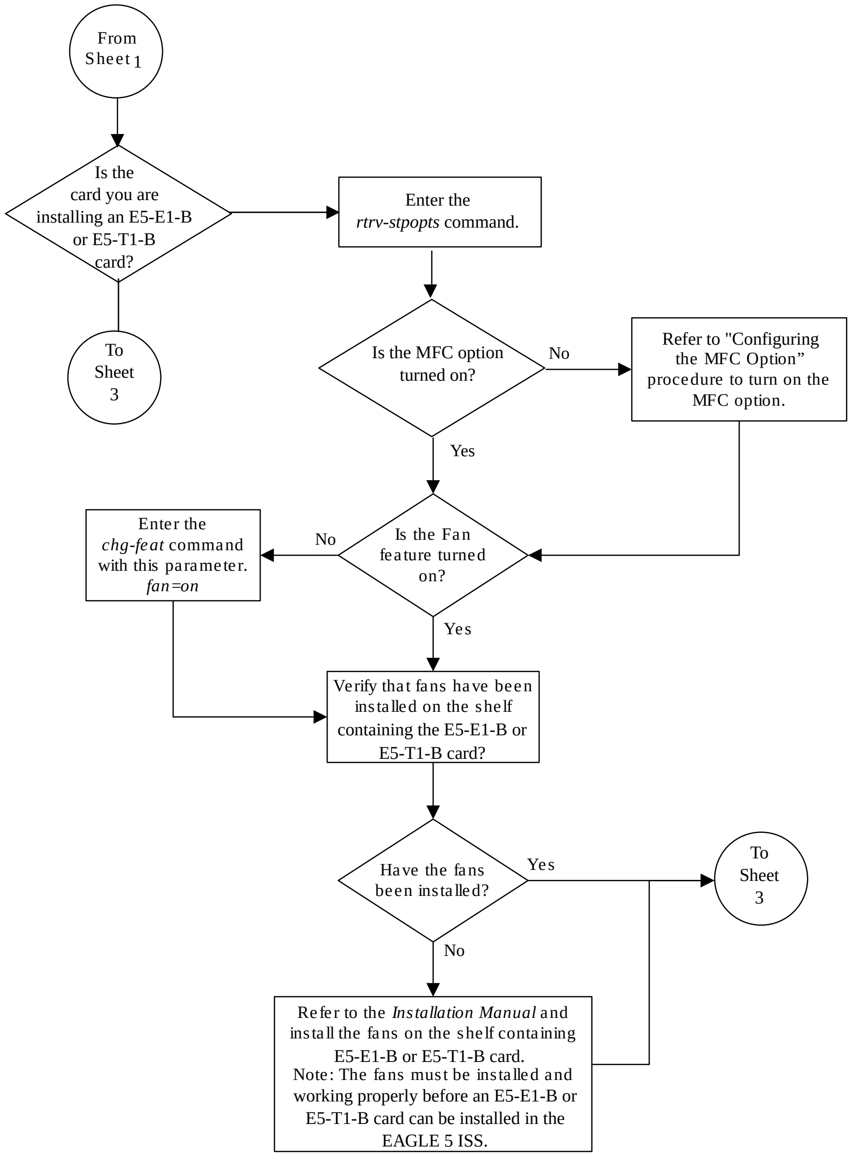
   ```
   BACKUP (FIXED) : MASP A - Backup starts on active MASP.
   BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
   complete.
   BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
   ```

```
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

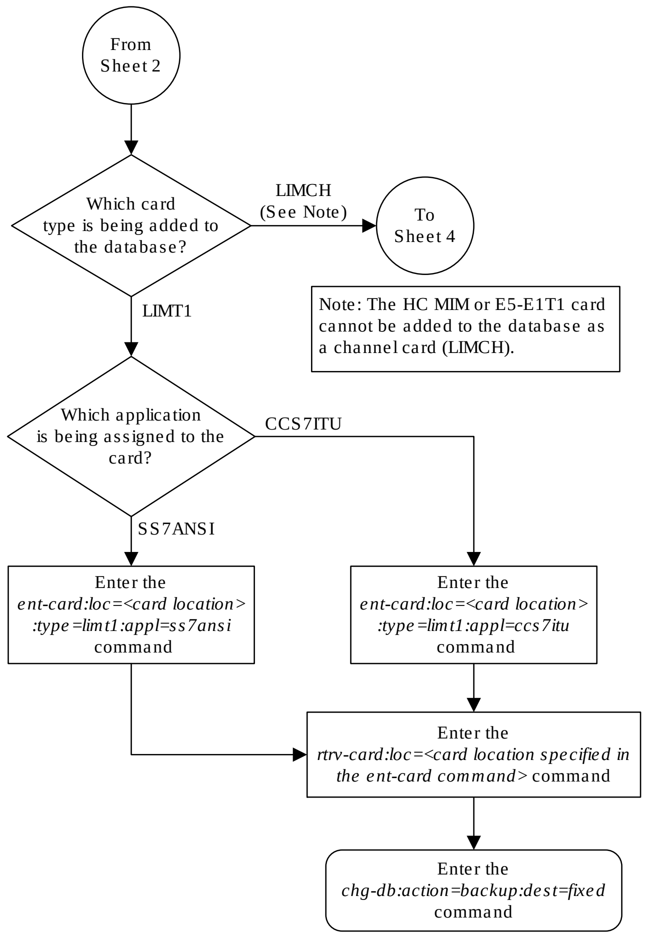
Figure B-4 Adding a LIM-T1 Card



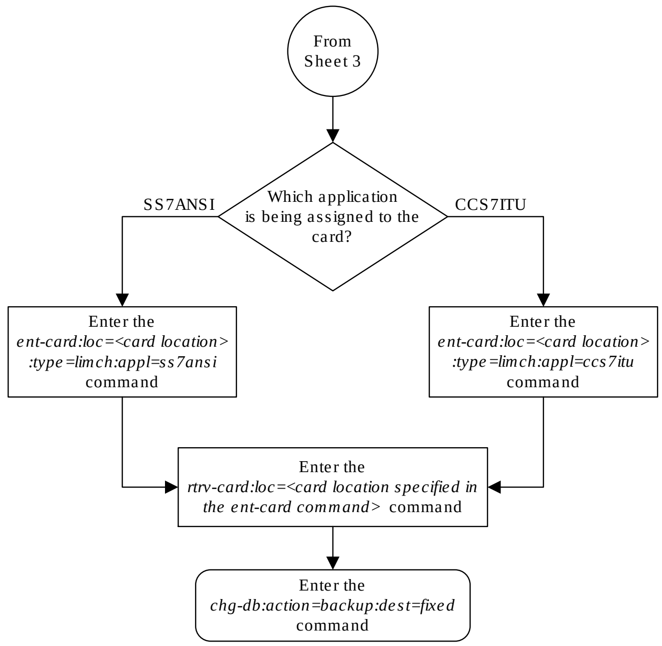
Sheet 1 of 4


From Sheet 1
Is the card you are installing an E5-E1-B or E5-T1-B card?
To Sheet 3
Enter the *rtrv-stpopts* command.
Is the MFC option turned on?
No
Refer to "Configuring the MFC Option" procedure to turn on the MFC option.
Yes
Is the Fan feature turned on?
No
Enter the *chg-feat* command with this parameter. *fan=on*
Yes
Verify that fans have been installed on the shelf containing the E5-E1-B or E5-T1-B card?
Have the fans been installed?
Yes
To Sheet 3
No
Refer to the *Installation Manual* and install the fans on the shelf containing E5-E1-B or E5-T1-B card. Note: The fans must be installed and working properly before an E5-E1-B or E5-T1-B card can be installed in the EAGLE 5 ISS.

Sheet 2 of 4


From Sheet 2
Which card type is being added to the database?
LIMCH (See Note)
To Sheet 4
Note: The HC MIM or E5-E1T1 card cannot be added to the database as a channel card (LIMCH).
LIMT1
Which application is being assigned to the card?
CCS7ITU
SS7ANSI
Enter the *ent-card:loc=<card location> :type=limt1:appl=ss7ansi* command
Enter the *ent-card:loc=<card location> :type=limt1:appl=ccs7itu* command
Enter the *rtrv-card:loc=<card location specified in the ent-card command>* command
Enter the *chg-db:action=backup:dest=fixed* command

Sheet 3 of 4



Sheet 4 of 4

B.5 Removing a LIM-T1 Card

This procedure is used to remove either a **T1** card or a channel card from the database using the `dlt-card` command. The card being removed must exist in the database.

If a **T1** card is being removed, then no **T1** interfaces can be assigned to the card. This can be verified with the `rtrv-t1` command. Go to the Removing the T1 Interface Parameters procedure to remove the **T1** interfaces assigned to the **T1** card being removed from the database.

If only a channel card is being removed from the database, then no **SS7** signaling links can be assigned to the card. This can be verified with the `rtrv-slk` command. Go to the Removing an SS7 Signaling Link procedure to remove the signaling links assigned to the channel card being removed from the database.

> **Caution:**
>
> If the **T1** card or channel card is the last **SS7LIM** in service, removing this card from the database will cause **SS7** traffic to be lost and isolate the **EAGLE** 5 **ISS** from the network.

The examples in this procedure are used to remove the **T1** cards in card locations 1207 and 1208.

1. Display the cards in the database using the `rtrv-card` command. This is an example of the possible output.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1207   LIMT1     SS7ANSI  lsnt265       A   0
1208   LIMCH     SS7ANSI  lsnt265       A   1   lsnt265     A2   2
1211   LIME1     CCS7ITU  lsne145       A   0
1212   LIMCH     CCS7ITU  lsne145       A   1   lsne145     A2   2
1215   LIMT1     SS7ANSI  lsnt145       A   0
1216   LIMCH     SS7ANSI  lsnt145       A   1   lsnt145     A2   2
```

> **Note:**
>
> If a **T1** card is being removed from the database, skip step 2 and go to step 3.

2. Display the signaling links on the channel card you wish to remove by entering the `rtrv-slk` command, specifying the card location shown in the `rtrv-card` command output. For this example, enter this command.

`rtrv-slk:loc=1208`

```
rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0
                                     L2T                PCR  PCR    T1   T1
LOC  LINK LSN          SLC TYPE      SET  BPS    ECM    N1   N2     LOC  PORT
TS
1208 A    lsnt265       1  LIMCH     1    56000  BASIC ---   ----- 1207 1
6
```

```
1208 A2    lsnt265      2  LIMCH    1    56000  BASIC ---  -----
1207 1     17
```

Go to the Removing an SS7 Signaling Link procedure to remove the signaling links assigned to the channel card.

> **Note:**
>
> If only a channel card is being removed from the database, skip step 3 and go to step 4.

3. Display the **T1** interfaces assigned to the **T1** card being removed from the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                 LINK    MINSU
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1207  1     AMI     EXTERNAL  ESF      50   -----     CHAN    ----
1215  2     B8ZS    LINE      SF       100  -----     CHAN    ----
```

Go to the Removing the T1 Interface Parameters procedure to remove the **T1** interfaces assigned to the **T1** card.

4. Remove the card using the `dlt-card` command. The `dlt-card` command has only one parameter, `loc`, which is the location of the card. For this example, enter these commands.

   `dlt-card:loc=1207`

   `dlt-card:loc=1208`

5. Verify the changes using the `rtrv-card` command specifying the card that was removed in step 4. For this example, enter these commands.

   `rtrv-card:loc=1207`

   `rtrv-card:loc=1208`

   When these commands have successfully completed, this message should appear.

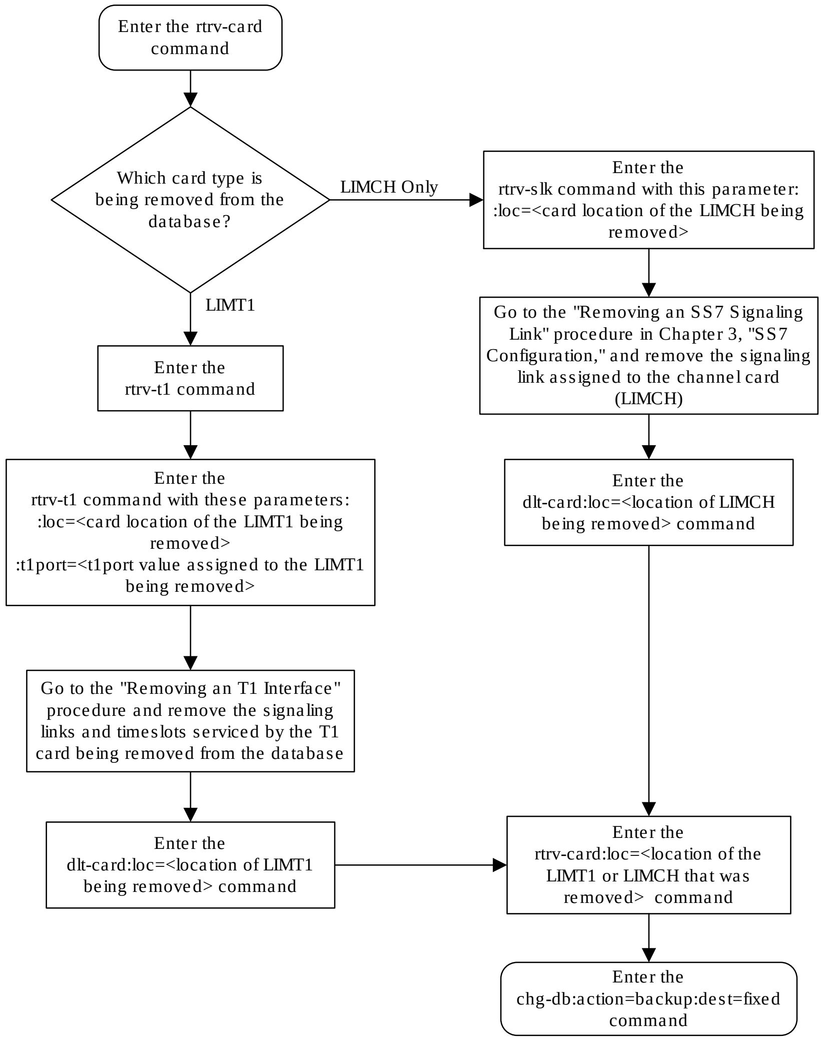
```
E2144 Cmd Rej: Location invalid for hardware configuration
```

6. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
```

```
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure B-5 Removing a LIM-T1 Card



B.6 Adding Channelized and non-Channel Bridged T1 Ports

The channelized and non-channel bridged **T1** ports are provisioned in the database using the `ent-t1` command using these parameters.

`:loc` – The location of the T1 card (card type `limt1`) that is servicing the T1 signaling link. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:t1port` – The T1 port on the T1 card used to service the T1 signaling link. The `t1port` value cannot already be assigned to the T1 card specified by the `loc` parameter.

`:encode` – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**. The default value is **B8ZS** encoding (`encode=b8zs`).

`:t1tsel` – The timing source for the T1 signaling link, master (`external`), slave (`line`), or `recovered`. The default value is slave timing (`t1tsel=line`).

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and cannot be used in this procedure.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, **TDM**s 870-0774-15 or later must be installed in card locations 1114 and 1116, and the TDM Global Timing Interface options must be configured. For more information, refer to Configuring the Options for the TDM Global Timing Interface.

`:framing` – Specifies the framing format to be used on the TI signaling link, either `sf` or `esf`. The default value is `sf` (`framing=sf`).

`:ll` – The length of the cable, in feet, used for the T1 signaling link. The value of the `ll` parameter is from 0 to 655. The default value for this parameter is 133.

The `ent-t1` command contains other parameters that are not used in this procedure. These parameters and their usage are described in these sections:

- `t1tsel=recovered`, `chanbrdg`, and `force=yes` – Adding Channel Bridged T1 Ports.
- `framing=esfperf`, `linkclass`, and `minsurate` – Adding Unchannelized T1 Ports.

The **T1** card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

The **T1** card cannot contain channelized and unchannelized T1 ports.

1. Display the existing **T1** interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                      LINK    MINSU
LOC   PORT  ENCODE  T1TSEL     FRAMING  LL    CHANBRDG  CLASS   RATE
1207  1     AMI3    EXTERNAL   ESF      50    -----     CHAN    ----
```

   Continue the procedure by performing one of these substeps.

   a. If the **T1** card that the T1 port is being assigned to in this procedure is not shown in the `rtrv-t1` output, or if the T1 card has unchannelized T1 ports assigned to it, continue the procedure with 2 to verify if there are any T1 cards in the database that have no T1 ports assigned to them.
   b. If the `rtrv-t1` output shows that the T1 card has channel bridged T1 ports assigned to it, or that T1 ports 3, 4, 5, 6, 7, or 8 are assigned to the T1 card, the T1 card is an HC-MIM or an E5-E1T1 card. Continue the procedure with 7 to add the T1 port with the parameters allowed for an HC-MIM or an E5-E1T1 card.
   c. If the `rtrv-t1` output shows that the T1 card does not have channel bridged T1 ports assigned to it, or that T1 ports 3, 4, 5, 6, 7, or 8 are not assigned to the T1 card, verify the type of T1 card that the T1 port will be assigned to. The T1 card types and their part numbers are shown in Table B-4. If the T1 card is an HC-MIM or an E5-E1T1 card, continue the procedure by performing one of these steps.
      - If the T1 cards shown in this step are on the same shelf as the card that will contain the T1 port that is being added, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure with 7.
      - If the T1 cards shown in this step are not on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 3.
      - If the T1 cards shown in this step are on the same shelf as the card that will contain the T1 port that is being added, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 3.
   d. If the T1 card you wish to use in this procedure has all the T1 ports that are allowed to be assigned to it, select another T1 card to add the T1 port to, or continue the procedure with 2 to verify if there are any T1 cards in the database that have no T1 ports assigned to them. Table B-7 shows the number of T1 ports that are allowed for the different T1 card types.

Table B-7 Maximum Number of T1 Ports

T1 Card Types	Maximum Number of T1 Ports
HC-MIM	8
E5-E1T1	8

2. Display the cards in the **EAGLE** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME    LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1207   LIMT1     SS7ANSI  lsnt265     A    0
1208   LIMCH     SS7ANSI  lsnt265     A    1   lsnt265      A2   2
1211   LIME1     CCS7ITU  lsne145     A    0
1212   LIMCH     CCS7ITU  lsne145     A    1   lsne145      A2   2
1215   LIMT1     SS7ANSI
1216   LIMCH     SS7ANSI
```

Continue the procedure by performing one of these substeps.

a. If the desired T1 card is not shown in the `rtrv-card` output, perform Adding a LIM-T1 Card to add the desired T1 card. If you wish to assign T1 ports 3, 4, 5, 6, 7, or 8 to the T1 card, the T1 card being added must be an HC-MIM or an E5-T1T1 card.

b. If the desired T1 card is shown in the `rtrv-card` output, verify the type of T1 card that the T1 port will be assigned to. The T1 card types and their part numbers are shown in Table B-4.

c. If the T1 card that will be used in this procedure is an HC-MIM or an E5-E1T1 card, continue the procedure by performing one of these steps.

   - If T1 cards are shown in 1 that are on the same shelf as the card that will contain the T1 port that is being added, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure with 7 to add the T1 port with the parameters allowed for an HC-MIM or an E5-E1T1 card.

   - If no T1 cards, shown in 1, are not on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 3.

   - If T1 cards are shown in 1 that are on the same shelf as the card that will contain the T1 port that is being added, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 3.

3. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the T1 port being added in this procedure by entering this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL        CARD      RUNNING           APPROVED      TRIAL
HIPR2      1109      126-002-000       126-002-000   126-003-000
```

```
HIPR2      1110     126-002-000        126-002-000    126-003-000
HIPR2      1209     126-002-000        126-002-000    126-003-000
HIPR2      1210     126-002-000        126-002-000    126-003-000
HIPR2      1309     126-002-000        126-002-000    126-003-000
HIPR2      1310     126-002-000        126-002-000    126-003-000
HIPR2      2109     126-002-000        126-002-000    126-003-000
HIPR2      2110     126-002-000        126-002-000    126-003-000
Command Completed
```

If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 7.
- If the card is an HC MIM, continue the procedure with 4.

If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation User's Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure with 7.
- If the card is an HC MIM, continue the procedure with 4.

4. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

> **Note:**
>
> The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the Fan feature is on, continue the procedure with 7.

If the Fan feature is off, continue the procedure with 5.

5. Turn the Fan feature on by entering this command.

```
chg-feat:fan=on
```

> **Note:**
>
> Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
> The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

6. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

If the fans are installed, continue the procedure with 7.

If the fans are not installed on the shelf containing the HC-MIM, go to *Installation User's Guide* and install the fans. After the fans have been installed and tested, continue the procedure with 7.

7. Add the new T1 interface information to the database using the `ent-t1` command and the parameter combinations shown in Table B-8, based on the type of T1 card being used.

Table B-8 T1 Interface Parameter Combinations

HC-MIM or an E5-E1T1 Card without Channel Bridging
Mandatory Parameters
:loc=location of the T1 card
:t1port=1, 2, 3, 4, 5, 6, 7, 8
Optional Parameters
:encode=ami, b8zs Default value = b8zs
:framing=sf, esf Default value = sf
:ll=0 - 655 Default value = 133
:t1tsel=line, external Default value = line
Notes: 1. Channel cards cannot be specified with the `ent-t1` command. 2. To configure the T1 port for master timing, use the `t1tsel=external` parameter. 3. The `linkclass=chan` parameter configures a channelized T1 port. Specifying the `linkclass=chan` parameter in this procedure is unnecessary as this is the default value for the `linkclass` parameter.

For this example, enter these commands.

```
ent-
t1:loc=1215:t1port=2:encode=b8zs:t1tsel=line:framing=sf:ll=1
00
```

8. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 7. For this example, enter this command.

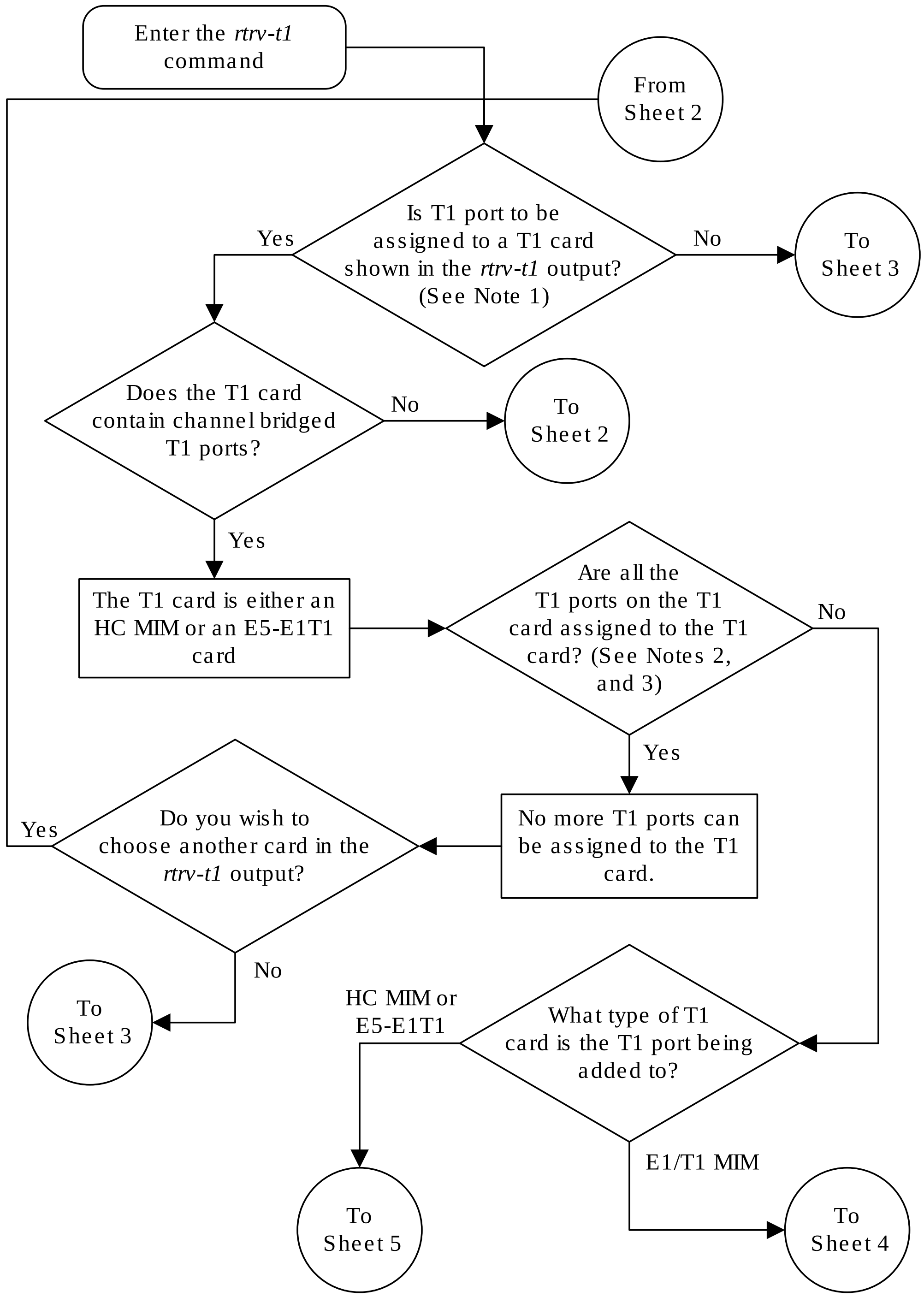
```
rtrv-t1:loc=1215:t1port=2


rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                 LINK     MINSU
LOC   PORT   ENCODE  T1TSEL   FRAMING  LL   CHANBRDG  CLASS    RATE
1215  2      B8ZS    LINE     SF       100  ------    CHAN     ----

TS1  ------    TS9   ------   TS17  ------
TS2  ------    TS10  ------   TS18  ------
TS3  ------    TS11  ------   TS19  ------
```

```
TS4  ------   TS12  ------   TS20  ------
TS5  ------   TS13  ------   TS21  ------
TS5  ------   TS14  ------   TS22  ------
TS7  ------   TS15  ------   TS23  ------
TS8  ------   TS16  ------   TS24  ------
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure B-6 Adding Channelized and non-Channel Bridged T1 Ports



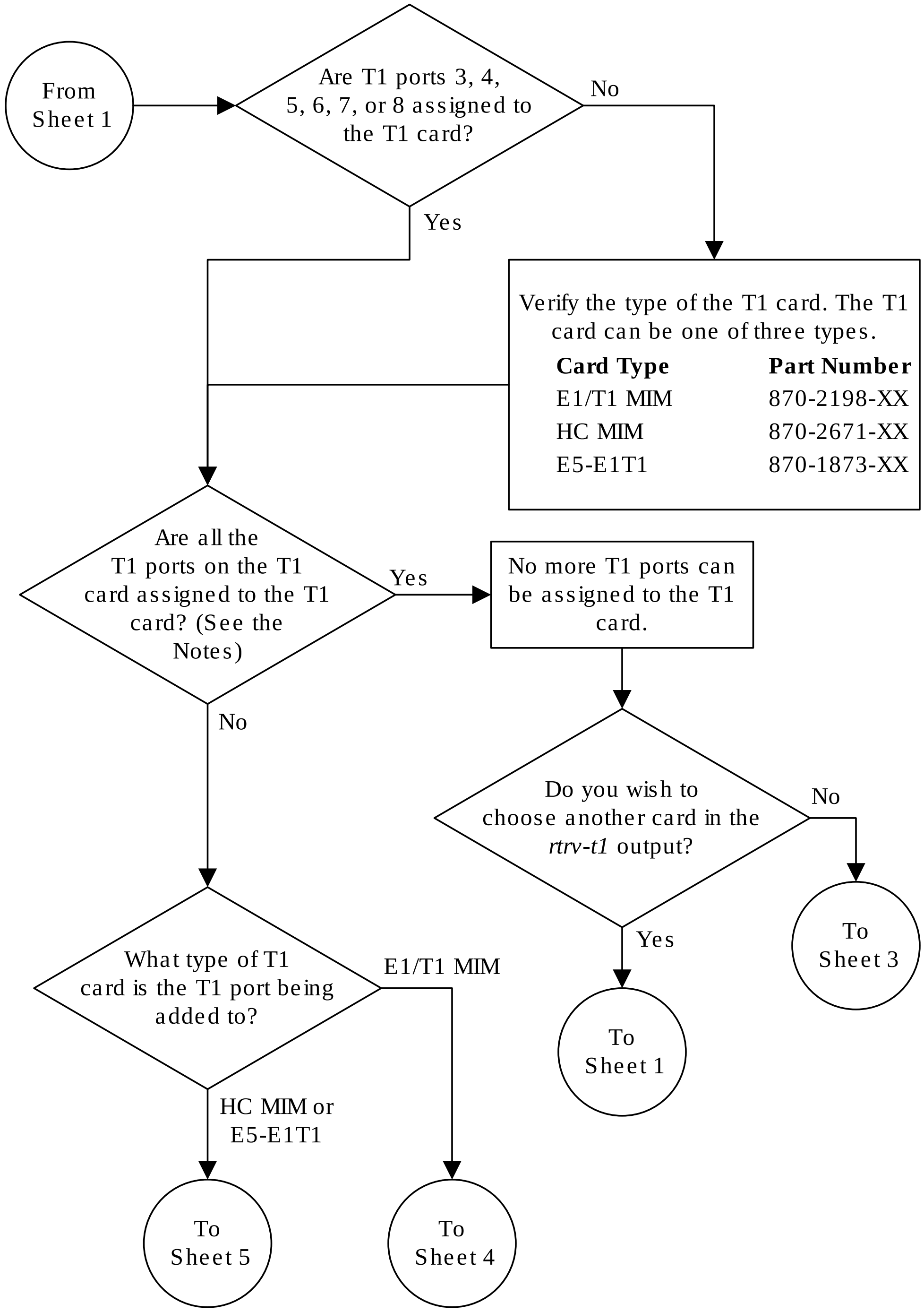
Notes:

1. T1 ports assigned in this procedure cannot be assigned to a T1 card containing unchannelized T1 ports.

2. The E1/T1 MIM can have only T1 ports 1 and 2 assigned to it.

3. The HC MIM or E5-E1T1 card can have T1 ports 1 through 8 assigned to it.

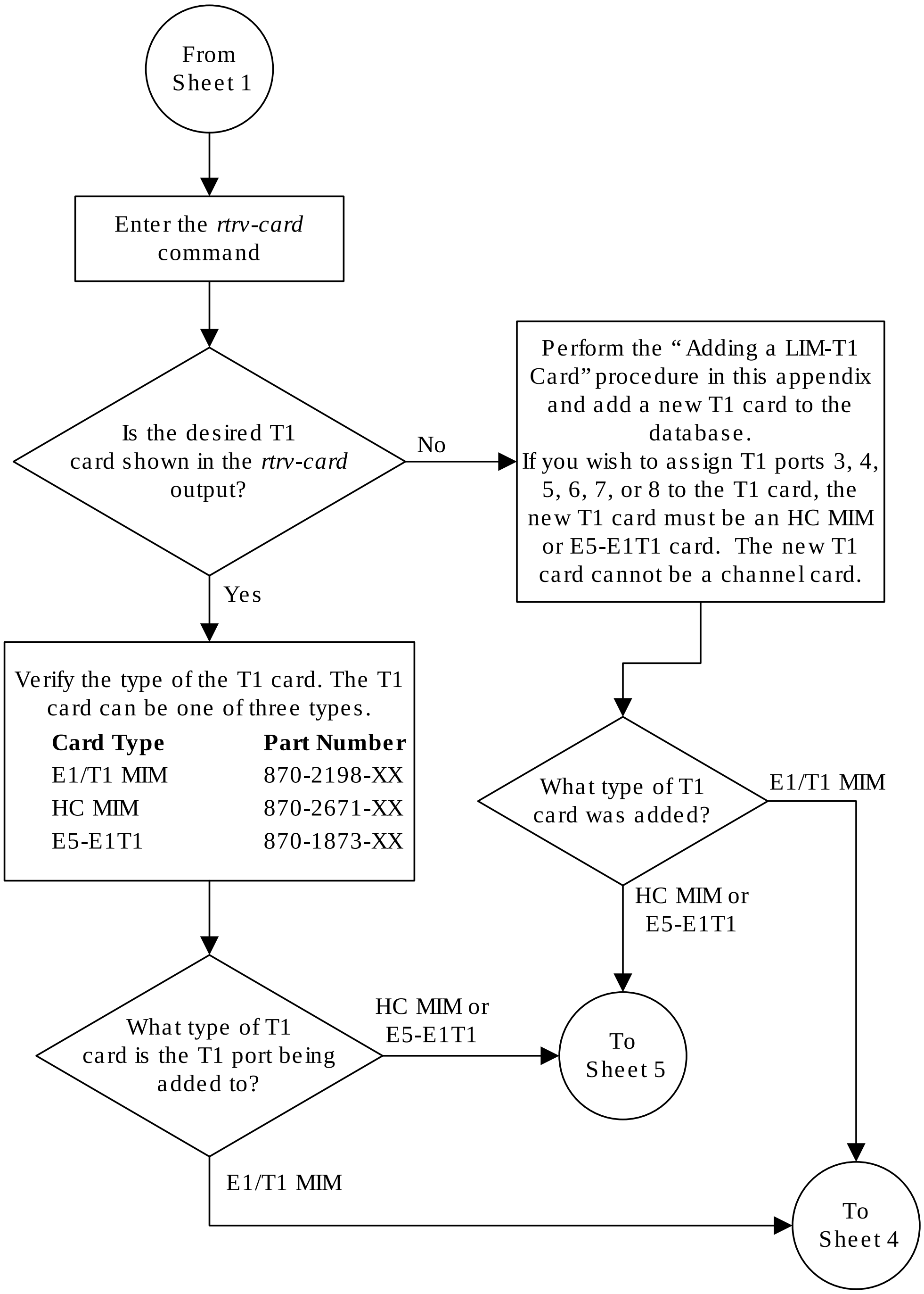
Sheet 1 of 7



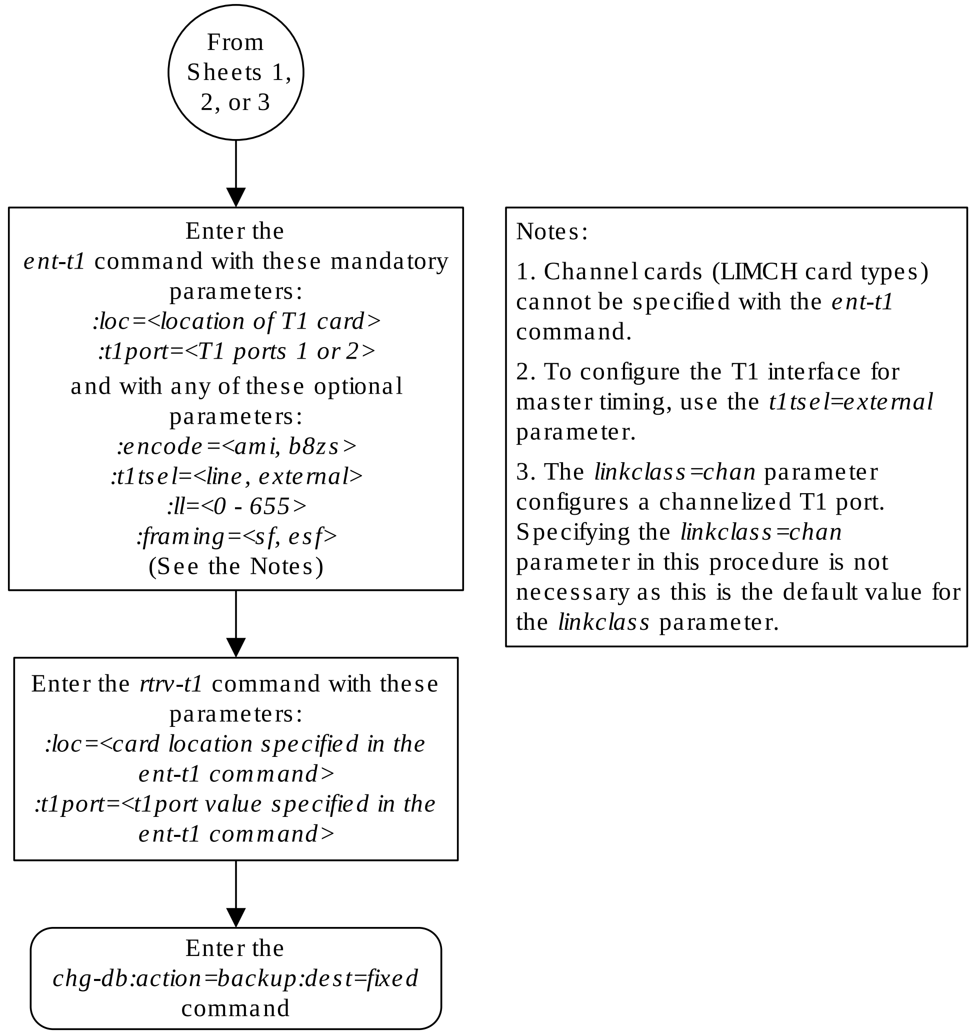
Notes:

1. The E1/T1 MIM can have only T1 ports 1 and 2 assigned to it.
2. The HC MIM or E5-E1T1 card can have T1 ports 1 through 8 assigned to it.

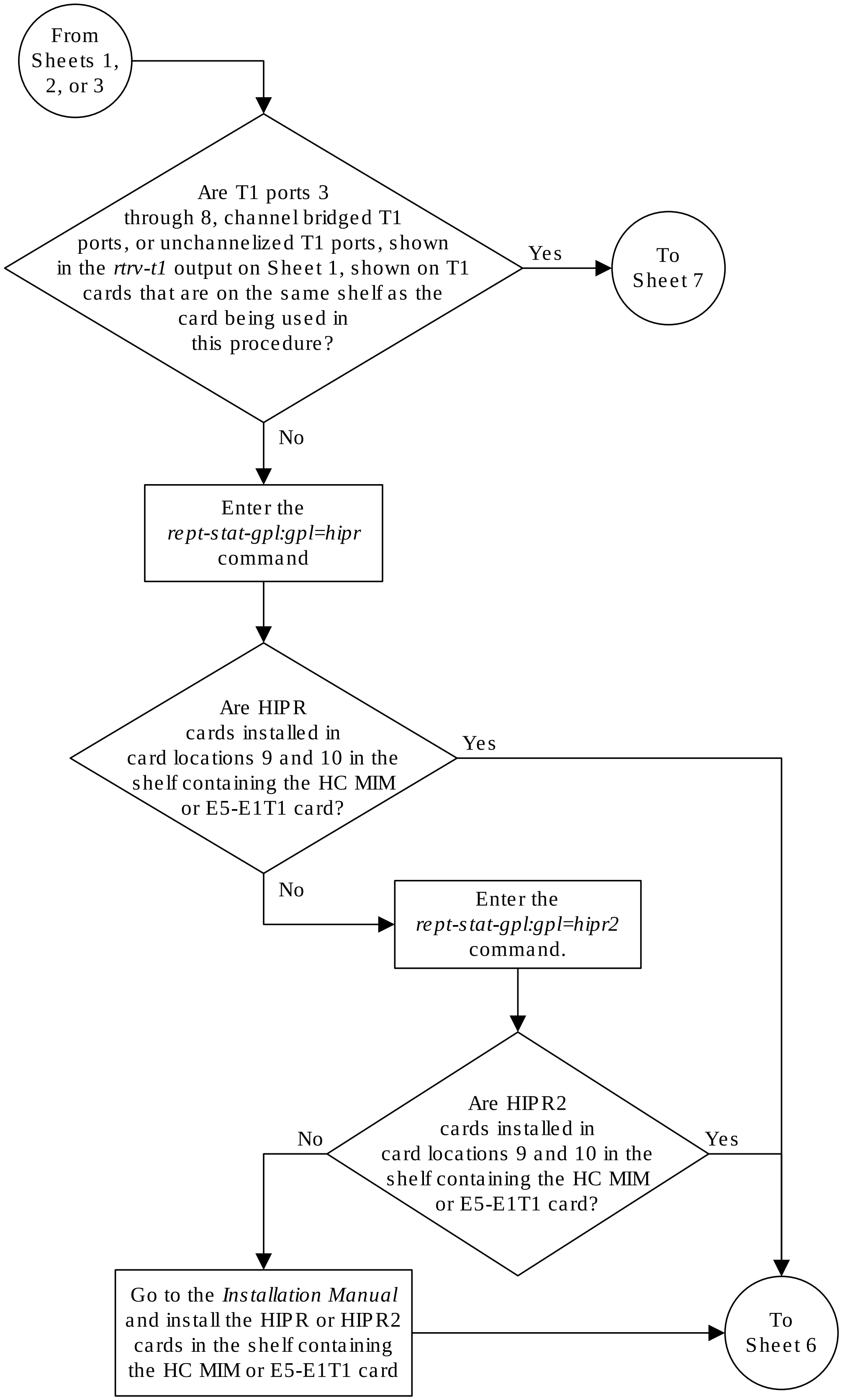
Sheet 2 of 7


From Sheet 1
Enter the *rtrv-card* command
Is the desired T1 card shown in the *rtrv-card* output?
No
Perform the "Adding a LIM-T1 Card" procedure in this appendix and add a new T1 card to the database.
If you wish to assign T1 ports 3, 4, 5, 6, 7, or 8 to the T1 card, the new T1 card must be an HC MIM or E5-E1T1 card. The new T1 card cannot be a channel card.
Yes
Verify the type of the T1 card. The T1 card can be one of three types.
Card Type **Part Number**
E1/T1 MIM 870-2198-XX
HC MIM 870-2671-XX
E5-E1T1 870-1873-XX
What type of T1 card was added?
E1/T1 MIM
HC MIM or E5-E1T1
What type of T1 card is the T1 port being added to?
HC MIM or E5-E1T1
To Sheet 5
E1/T1 MIM
To Sheet 4

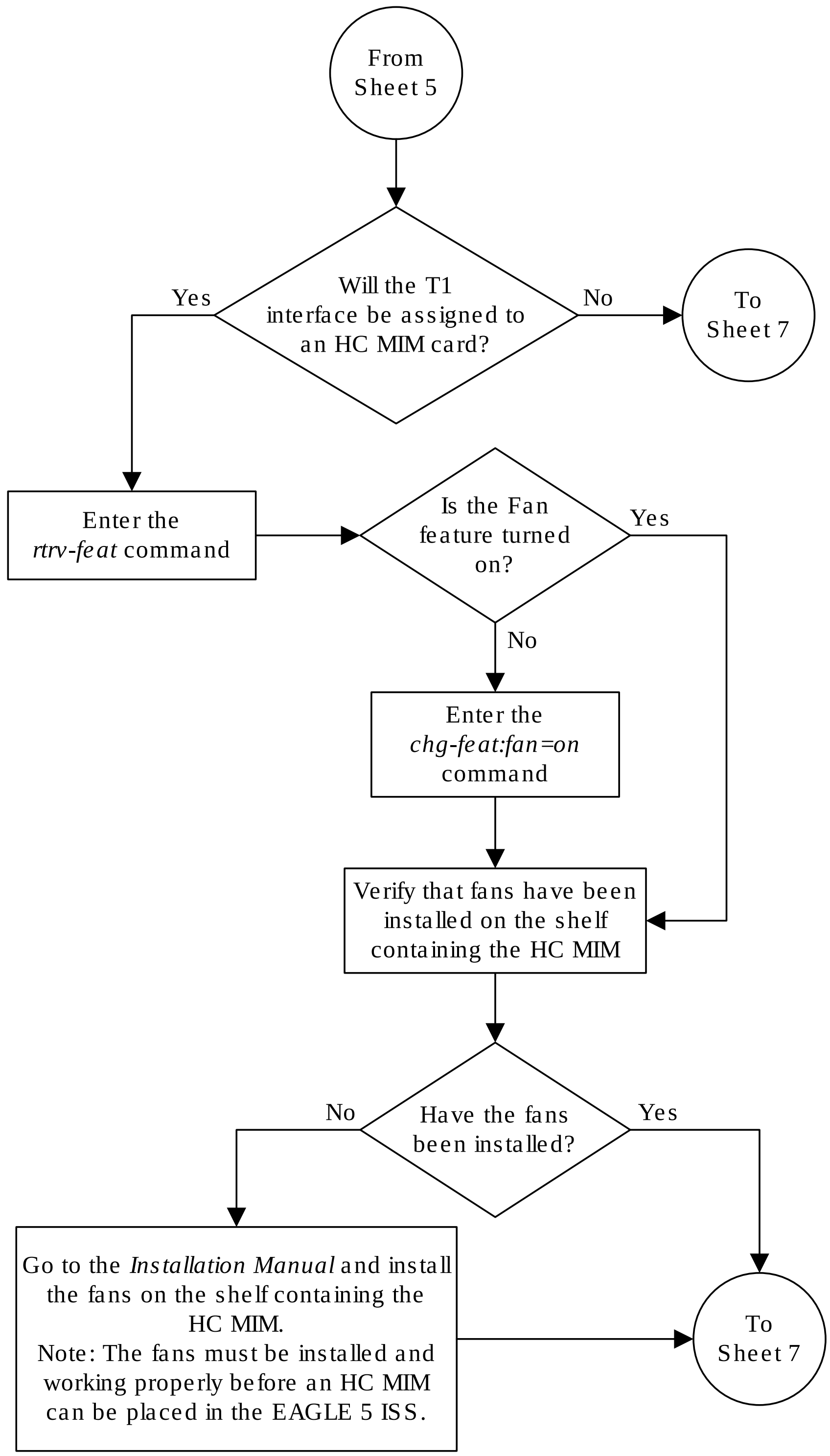
Sheet 3 of 7


From Sheets 1, 2, or 3
Enter the *ent-t1* command with these mandatory parameters:
:loc=<location of T1 card>
:t1port=<T1 ports 1 or 2>
and with any of these optional parameters:
:encode=<ami, b8zs>
:t1tsel=<line, external>
:ll=<0 - 655>
:framing=<sf, esf>
(See the Notes)
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the *ent-t1* command.
2. To configure the T1 interface for master timing, use the *t1tsel=external* parameter.
3. The *linkclass=chan* parameter configures a channelized T1 port. Specifying the *linkclass=chan* parameter in this procedure is not necessary as this is the default value for the *linkclass* parameter.
Enter the *rtrv-t1* command with these parameters:
:loc=<card location specified in the ent-t1 command>
:t1port=<t1port value specified in the ent-t1 command>
Enter the *chg-db:action=backup:dest=fixed* command

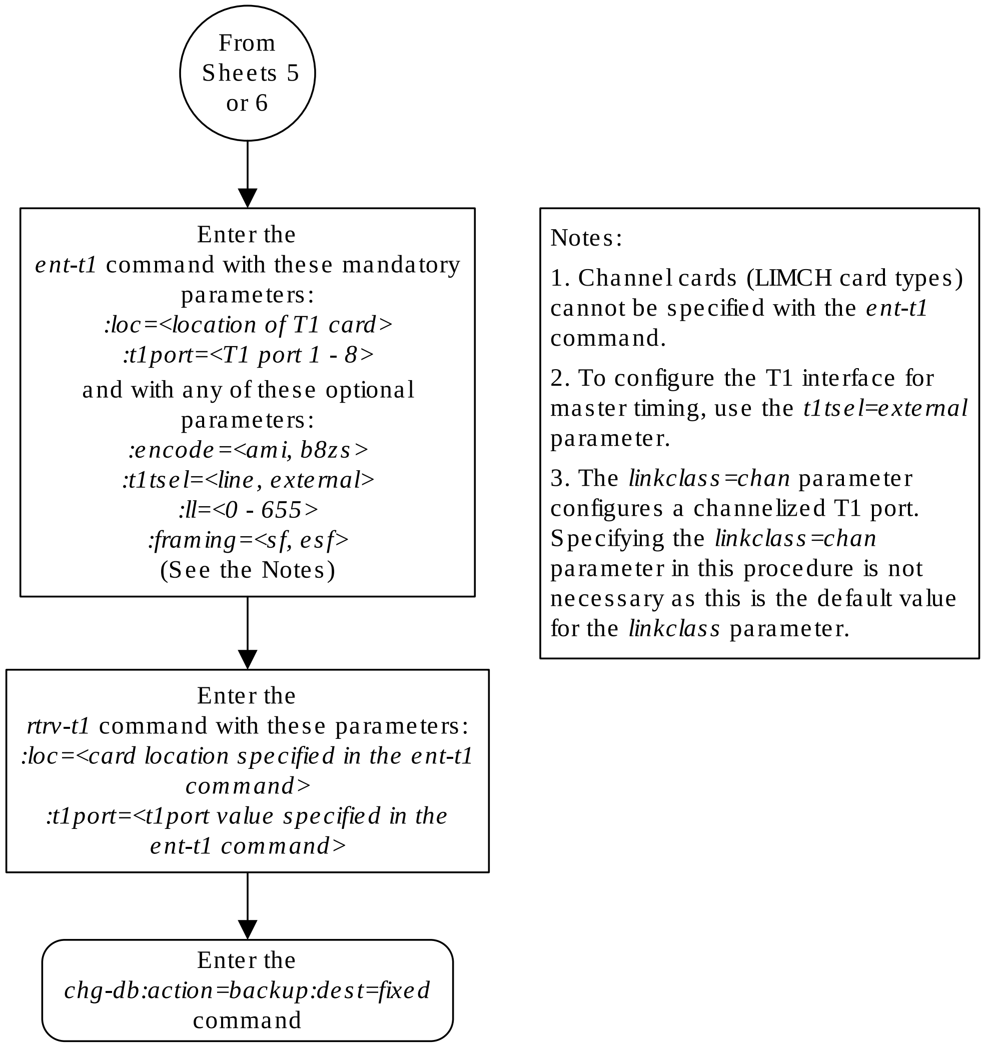
Sheet 4 of 7


From Sheets 1, 2, or 3
Are T1 ports 3 through 8, channel bridged T1 ports, or unchannelized T1 ports, shown in the rtrv-t1 output on Sheet 1, shown on T1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 7
No
Enter the rept-stat-gpl:gpl=hipr command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the rept-stat-gpl:gpl=hipr2 command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the Installation Manual and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 6

Sheet 5 of 7


From Sheet 5
Will the T1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 7
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 7

Sheet 6 of 7


From Sheets 5 or 6
Enter the *ent-t1* command with these mandatory parameters:
:loc=<location of T1 card>
:t1port=<T1 port 1 - 8>
and with any of these optional parameters:
:encode=<ami, b8zs>
:t1tsel=<line, external>
:ll=<0 - 655>
:framing=<sf, esf>
(See the Notes)
Enter the *rtrv-t1* command with these parameters:
:loc=<card location specified in the ent-t1 command>
:t1port=<t1port value specified in the ent-t1 command>
Enter the *chg-db:action=backup:dest=fixed* command
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the *ent-t1* command.
2. To configure the T1 interface for master timing, use the *t1tsel=external* parameter.
3. The *linkclass=chan* parameter configures a channelized T1 port. Specifying the *linkclass=chan* parameter in this procedure is not necessary as this is the default value for the *linkclass* parameter.

Sheet 7 of 7

B.7 Adding Channel Bridged T1 Ports

The channel bridged **T1** ports are provisioned in the database using the `ent-t1` command using these parameters.

`:loc` – The location of the T1 card (card type `limt1`) that is servicing the T1 signaling link. The T1 card must be an **HC MIM** or an **E5-E1T1** card. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:t1port` – The T1 port on the T1 card used to service the T1 signaling link. The `t1port` value cannot already be assigned to the T1 card specified by the `loc` parameter.

`:encode` – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**. The default value is B8ZS encoding (`encode=b8zs`).

`:t1tsel` – The timing source for the T1 signaling link, master (`external`) or `recovered`. The default value is slave timing (`t1tsel=line`) which cannot be used for a channel bridged t1 port.

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, **TDMs** 870-0774-15 or later must be installed in card locations 1114 and 1116, and the TDM Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:framing` – Specifies the framing format to be used on the TI signaling link, either `sf` or `esf`. The default value is `sf` (`framing=sf`).

`:ll` – The length of the cable, in feet, used for the T1 signaling link. The value of the `ll` parameter is from 0 to 655. The default value for this parameter is 133.

`:force=yes` – Required when the even numbered T1 port being channel bridged is provisioned in the database before this procedure is performed.

`:chanbrdg` – Specifies whether or not the odd numbered T1 port specified in this procedure is channel bridged to its adjacent even numbered T1 port. Table B-9 shows the T1 ports that can be specified with the `chanbrdg=on` parameter and the even-numbered T1 ports that are bridged to the odd numbered T1 port.

Table B-9 Channel Bridging Ports

Odd Numbered T1 Port	Even Numbered Bridged T1 Port
1	2
3	4

Table B-9 (Cont.) Channel Bridging Ports

Odd Numbered T1 Port	Even Numbered Bridged T1 Port
5	6
7	8

The `ent-t1` command contains the `framing=esfperf`, `linkclass`, and `minsurate` parameters that are not used in this procedure. These parameters and their usage are described in Adding Unchannelized T1 Ports.

The T1 card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

The T1 card cannot contain channelized and un-channelized **T1** ports.

1. Display the cards in the **EAGLE** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1207   LIMT1     SS7ANSI  lsnt265     A    0
1208   LIMCH     SS7ANSI  lsnt265     A    1   lsnt265     A2   2
1211   LIME1     CCS7ITU  lsne145     A    0
1212   LIMCH     CCS7ITU  lsne145     A    1   lsne145     A2   2
1215   LIMT1     SS7ANSI
1216   LIMCH     SS7ANSI
```

   If there are no **LIMT1** cards shown in the `rtrv-card` output, perform Adding a LIM-T1 Card to add an HC-MIM or E5-E1T1 card to the database. Continue the procedure with 2.

   If **LIMT1** cards are shown in the `rtrv-card` output, continue the procedure with 2.

2. Display the existing T1 interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                              LINK    MINSU
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1207  1     AMI     EXTERNAL  ESF      50   -----     CHAN    ----
```

   Channel bridged T1 ports cannot be added to a T1 card containing unchannelized T1 ports. If the T1 card contains unchannelized T1 ports, choose another T1 card from 1 and repeat this step, or add a new H- MIM or an E5-E1T1 card by performing Adding a LIM-T1 Card.

If the `rtrv-t1` output shows that the T1 card has T1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that T1 ports on the T1 card are channel bridged, continue the procedure with 3.

If the `rtrv-t1` output shows that the T1 card does not have T1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that T1 ports on the T1 card are not channel bridged, verify that the T1 card that the channel bridged T1 port will be assigned to is an HC-MIM or an E5-E1T1 card. The part number of the HC-MIM is 870-2671-XX. The part number of the E5-E1T1 is 870-1873-XX. If the T1 card is not an HC-MIM or an E5-E1T1 card, add a new HC-MIM or an E5-E1T1 card by performing Adding a LIM-T1 Card.

After the new HC-MIM or E5-E1T1 card has been added, continue the procedure with 8.

Continue the procedure by performing one of these substeps:

a. If the `rtrv-t1` output shows that the T1 card has T1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that T1 ports on the T1 card are channel bridged, continue this procedure with 3.

b. Channel bridged T1 ports cannot be added to an T1 card containing unchannelized T1 ports. If the T1 card contains unchannelized T1 ports, choose another T1 card from 1 and repeat this step, or add a new HC-MIM or an E5-E1T1 card by performing Adding a LIM-T1 Card.

c. If the `rtrv-t1` output shows that the T1 card does not have T1 ports 3, 4, 5, 6, 7, or 8 assigned to it, or that T1 ports on the T1 card are not channel bridged, verify that the T1 card that the channel bridged T1 port will be assigned to is an HC-MIM or an E5-E1T1 card. The part number of the HC-MIM is 870-2671-XX. The part number of the E5-E1T1 is 870-1873-XX. If the T1 card is not an HC-MIM or an E5-E1T1 card, add a new HC-MIM or an E5-E1T1 card by performing Adding a LIM-T1 Card.

   - If an existing T1 card is being used in this procedure continue the procedure with 3.
   - If an HC-MIM or an E5-E1T1 card was added in this substep or substep b, continue the procedure by performing one of these steps.
     – If the T1 cards shown in this step are on the same shelf as the card that will contain the T1 port that is being added, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure with 8.
     – If the T1 cards shown in this step are not on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 4.
     – If the T1 cards shown in this step are on the same shelf as the card that will contain the T1 port that is being added, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 4.

3. Display the T1 signaling links in the EAGLE by entering this command.

```
rtrv-slk:class=t1
```

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                  L2T                PCR  PCR    T1    T1
LOC   LINK LSN         SLC TYPE   SET  BPS     ECM   N1   N2     LOC   PORT
TS
1207 A     lsnt256       0  LIMT1    1    56000   BASIC ---   ----- 1207  2
```

```
2
1208 A     lsnt256      1  LIMCH    1    56000  BASIC ---  -----
1207 1     4
1208 A2    lsnt256      2  LIMCH    1    56000  BASIC ---  -----
1207 1     6
```

If an even numbered T1 port is to be channel bridged, and that T1 port is assigned to signaling links, these signaling links must be removed before the T1 port can be channel bridged. Perform Removing an SS7 Signaling Link to remove these signaling links. After the signaling links have been removed, continue the procedure with 4.

If the even numbered T1 port to be channel bridged is not assigned to signaling links, continue the procedure with 4.

4. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the T1 port being added in this procedure by entering this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD      RUNNING            APPROVED      TRIAL
HIPR2       1109      126-002-000        126-002-000   126-003-000
HIPR2       1110      126-002-000        126-002-000   126-003-000
HIPR2       1209      126-002-000        126-002-000   126-003-000
HIPR2       1210      126-002-000        126-002-000   126-003-000
HIPR2       1309      126-002-000        126-002-000   126-003-000
HIPR2       1310      126-002-000        126-002-000   126-003-000
HIPR2       2109      126-002-000        126-002-000   126-003-000
HIPR2       2110      126-002-000        126-002-000   126-003-000
Command Completed
```

   If **HIPR2** cards are installed in the shelf containing the HC MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure with 8.
   - If the card is an HC MIM, continue the procedure with 5.

   If HIPR2 cards are not installed on the shelf containing the HC MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure with 8.
   - If the card is an HC MIM, continue the procedure with 5.

5. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

Note:

The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

If the Fan feature is on, continue the procedure with 8.

If the Fan feature is off, continue the procedure with 6.

6. Turn the Fan feature on by entering this command.

   `chg-feat:fan=on`

   Note:

   Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
   The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 09-05-28 11:43:04 GMT EAGLE5 41.0.0
CHG-FEAT: MASP A - COMPLTD
```

7. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

   If the fans are installed, continue the procedure with 8.

   If the fans are not installed on the shelf containing the HC-MIM, go to *Installation Guide* and install the fans. After the fans have been installed and tested, continue the procedure with 8.

8. Add the new T1 interface information to the database using the `ent-t1` command and the parameter combinations shown in Table B-10.

Table B-10 Channel Bridged T1 Port Combinations

Mandatory Parameters	
:loc=location of the T1 card	:t1tsel=external, recovered
:t1port=1, 3, 5, 7	:chanbrdg=on
Optional Parameters	
:framing=sf, esf Default value = sf	:ll=0 - 655 Default value = 133

Table B-10 (Cont.) Channel Bridged T1 Port Combinations

:encode=ami, b8zs Default value = b8zs	:force=yes
Notes: 1. Channel cards (LIMCH card type) cannot be specified with the `ent-t1` command. 2. To configure the T1 port for master timing, use the `t1tsel=external` parameter. 3. The `linkclass=chan` parameter configures a channelized T1 port. Specifying the `linkclass=chan` parameter in this procedure is unnecessary as this is the default value for the `linkclass` parameter. 4. The T1 card cannot contain channelized and un-channelized T1 ports. 5. The `force=yes` parameter must be used when the even numbered port being channel bridged is shown in the `rtrv-t1` output in 2. If the even numbered port being channel bridged is not shown in the `rtrv-t1` output in 2, the `force=yes` parameter cannot be used.	

For this example, enter these commands.

```
ent-
t1:loc=1215:t1port=1:encode=b8zs:t1tsel=external:chanbrdg=on
```

```
ent-
t1:loc=1217:t1port=1:encode=ami:t1tsel=recovered :chanbrdg=o
n
```

9. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 8. For this example, enter these commands.

```
rtrv-t1:loc=1215:t1port=1
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                               LINK    MINSU
LOC   PORT   ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1215  1      B8ZS    EXTERNAL  SF       133  MASTER    CHAN    ----

TS1  ------   TS9   ------   TS17  ------
TS2  ------   TS10  ------   TS18  ------
TS3  ------   TS11  ------   TS19  ------
TS4  ------   TS12  ------   TS20  ------
TS5  ------   TS13  ------   TS21  ------
TS5  ------   TS14  ------   TS22  ------
TS7  ------   TS15  ------   TS23  ------
TS8  ------   TS16  ------   TS24  ------
```

```
rtrv-t1:loc=1217:t1port=1
```

This is an example of the possible output.

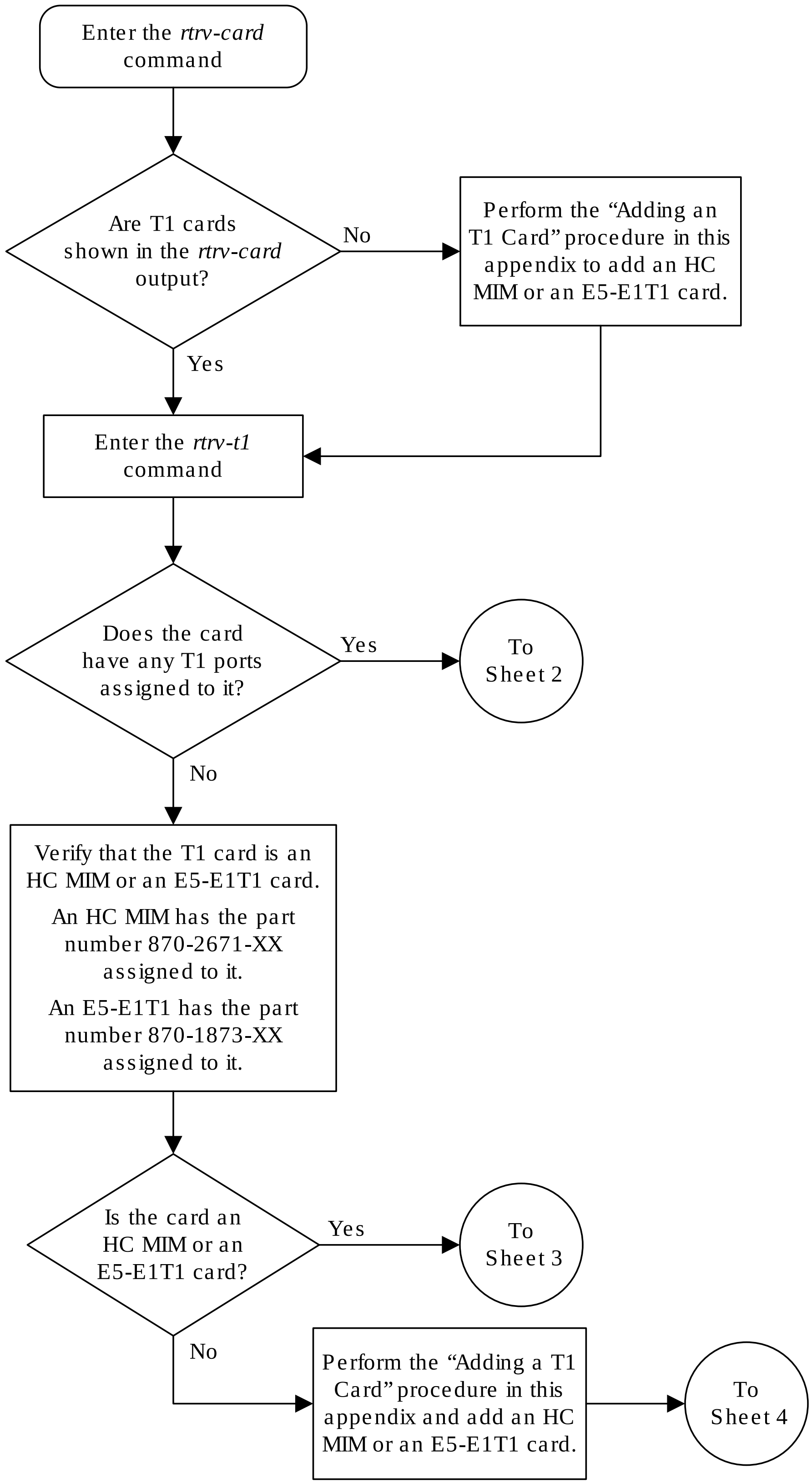
```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                               LINK    MINSU
LOC   PORT   ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1217  1      AMI     RECOVERED SF       133  MASTER    CHAN    ----
```

```
TS1  ------    TS9   ------    TS17  ------
TS2  ------    TS10  ------    TS18  ------
TS3  ------    TS11  ------    TS19  ------
TS4  ------    TS12  ------    TS20  ------
TS5  ------    TS13  ------    TS21  ------
TS5  ------    TS14  ------    TS22  ------
TS7  ------    TS15  ------    TS23  ------
TS8  ------    TS16  ------    TS24  ------
```

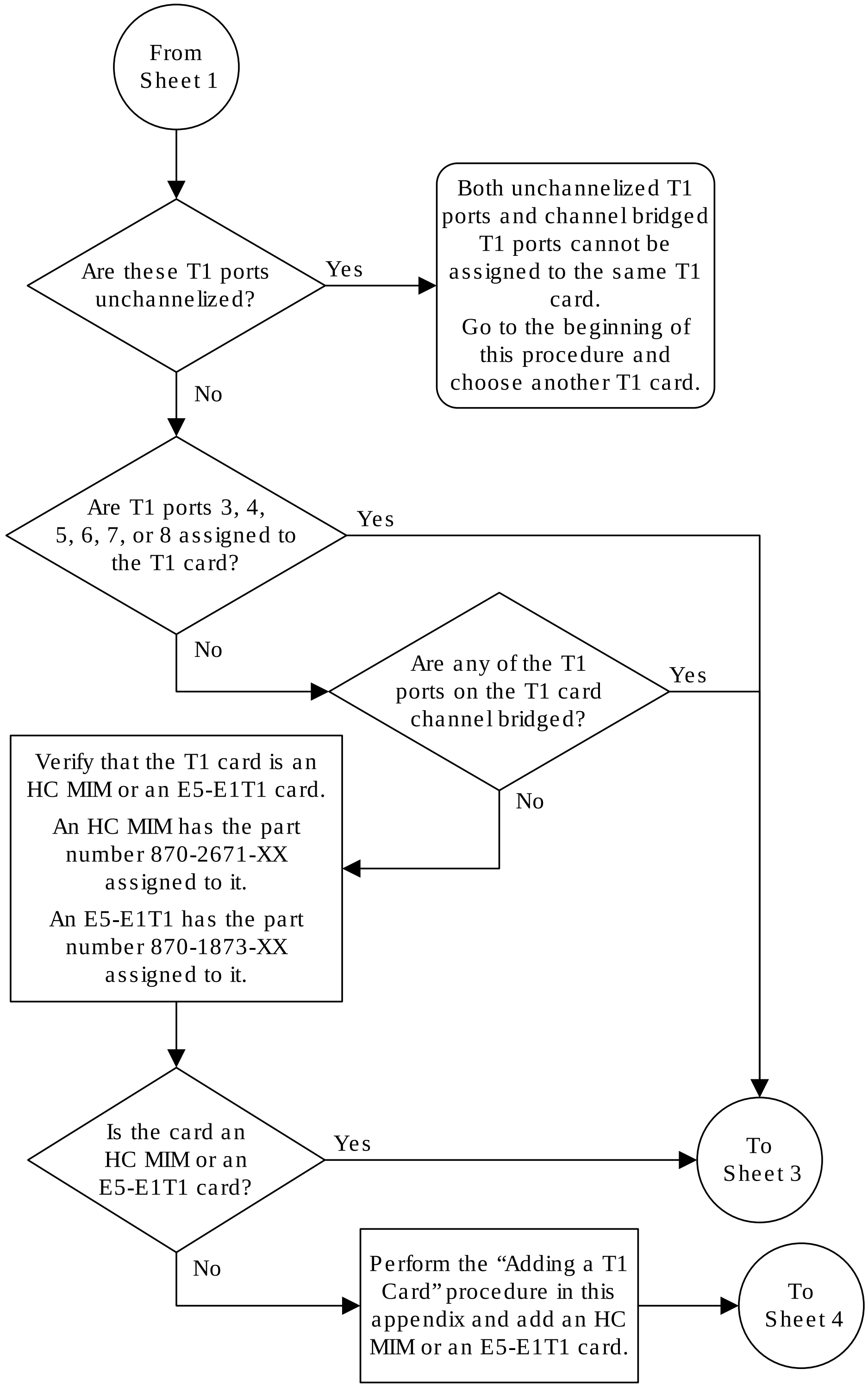
10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

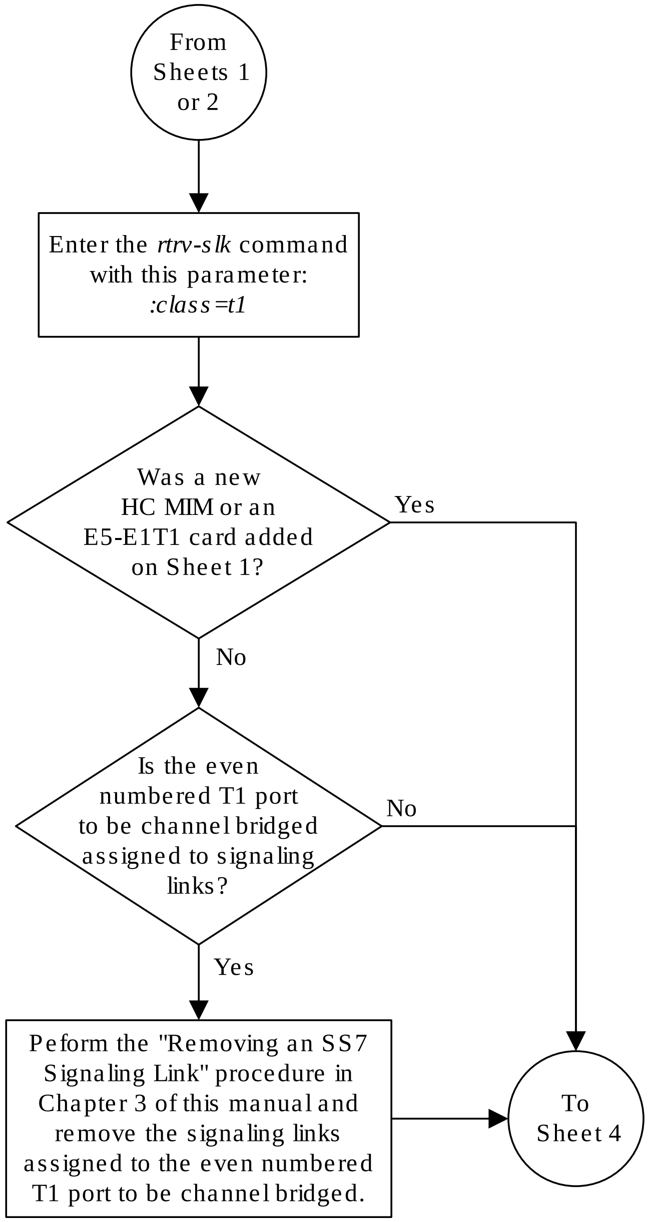
Figure B-7 Adding Channel Bridged T1 Ports



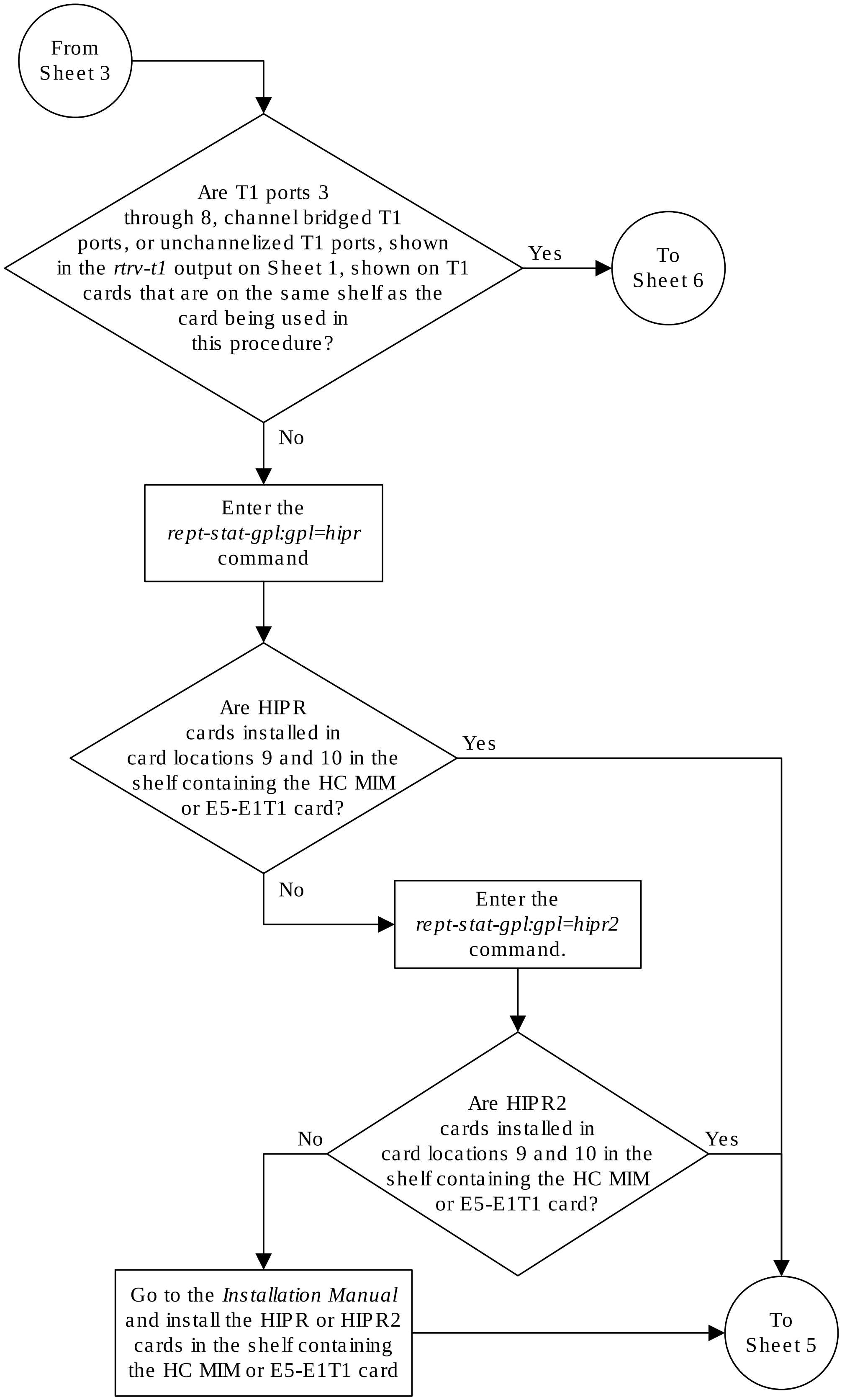
Sheet 1 of 6


From Sheet 1
Are these T1 ports unchannelized?
Yes
Both unchannelized T1 ports and channel bridged T1 ports cannot be assigned to the same T1 card.
Go to the beginning of this procedure and choose another T1 card.
No
Are T1 ports 3, 4, 5, 6, 7, or 8 assigned to the T1 card?
Yes
No
Are any of the T1 ports on the T1 card channel bridged?
Yes
No
Verify that the T1 card is an HC MIM or an E5-E1T1 card.
An HC MIM has the part number 870-2671-XX assigned to it.
An E5-E1T1 has the part number 870-1873-XX assigned to it.
Is the card an HC MIM or an E5-E1T1 card?
Yes
To Sheet 3
No
Perform the “Adding a T1 Card” procedure in this appendix and add an HC MIM or an E5-E1T1 card.
To Sheet 4

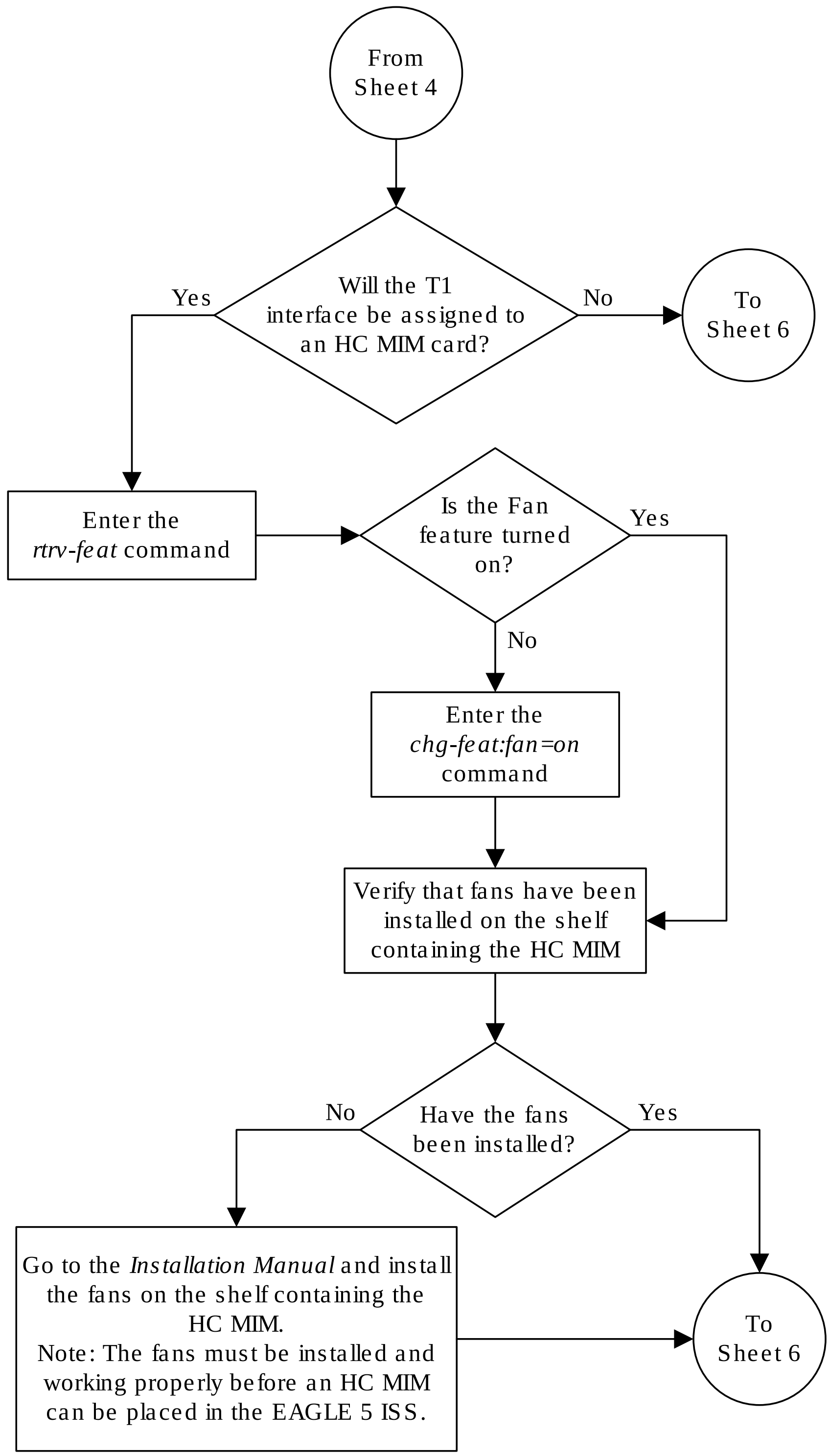
Sheet 2 of 6


From Sheets 1 or 2
Enter the *rtrv-slk* command with this parameter: *:class=t1*
Was a new HC MIM or an E5-E1T1 card added on Sheet 1?
Yes
No
Is the even numbered T1 port to be channel bridged assigned to signaling links?
No
Yes
Peform the "Removing an SS7 Signaling Link" procedure in Chapter 3 of this manual and remove the signaling links assigned to the even numbered T1 port to be channel bridged.
To Sheet 4

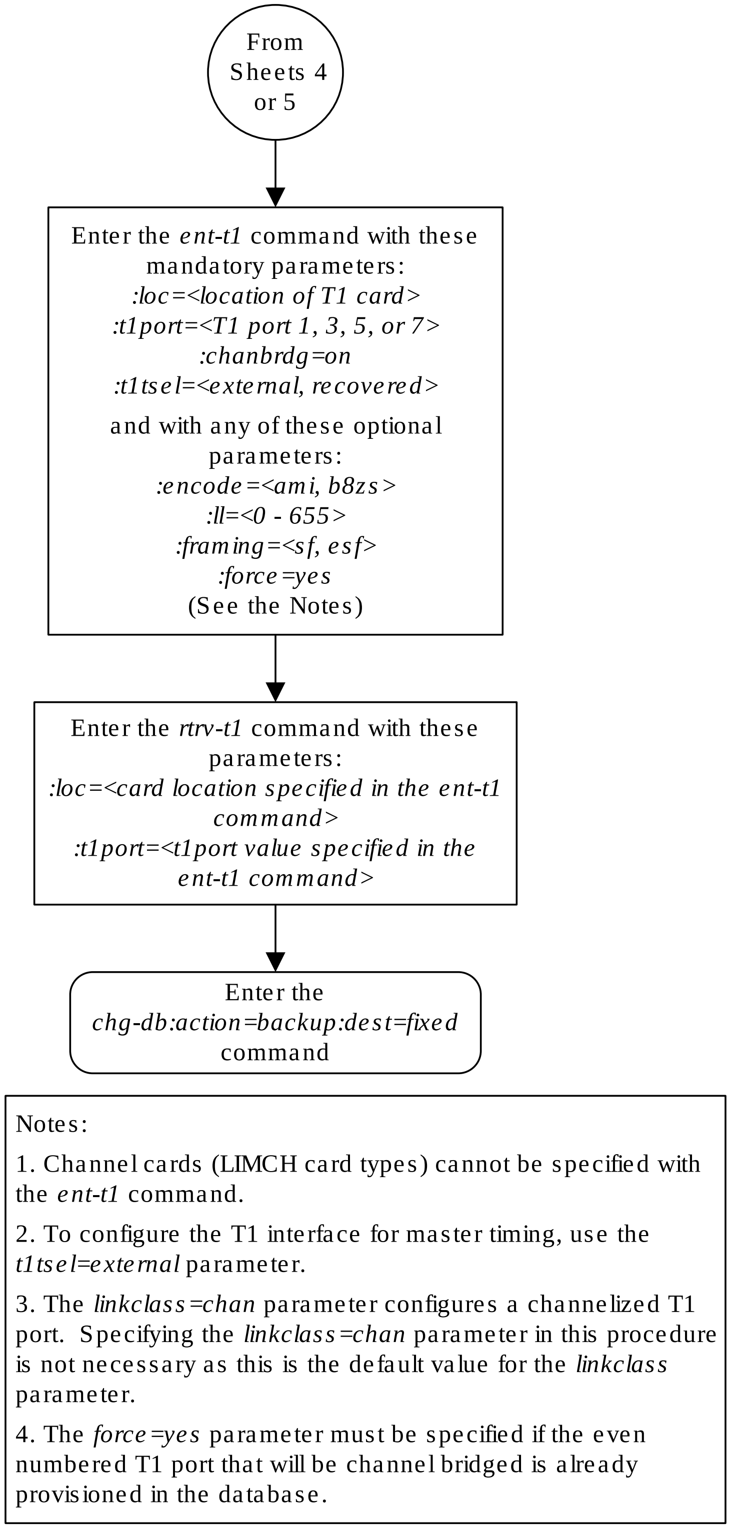
Sheet 3 of 6


From Sheet 3
Are T1 ports 3 through 8, channel bridged T1 ports, or unchannelized T1 ports, shown in the *rtrv-t1* output on Sheet 1, shown on T1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 6
No
Enter the *rept-stat-gpl:gpl=hipr* command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
Yes
No
Enter the *rept-stat-gpl:gpl=hipr2* command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card?
No
Yes
Go to the *Installation Manual* and install the HIPR or HIPR2 cards in the shelf containing the HC MIM or E5-E1T1 card
To Sheet 5

Sheet 4 of 6


From Sheet 4
Will the T1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 6
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 6

Sheet 5 of 6


From Sheets 4 or 5
Enter the *ent-t1* command with these mandatory parameters:
:loc=<location of T1 card>
:t1port=<T1 port 1, 3, 5, or 7>
:chanbrdg=on
:t1tsel=<external, recovered>
and with any of these optional parameters:
:encode=<ami, b8zs>
:ll=<0 - 655>
:framing=<sf, esf>
:force=yes
(See the Notes)
Enter the *rtrv-t1* command with these parameters:
:loc=<card location specified in the ent-t1 command>
:t1port=<t1port value specified in the ent-t1 command>
Enter the *chg-db:action=backup:dest=fixed* command
Notes:
1. Channel cards (LIMCH card types) cannot be specified with the *ent-t1* command.
2. To configure the T1 interface for master timing, use the *t1tsel=external* parameter.
3. The *linkclass=chan* parameter configures a channelized T1 port. Specifying the *linkclass=chan* parameter in this procedure is not necessary as this is the default value for the *linkclass* parameter.
4. The *force=yes* parameter must be specified if the even numbered T1 port that will be channel bridged is already provisioned in the database.

Sheet 6 of 6

B.8 Adding Unchannelized T1 Ports

An unchannelized T1 port is provisioned in the database using the `ent-t1` command with these parameters.

`:loc` – The location of the **T1** card (card type `limt1`) that is servicing the **T1** signaling link. The **T1** card must be an **E5-E1T1** card. The location of a channel card (card type `limch`) cannot be specified for this parameter.

`:t1port` – The **T1** port on the **T1** card used to service the **T1** signaling link. The `t1port` value cannot already be assigned to the **T1** card specified by the `loc` parameter.

`:encode` – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**. The default value is **B8ZS** encoding (`encode=b8zs`).

`:t1tsel` – The timing source for the T1 signaling link, master (`external`) or slave (`line`). The default value is slave timing (`t1tsel=line`).

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and cannot be used in this procedure.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, **TDMs** 870-0774-15 or later must be installed in card locations 1114 and 1116, and the TDM Global Timing Interface options must be configured. For more information, refer to Configuring the Options for the TDM Global Timing Interface.

`:framing` – Specifies the framing format to be used on the TI signaling link, either `sf`, `esf`, or `esfperf`. The `esfperf` value enables T1 performance monitoring for low level reports embedded in the transmit data stream of a T1 interface configured for ESF framing. The default value is `sf` (`framing=sf`).

`:ll` – The length of the cable, in feet, used for the T1 signaling link. The value of the `ll` parameter is from 0 to 655. The default value for this parameter is 133.

`:linkclass=unchan` – Indicates that the **T1** port supports un-channelized T1 signaling links.

`:minsurate` – Specifies the minimum number of signaling units (**FISUs** and **LSSU**s) per second that are transmitted on the outbound **T1** signaling link during idle periods or when there is an unused portion of the link's bandwidth. The value of this parameter is from 400 to 1600 signaling units per second, with the default value of 1000 signaling units per second. The `minsurate` parameter can be specified only when an unchannelized **T1** port (`linkclass=unchan` parameter) is being configured.

The `ent-t1` command contains the `t1tsel=recovered`, `chanbrdg`, and `force=yes` parameters. These parameters are not used in this procedure. These parameters and their usage are described in Adding Channel Bridged T1 Ports.

The **T1** card specified in this procedure must be in the database. This can be verified with the `rtrv-card` command.

1. Display the cards in the **EAGLE** using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME    LINK SLC LSET NAME    LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIMT1     CCS7ITU  lsn1         A    13  lsn1         B    12
1202   LIMCH     CCS7ITU  lsn1         A    0   lsn1         B    8
1203   LIMT1     CCS7ITU  lsn1         A1   4   lsn1         B1   9
1204   LIMCH     CCS7ITU  lsn1         A2   5   lsn1         A3   6
1211   LIMT1     CCS7ITU  lsn1         A    14
1212   LIMCH     CCS7ITU  lsn1         A    10  lsn1         B    11
1213   LIMT1     CCS7ITU  lsn1         A4   1   lsn1         A5   7
                          lsn1         B5   2   lsn1         A6   3
```

If there no **LIMT1** cards shown in the `rtrv-card` output, perform Adding a LIM-T1 Card to add an **E5-E1T1** card to the database. After the card has been added, continue the procedure with 2

2. Display the existing **T1** interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                LINK    MINSU
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1201  1     AMI     EXTERNAL  ESF      50   -----     CHAN    ----
1201  2     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1202  1     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1203  1     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1203  2     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1204  1     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1211  2     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1212  1     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1213  1     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
1213  5     B8ZS    EXTERNAL  ESF      50   -----     CHAN    ----
```

The EAGLE can contain a maximum of 180 unchannelized **T1** ports. If the `rtrv-t1` output shows that there are 180 unchannelized T1 ports, no other unchannelized T1 ports can be added and this procedure cannot be performed.

If no T1 ports are assigned to the T1 card you wish to use in this procedure, verify that the T1 card is an E5-E1T1 card. The part number of the E5-E1T1 card is 870-1873-XX. An E5-E1T1 card can contain only one unchannelized T1 port. No other types of T1 ports can be assigned to a T1 card that contains an unchannelized T1 port. If the T1 card is not an E5-E1T1 card, either select another

T1 card from the `rtrv-t1` output, or add a new E5-E1T1 by performing Adding a LIM-T1 Card. If the T1 card is an E5-E1T1 card, and contains no T1 ports, continue the procedure with 3.

If the unchannelized T1 port cannot be added to this card, repeat 1 and 2 to select another T1 card to add the unchannelized T1 port to, or add a new E5-E1T1 by performing Adding a LIM-T1 Card.

3. Display the status of the ST-HSL-A SLK Capacity feature by entering the `rtrv-ctrl-feat` command.

   The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name                Partnum    Status  Quantity
HC-MIM SLK Capacity         893012707  on      64
Command Class Management    893005801  on      ----
LNP Short Message Service   893006601  on      ----
Intermed GTT Load Sharing   893006901  on      ----
XGTT Table Expansion        893006101  on      400000
XMAP Table Expansion        893007701  on      3000


The following features have been temporarily enabled:

Feature Name                Partnum    Status  Quantity     Trial Period
Left
Zero entries found.

The following features have expired temporary keys:

Feature Name                Partnum
Zero entries found.
```

   Continue the procedure by performing one of these substeps.

   a. If an ST-HSL-A SLK quantity is not enabled, continue the procedure with 4.

      Note:

      If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 4 through 7 must be performed. If the `rtrv-ctrl-feat` output in this step shows any other controlled features, continue the procedure with 8.

   b. If an ST-HSL-A SLK quantity is enabled, the entry `ST-HSL-A SLK Capacity` is shown in the `rtrv-ctrl-feat` output with a quantity of 4 to 180 in increments of 8. The quantities that can be provisioned and their part numbers are shown in Table B-11. This quantity is the number of unchannelized T1 signaling links, and the number of unchannelized T1 ports, the EAGLE 5 ISS can contain. If the addition of the unchannelized T1 port in this procedure will not exceed the enabled ST-HSL-A SLK quantity, continue the procedure by performing one of these steps.

- If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are on the same shelf as the card that will contain the T1 port that is being added, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure with 11.
- If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are not on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 10.
- If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are on the same shelf as the card that will contain the T1 port that is being added, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 10.

c. If an ST-HSL-A SLK quantity is enabled, and the addition of the unchannelized T1 port in this procedure will exceed the enabled ST-HSL-A SLK quantity, increase the enabled ST-HSL-A SLK quantity by performing 8.

4. Display the serial number in the database with the `rtrv-serial-num` command.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
System serial number = nt00001231

System serial number is not locked, yet.
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with 8. If the serial number is correct but not locked, continue the procedure with 7. If the serial number is not correct, but is locked, the ST-HSL-A SLK quantity cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

5. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE’s correct serial number>`

6. Verify that the serial number entered in 5 was entered correctly using the `rtrv-serial-num` command.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
System serial number = nt00001231
```

```
System serial number is not locked, yet.
```

If the serial number was not entered correctly, repeat 4 and 5 and re-enter the correct serial number.

7. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 4, if the serial number shown in 4 is correct, or with the serial number shown in 6, if the serial number was changed in 5, and with the `lock=yes` parameter.

   For this example, enter this command.

   ```
   ent-serial-num:serial=<EAGLE's serial number>:lock=yes
   ```

8. Enable an ST-HSL-A SLK quantity by entering the `enable-ctrl-feat` command specifying the part number for the desired ST-HSL-A SLK quantity and the feature access key.

   The ST-HSL-A SLK quantity part numbers are shown in Table B-11.

   Table B-11 ST-HSL-A SLK Quantity Part Numbers

ST-HSL-A SLK Quantity	Part Number	ST-HSL-A SLK Quantity	Part Number
4	893027301	96	893027313
8	893027302	104	893027314
16	893027303	112	893027315
24	893027304	120	893027316
32	893027305	128	893027317
40	893027306	136	893027318
48	893027307	144	893027319
56	893027308	152	893027320
64	893027309	160	893027321
72	893027310	168	893027322
80	893027311	176	893027323
88	893027312	180	893027324

   For this example, enter this command.

   ```
   enable-ctrl-feat:partnum=893027301:fak=<feature access key>
   ```

   Note:

   A temporary feature access key cannot be specified to enable the ST-HSL-A SLK quantity quantity.

> **Note:**
>
> The value for the feature access key (the `fak` parameter) is provided by Oracle. If you do not have the feature access key for the ST-HSL-A SLK quantity, contact your Oracle Sales Representative or Account Representative.

9. Verify the changes by entering the `rtrv-ctrl-feat`command with the ST-HSL-A SLK quantity part number specified in 8.

   Enter this command.

   `rtrv-ctrl-feat:partnum=893027301`

   The following is an example of the possible output.

```
rlghncxa03w 09-05-28 21:15:37 GMT EAGLE5 41.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
ST-HSL-A SLK Capacity     893027301 on     4

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

   Continue the procedure by performing one of these steps.

   - If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are on the same shelf as the card that will contain the T1 port that is being added, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure with 11.
   - If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are not on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 10.
   - If T1 cards are shown in the `rtrv-t1` output in 2 and these cards are on the same shelf as the card that will contain the T1 port that is being added, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 10.

10. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the E5-E1T1 card that will contain the T1 port being added in this procedure by entering this command.

    `rept-stat-gpl:gpl=hipr2`

This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD      RUNNING            APPROVED      TRIAL
HIPR2       1109      126-002-000        126-002-000   126-003-000
HIPR2       1110      126-002-000        126-002-000   126-003-000
HIPR2       1209      126-002-000        126-002-000   126-003-000
HIPR2       1210      126-002-000        126-002-000   126-003-000
HIPR2       1309      126-002-000        126-002-000   126-003-000
HIPR2       1310      126-002-000        126-002-000   126-003-000
HIPR2       2109      126-002-000        126-002-000   126-003-000
HIPR2       2110      126-002-000        126-002-000   126-003-000
Command Completed
```

If **HIPR2** cards are installed in the shelf containing the E5-E1T1 card, continue the procedure with 11.

If HIPR2 cards are not installed on the shelf containing the E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure with 11.

11. Add the unchannelized T1 port to the database using the `ent-t1` command and the parameter combinations shown in Table B-12.

Table B-12 Unchannelized T1 Port Parameter Combinations

Mandatory Parameters		
:loc=card location of the E5-E1T1 card	:linkclass=unchan	:t1port=1, 2, 3, 4, 5, 6, 7, 8
Optional Parameters		
:encode=ami, b8zs Default value = b8zs	:t1tsel=line, external Default value = line	:ll=0 - 655 Default value = 133
:framing=sf, esf, esfperf Default value = sf	:minsurate=400 - 1600 Default value = 1000	

For this example, enter these commands.

```
ent-
t1:loc=1305:t1port=2:encode=b8zs:t1tsel=line:framing=esfperf:ll=2
00 :minsurate=1200:linkclass=unchan
```

```
ent-
t1:loc=1307:t1port=2:encode=ami:t1tsel=external:linkclass=unchan
```

12. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 11.

For this example, enter these commands.

```
rtrv-t1:loc=1305:t1port=2
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
```

```
     T1                                               LINK    MINSU
LOC  PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1305 2     B8ZS    LINE      ESFPERF  200  -----     UNCHAN  1200
```

```
rtrv-t1:loc=1307:t1port=2
```

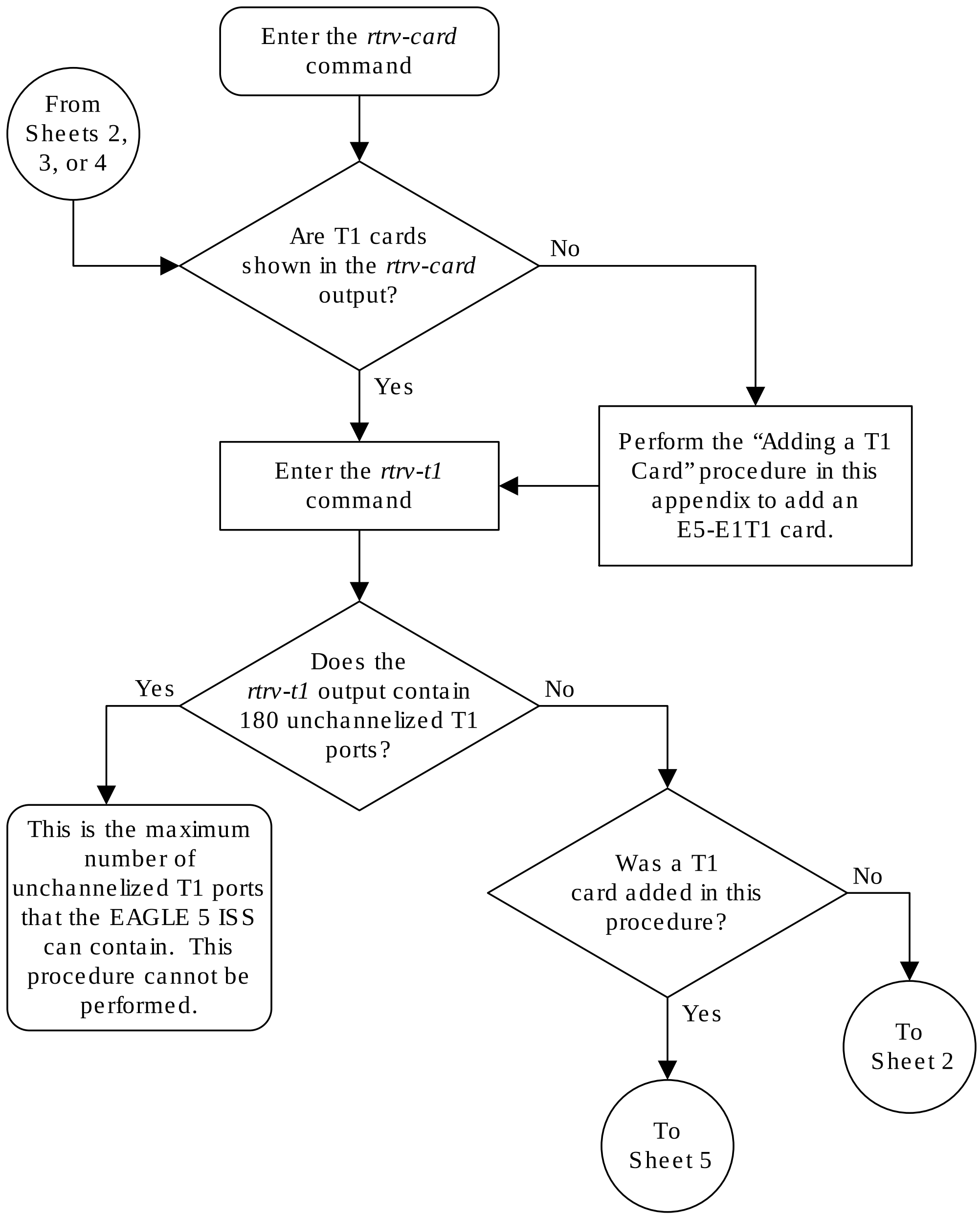
```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

     T1                                               LINK    MINSU
LOC  PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1307 2     AMI     EXTERNAL  SF       133  -----     UNCHAN  1000
```

13. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

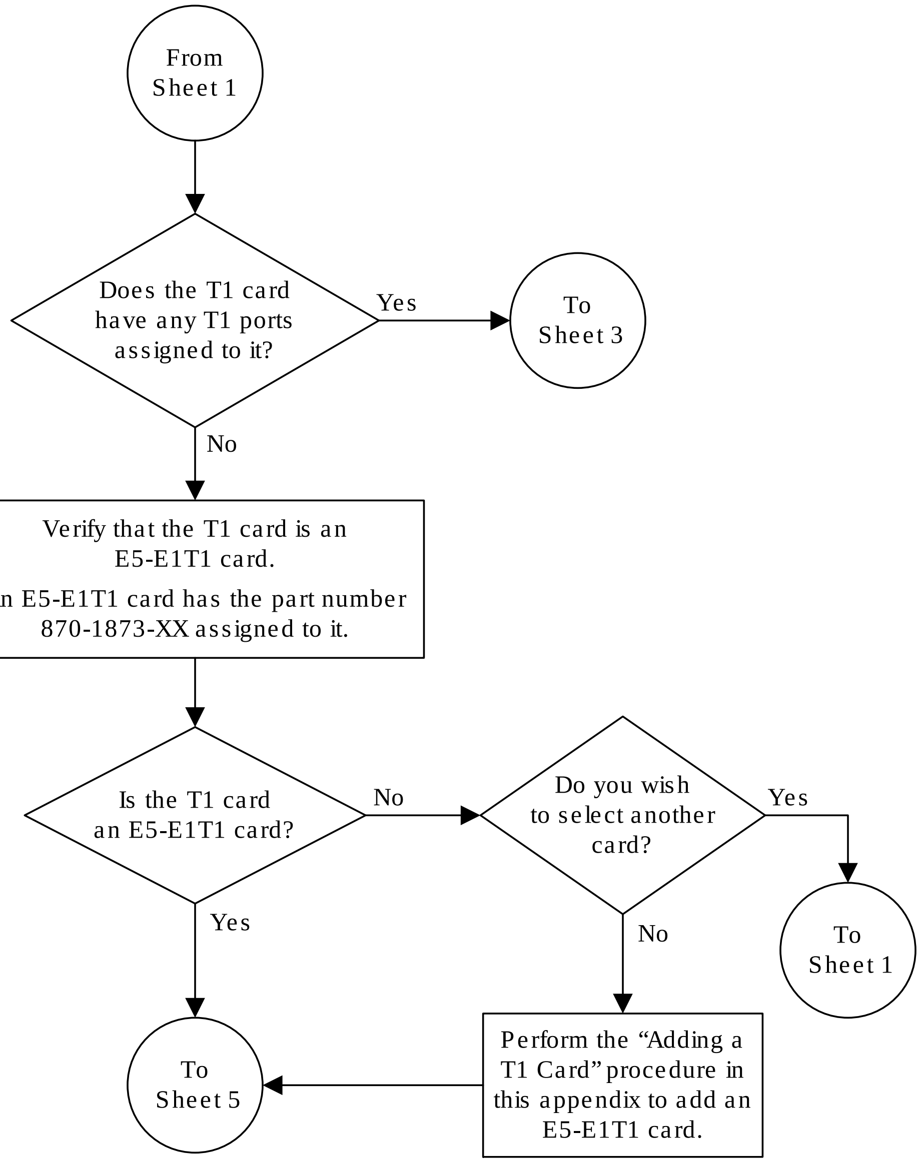
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

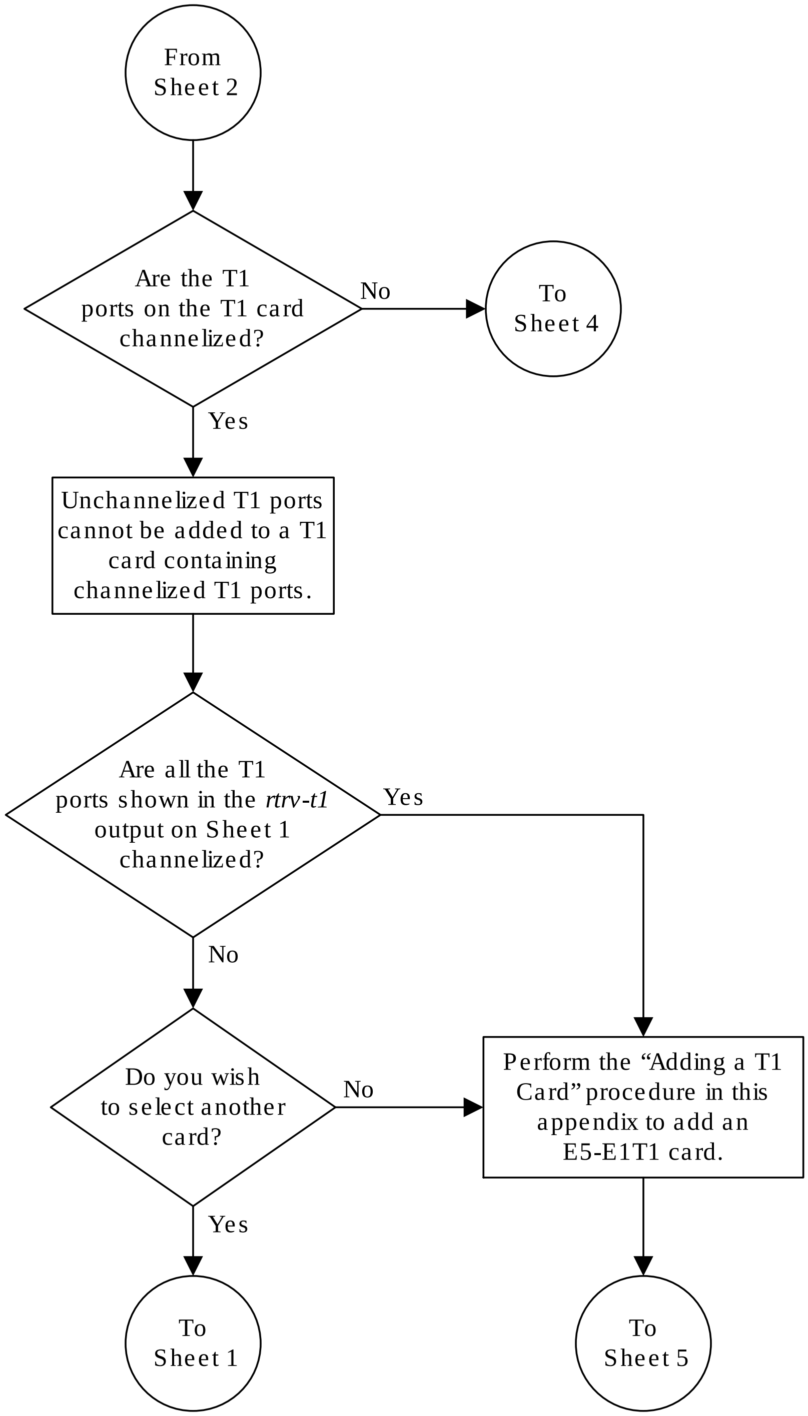
Figure B-8 Adding Unchannelized T1 Ports



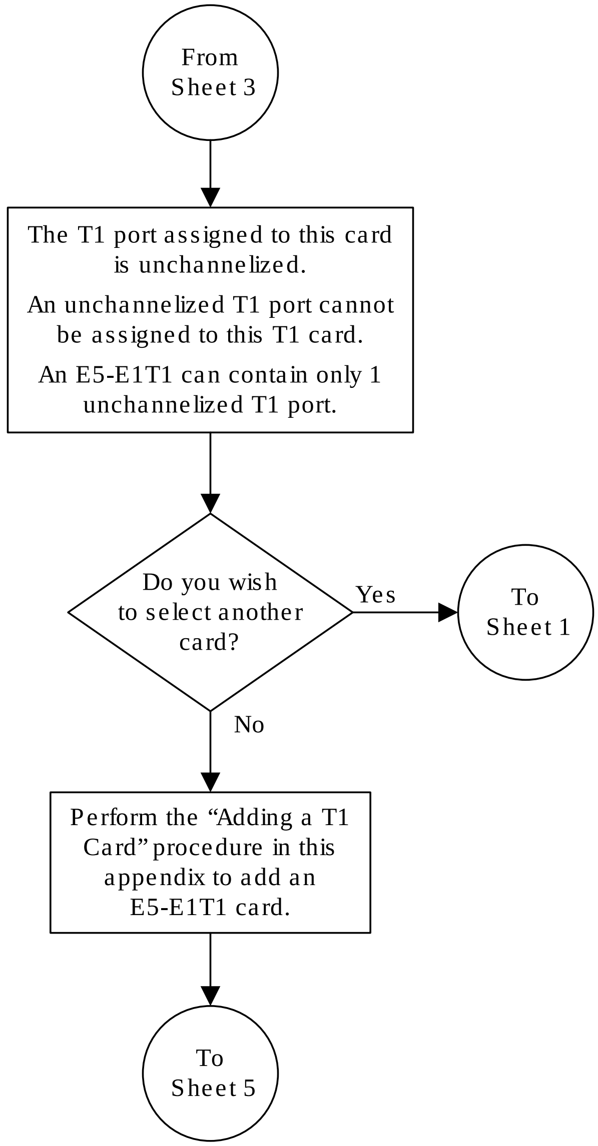
Sheet 1 of 9


From
Sheet 1
Does the T1 card
have any T1 ports
assigned to it?
Yes
To
Sheet 3
No
Verify that the T1 card is an
E5-E1T1 card.
An E5-E1T1 card has the part number
870-1873-XX assigned to it.
Is the T1 card
an E5-E1T1 card?
No
Do you wish
to select another
card?
Yes
To
Sheet 1
Yes
No
To
Sheet 5
Perform the "Adding a
T1 Card" procedure in
this appendix to add an
E5-E1T1 card.

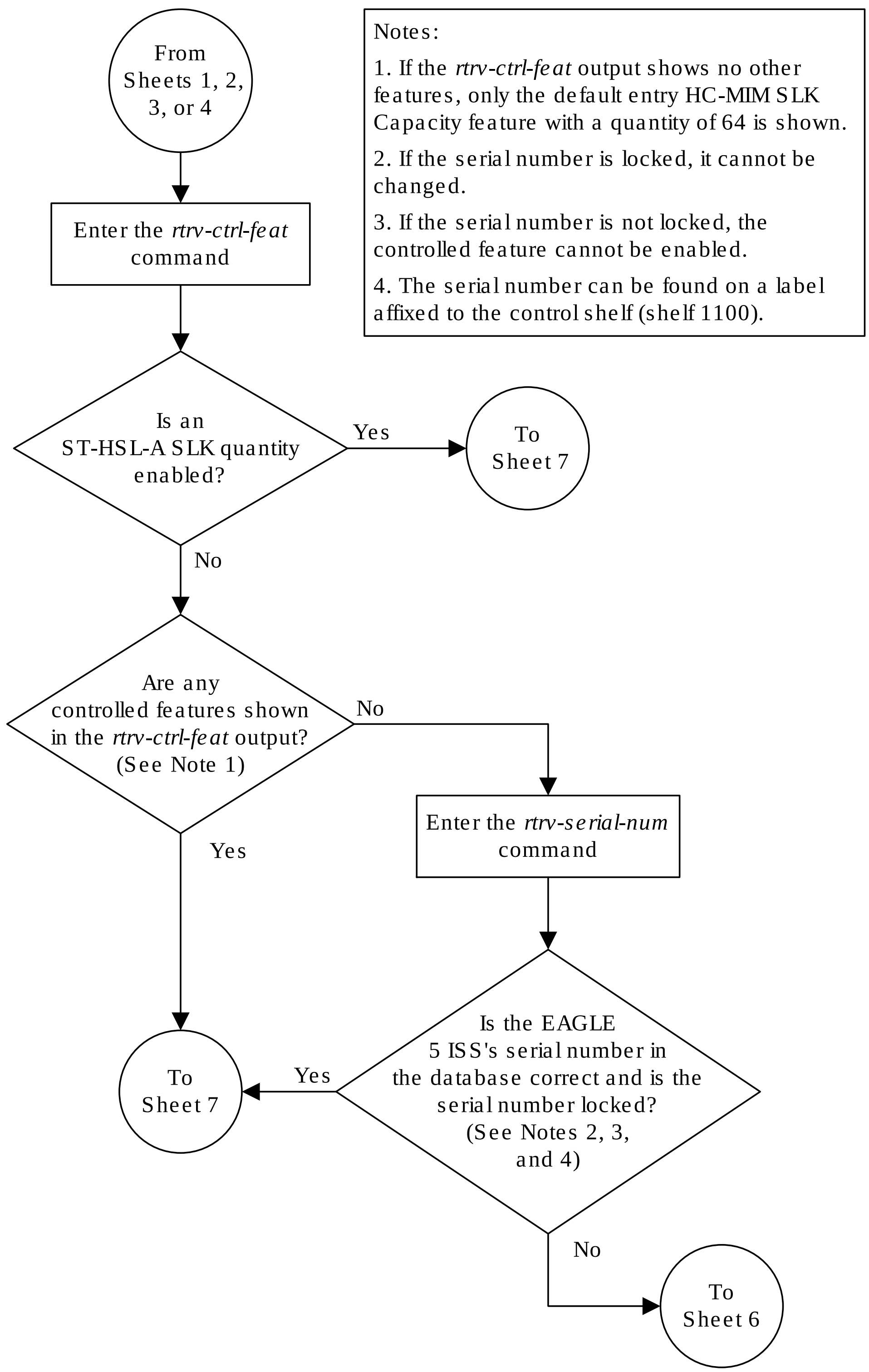
Sheet 2 of 9


From Sheet 2
Are the T1 ports on the T1 card channelized?
No
To Sheet 4
Yes
Unchannelized T1 ports cannot be added to a T1 card containing channelized T1 ports.
Are all the T1 ports shown in the *rtrv-t1* output on Sheet 1 channelized?
Yes
No
Do you wish to select another card?
No
Perform the "Adding a T1 Card" procedure in this appendix to add an E5-E1T1 card.
Yes
To Sheet 1
To Sheet 5

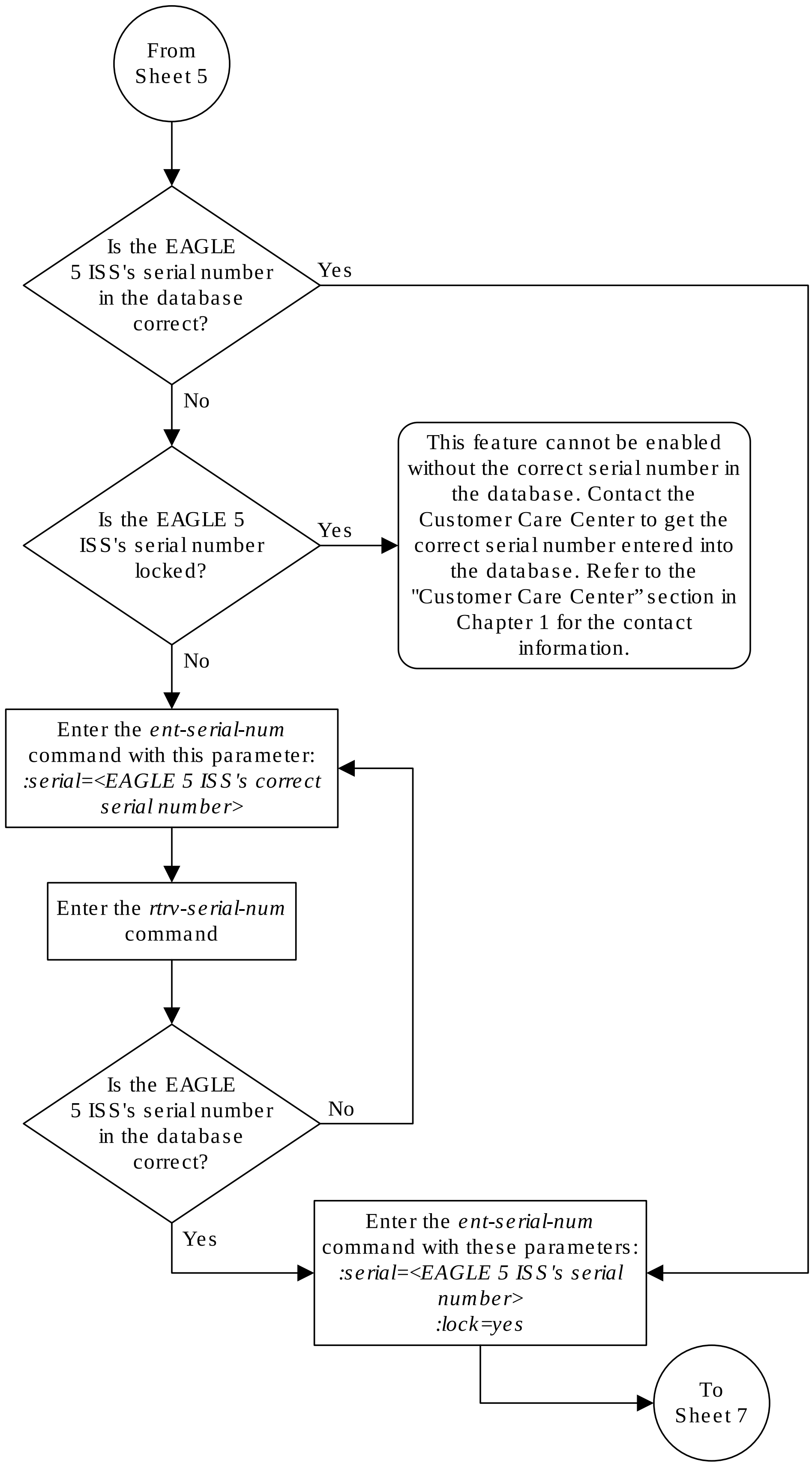
Sheet 3 of 9


From Sheet 3
The T1 port assigned to this card is unchannelized.
An unchannelized T1 port cannot be assigned to this T1 card.
An E5-E1T1 can contain only 1 unchannelized T1 port.
Do you wish to select another card?
Yes
To Sheet 1
No
Perform the "Adding a T1 Card" procedure in this appendix to add an E5-E1T1 card.
To Sheet 5

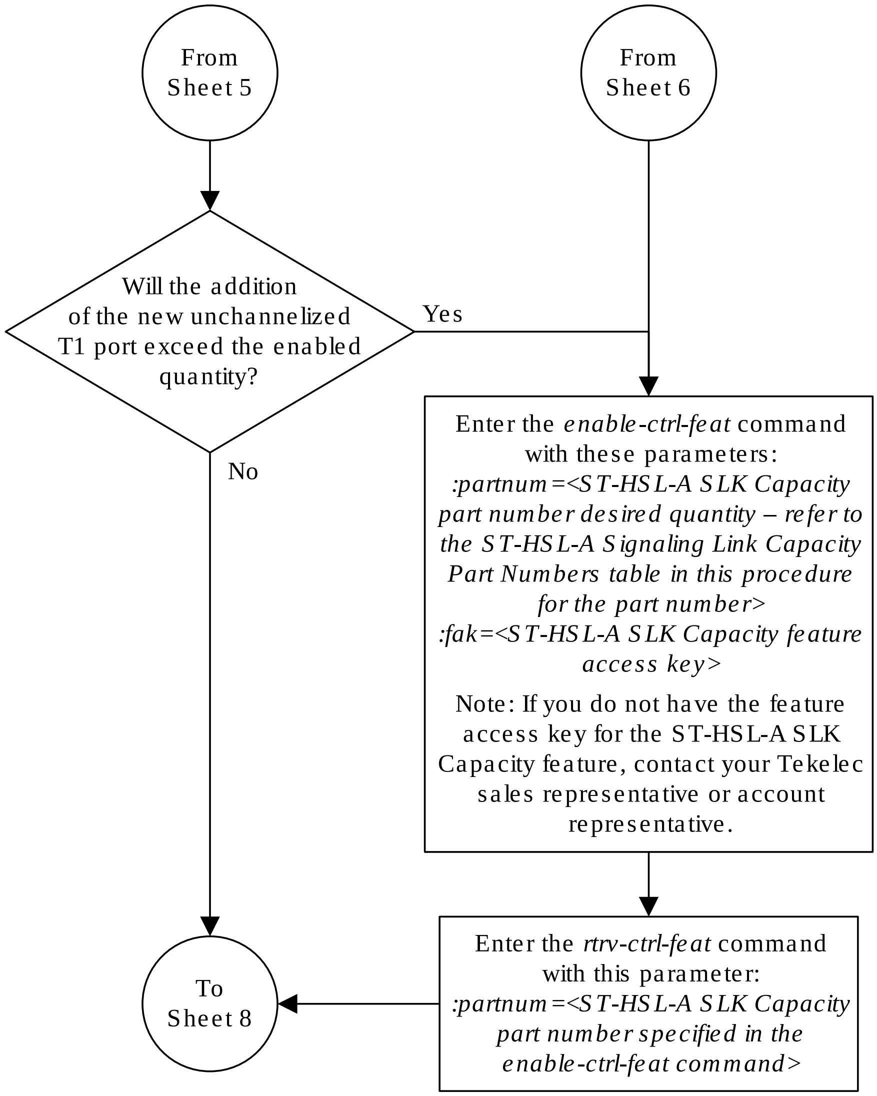
Sheet 4 of 9


From Sheets 1, 2, 3, or 4
Enter the rtrv-ctrl-feat command
Notes:
1. If the rtrv-ctrl-feat output shows no other features, only the default entry HC-MIM SLK Capacity feature with a quantity of 64 is shown.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).
Is an ST-HSL-A SLK quantity enabled?
Yes
To Sheet 7
No
Are any controlled features shown in the rtrv-ctrl-feat output? (See Note 1)
No
Enter the rtrv-serial-num command
Yes
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
Yes
To Sheet 7
No
To Sheet 6

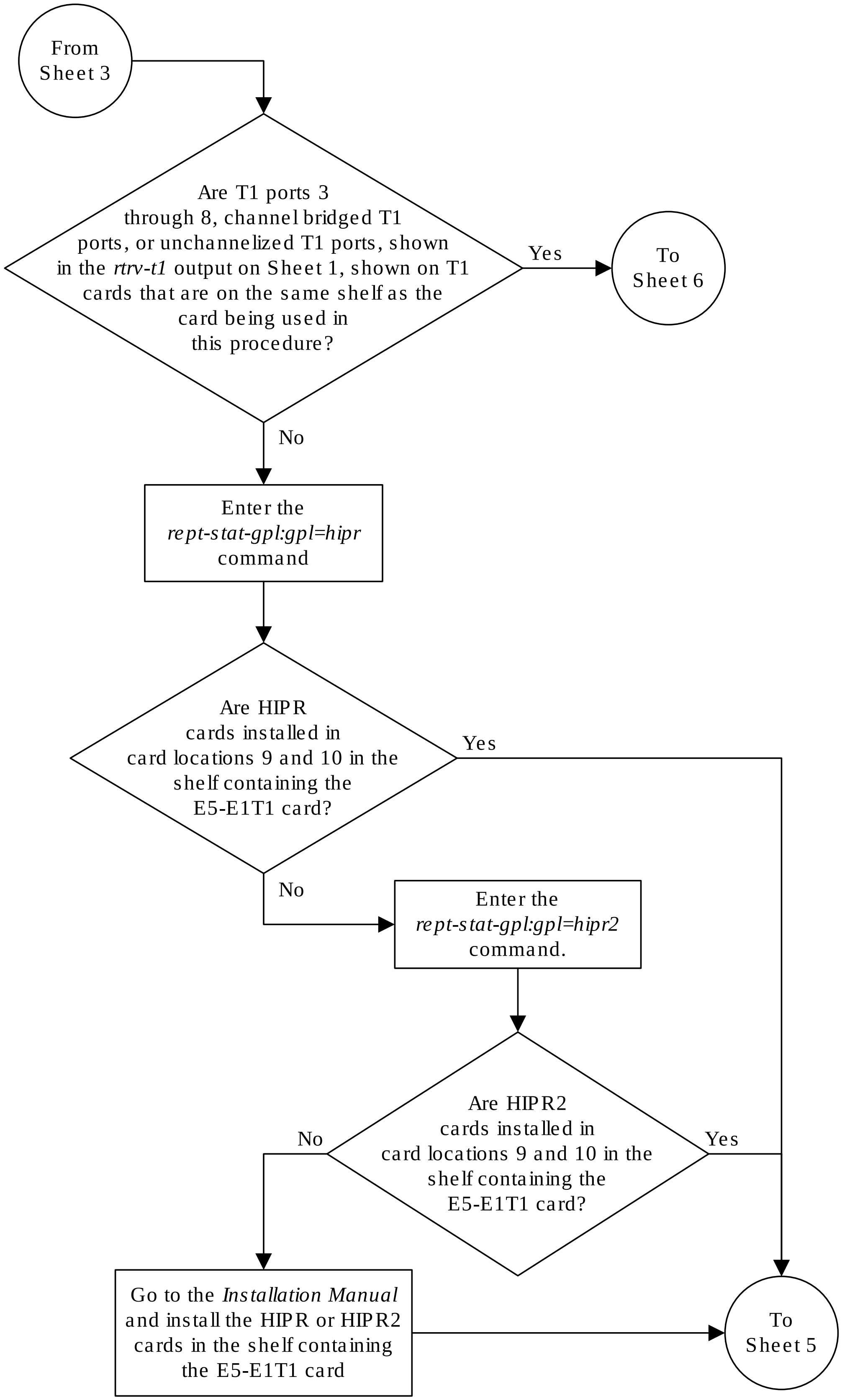
Sheet 5 of 9


From Sheet 5
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
No
Is the EAGLE 5 ISS's serial number locked?
Yes
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
No
Enter the *ent-serial-num* command with this parameter: *:serial=<EAGLE 5 ISS's correct serial number>*
Enter the *rtrv-serial-num* command
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the *ent-serial-num* command with these parameters: *:serial=<EAGLE 5 ISS's serial number>* *:lock=yes*
To Sheet 7

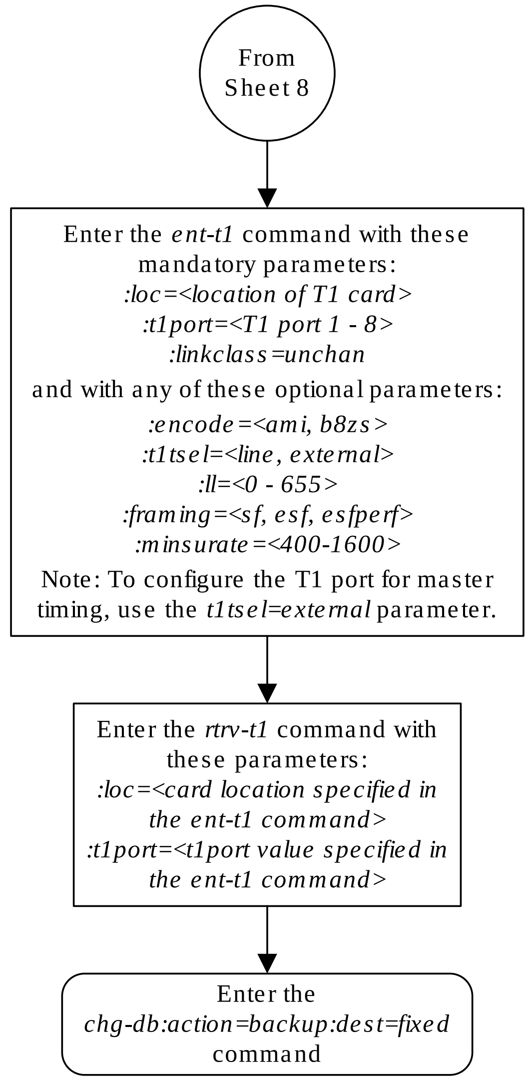
Sheet 6 of 9


From Sheet 5
From Sheet 6
Will the addition of the new unchannelized T1 port exceed the enabled quantity?
Yes
No
Enter the enable-ctrl-feat command with these parameters:
:partnum=<ST-HSL-A SLK Capacity part number desired quantity – refer to the ST-HSL-A Signaling Link Capacity Part Numbers table in this procedure for the part number>
:fak=<ST-HSL-A SLK Capacity feature access key>
Note: If you do not have the feature access key for the ST-HSL-A SLK Capacity feature, contact your Tekelec sales representative or account representative.
Enter the rtrv-ctrl-feat command with this parameter:
:partnum=<ST-HSL-A SLK Capacity part number specified in the enable-ctrl-feat command>
To Sheet 8

Sheet 7 of 9


From Sheet 3
Are T1 ports 3 through 8, channel bridged T1 ports, or unchannelized T1 ports, shown in the rtrv-t1 output on Sheet 1, shown on T1 cards that are on the same shelf as the card being used in this procedure?
Yes
To Sheet 6
No
Enter the rept-stat-gpl:gpl=hipr command
Are HIPR cards installed in card locations 9 and 10 in the shelf containing the E5-E1T1 card?
Yes
No
Enter the rept-stat-gpl:gpl=hipr2 command.
Are HIPR2 cards installed in card locations 9 and 10 in the shelf containing the E5-E1T1 card?
No
Yes
Go to the Installation Manual and install the HIPR or HIPR2 cards in the shelf containing the E5-E1T1 card
To Sheet 5

Sheet 8 of 9


From Sheet 8
Enter the *ent-t1* command with these mandatory parameters:
:loc=<location of T1 card>
:t1port=<T1 port 1 - 8>
:linkclass=unchan
and with any of these optional parameters:
:encode=<ami, b8zs>
:t1tsel=<line, external>
:ll=<0 - 655>
:framing=<sf, esf, esfperf>
:minsurate=<400-1600>
Note: To configure the T1 port for master timing, use the *t1tsel=external* parameter.
Enter the *rtrv-t1* command with these parameters:
:loc=<card location specified in the ent-t1 command>
:t1port=<t1port value specified in the ent-t1 command>
Enter the *chg-db:action=backup:dest=fixed* command

Sheet 9 of 9

B.9 Removing the T1 Interface Parameters

This procedure is used to remove a **T1** interface from the database using the `dlt-t1` command using these parameters.

`:loc` – The location of the **T1** card (card type `limt1`) containing the **T1** interface being removed.

`:t1port` – The **T1** port on the **T1** card containing the **T1** interface being removed.

The **T1** interface to be removed must exist in the database. This can be verified in step 1.

To remove the **T1** interface information contained on a **T1** card, all signaling links serviced by that **T1** card must be removed from the database. This can be verified with the `rtrv-t1` command, specifying the card location and `t1port` value on the **T1** card, and the `rtrv-slk` command, specifying the location of any cards (**T1** or channel cards) shown in the `rtrv-t1` output. If there are any signaling links being serviced by the **T1** card, go to the Removing an SS7 Signaling Link procedure and remove these signaling links.

Even numbered **T1** ports cannot be removed if the even numbered **T1** port is channel bridged. Remove the corresponding odd numbered **T1** port (see Table B-5) to remove the even numbered channel bridged **T1** port.

1. Display the existing **T1** interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                 LINK     MINSU
LOC   PORT   ENCODE   T1TSEL     FRAMING  LL   CHANBRDG  CLASS    RATE
1207  1      AMI      EXTERNAL   ESF      50   -----     CHAN     ----
1215  2      B8ZS     LINE       SF       100  -----     CHAN     ----
```

   If the **T1** port being removed is an even numbered **T1** port and is channel bridged, select the corresponding odd numbered **T1** port to remove (see Table B-5) and go to step 2.

   If the even numbered **T1** port is not channel bridged, it can be removed with the `dlt-t1` command. go to step 2.

2. Display the timeslots that are serviced by the **T1** card containing the **T1** interface information to be removed using the `rtrv-t1` command specifying the card location and the `t1port` value from step 1. For this example, enter this command.

   `rtrv-t1:loc=1207:t1port=1`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                 LINK     MINSU
```

```
LOC    PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1103   1     B8ZS    LINE      SF       133  ------    CHAN    ----

TS1  -------    TS9  -------    TS17 1208,A2
TS2  1207,A     TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
TS5  -------    TS13 -------    TS21 -------
TS6  1208,A     TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

If this step shows any timeslots that are serviced by the **T1** card, go to the Removing an SS7 Signaling Link procedure and remove the timeslots and signaling links serviced by the **T1** card.

3. Remove the **T1** interface information to the database using the `dlt-t1` command specifying the card location of the **T1** card and the **T1** port on that card. For this example, enter these commands.

   `dlt-t1:loc=1207:t1port=1`

4. Verify the changes using the `rtrv-t1` command with the card location and the `t1port` value specified in 3 .

   For this example, enter this command.

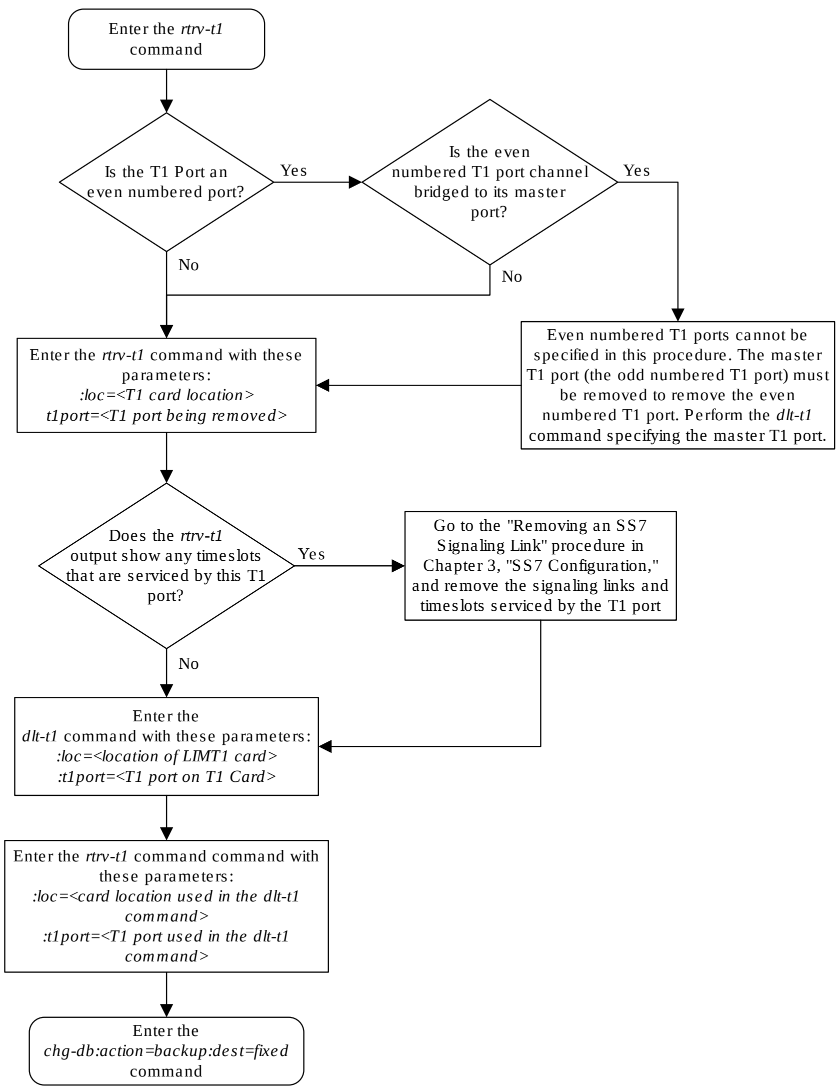
   `rtrv-t1:loc=1207:t1port=1`

```
rlghncxa03w 10-04-19 21:17:04 GMT EAGLE5 42.0.0
E2737 Cmd Rej: The T1PORT at the specified location is not equipped
```

5. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure B-9 Removing the T1 Interface Parameters



B.10 Changing the Attributes of a Channelized T1 Port

This procedure is used to change the attributes of a channelized **T1** port using the `chg-t1` command. A channelized T1 port is a T1 port whose `LINKCLASS` value is `CHAN`, shown in the `LINKCLASS` column in the `rtrv-t1` output. Other actions can be performed on T1 ports. To perform these actions on the T1 ports, perform one of these procedures.

- To change the attributes of an unchannelized T1 port - Changing the Attributes of an Unchannelized T1 Port
- To make a channel bridged T1 port from a channelized T1 port - Making a Channel Bridged T1 Port from a Channelized T1 Port
- To make a non-channel bridged T1 port from a channel bridged T1 port - Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port

To change the attributes of a channelized T1 port, these parameters are used with the `chg-t1` command.

`:loc` – The location of the T1 card (card type `limt1`) that contains the T1 port that is being changed. The location of a channel card (card type `limch`) cannot be specified for this parameter. The T1 card can be either an **E1/T1 MIM**, an **HC-MIM**, or an **E5-E1T1** card.

`:t1port` – The T1 port being changed in this procedure.

`:encode` – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**.

`:t1tsel` – The timing source for the T1 signaling link, master (`external`), slave (`line`), or `recovered`.

The `recovered` timing source can be used only with the `chanbrdg=on` parameter and uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:framing` – Specifies the framing format to be used on the T1 signaling link, either `sf` or `esf`.

`:ll` – The length of the cable, in feet, used for the T1 signaling link. The value of the `ll` parameter is from 0 to 655.

The T1 card specified in this procedure must be in the database. This can be verified with the `rtrv-t1` command.

If either the `encode`, `t1tsel`, `framing`, or `ll` values are being changed, all the signaling links serviced by the T1 card must be taken out of service.

1. Display the existing **T1** interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                LINK     MINS
LOC   PORT   ENCODE   T1TSEL    FRAMING  LL   CHANBRDG  CLASS    RATE
1201  2      B8ZS     EXTERNAL  SF       133  ------    CHAN     ----
```

```
1203  2     B8ZS    LINE      SF        133  ------   CHAN    ----
1211  2     B8ZS    LINE      SF        133  ------   CHAN    ----
```

A channelized T1 port is a T1 port whose `LINKCLASS` value is `CHAN`.

If there are no channelized T1 ports shown in the `rtrv-t1` output, this procedure cannot be performed.

If there are channelized T1 ports shown in the `rtrv-t1` output, continue the procedure with 2.

> **Note:**
>
> At least one of the optional parameters `encode`, `t1tsel`, `framing`, or `ll` must be specified. If none of these parameters are specified with the `chg-t1` command, this procedure cannot be performed.

2. Display the timeslots that are serviced by the T1 card containing the T1 port that is being changed using the `rtrv-t1` command specifying the card location and the `t1port` value from 1.

   For this example, enter this command.

   `rtrv-t1:loc=1201:t1port=2`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                               LINK    MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1201  2     B8ZS    EXTERNAL  SF       133  ------    CHAN    ----

TS1  1201,A     TS9  -------    TS17 -------
TS2  -------    TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
TS5  1202,A     TS13 -------    TS21 -------
TS6  -------    TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

3. Display the signaling links that are assigned to the T1 card by entering the `rtrv-slk` command with the card location specified in 2. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T               PCR  PCR
T1   T1
LOC  LINK LSN        SLC TYPE      SET  BPS    ECM   N1   N2
LOC  PORT TS
1201 A    lsn1        13 LIMT1     1    56000  BASIC ---  -----
1201 2    10
```

```
1201 B    lsn1         12 LIMT1    1    56000  BASIC ---   ----- 1201 1
9
```

4. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=a`

   ```
   rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
   SLK      LSN        CLLI         PST            SST        AST
   1201,A  lsn1       ----------- IS-NR         Avail      ----
     ALARM STATUS       = No Alarms
     UNAVAIL REASON     = --
     T1 status          = 1201, RCVRY-T1F:FAC-T1 Port 2 available
   ```

   `rept-stat-slk:loc=1201:link=b`

   ```
   rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
   SLK      LSN        CLLI         PST            SST        AST
   1201,B  lsn1       ----------- IS-NR         Avail      ----
     ALARM STATUS       = No Alarms
     UNAVAIL REASON     = --
     T1 status          = 1201, RCVRY-T1F:FAC-T1 Port 1 available
   ```

   If all the signaling links shown in this step are out of service, continue the procedure by performing one of these steps.

   - If the T1 port is channel bridged (the entry `MASTER` is shown in the `CHANBRDG` column for the odd numbered T1 port in the `rtrv-t1` output), or if T1 ports 3 through 8 are assigned to the T1 card, the card is either an HC MIM or an E5-E1T1 card. Continue the procedure with 7.
   - If the T1 port is not channel bridged, or if T1 ports 3 through 8 are not assigned to the T1 card, continue the procedure with 6 to verify the type of T1 card that the T1 port is assigned to.

   If any of the signaling links shown in this step are in service, continue the procedure with 5.

5. Deactivate the signaling links shown in 4 using the `dact-slk` command.

   For this example, enter these commands.

   `dact-slk:loc=1201:link=a`

   `dact-slk:loc=1201:link=b`

   When each of these commands have successfully completed, this message should appear.

   ```
   rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
   Deactivate Link message sent to card
   ```

After the signaling links have been deactivated, continue the procedure by performing one of these steps.

- If the T1 port is channel bridged (the entry `MASTER` is shown in the `CHANBRDG` column for the odd numbered T1 port in the `rtrv-t1` output), or if T1 ports 3 through 8 are assigned to the T1 card, the card is either an HC-MIM or an E5-E1T1 card. Continue the procedure with 7.
- If the T1 port is not channel bridged, or if T1 ports 3 through 8 are not assigned to the T1 card, continue the procedure with 6 to verify the type of T1 card that the T1 port is assigned to.

6. Display the LIMT1 cards in the database by entering this command.

   `rtrv-stp:type=limt1`

```
rlghncxa03w 09-05-30 11:07:17 EST  EAGLE 41.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL
GPL Version
----  -----------  ---  -------------  ----     --    ----
-----------

1201  870-2671-02  C    10145689323    LIMT1    512M  SS7ANSI
126-034-000
1203  870-1873-01  C    10345690569    LIMT1    512M  SS7ANSI
126-034-000
1211  870-1873-01  C    10346790570    LIMT1    512M  SS7ANSI
126-034-000

Command Completed.
```

   The part numbers and the card types of the T1 cards are shown in Table B-4.

7. Change the T1 port using the `chg-t1` command and the parameter combinations shown in Table B-13, based on the type of T1 card being used.

Table B-13 T1 Interface Parameter Combinations

E1/T1MIM	Non-Channel Bridged T1 Ports - HC-MIM or E5-E1T1 Card	Channel Bridged T1 Ports - HC-MIM or E5-E1T1 Card
	Mandatory Parameters	
:loc=location of the **T1** card	:loc=location of the **T1** card	:loc=location of the **T1** card
:t1port=**T1** port being changed, either 1 or 2	:t1port=**T1** port being changed, either 1, 2, 3, 4, 5, 6, 7, or 8	:t1port=**T1** port being changed, either 1, 3, 5, or 7
	Optional Parameters	
:encode=ami, b8zs	:encode=ami, b8zs	:encode=ami, b8zs
:t1tsel=line, external	:t1tsel=line, external	:t1tsel=external, recovered
:framing=sf, esf	:framing=sf, esf	:framing=sf, esf
:ll=0 - 655	:ll=0 - 655	:ll=0 - 655

For this example, enter this command.

```
chg-
t1:loc=1201:t1port=2:encode=ami:encode=line:framing=esf:ll=200
```

8. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 7.

   For this example, enter these commands.

   ```
   rtrv-t1:loc=1201:t1port=2
   ```

   ```
   rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

         T1                                            LINK    MINS
   LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
   1201  2     AMI     LINE      ESF      200  ------    CHAN    ----

   TS1  1201,A     TS9  -------    TS17 -------
   TS2  -------    TS10 -------    TS18 -------
   TS3  -------    TS11 -------    TS19 -------
   TS4  -------    TS12 -------    TS20 -------
   TS5  1202,A     TS13 -------    TS21 -------
   TS6  -------    TS14 -------    TS22 -------
   TS7  -------    TS15 -------    TS23 -------
   TS8  -------    TS16 -------    TS24 -------
   ```

   If the signaling links were not deactivated in 5, continue the procedure with 10.

   If the signaling links were deactivated in 5, continue the procedure with 9.

9. Activate the signaling links that were deactivated in 5 using the `act-slk` command.

   For this example, enter these commands.

   ```
   act-slk:loc=1201:link=a
   ```

   ```
   act-slk:loc=1201:link=b
   ```

   When each of these commands have successfully completed, this message should appear.

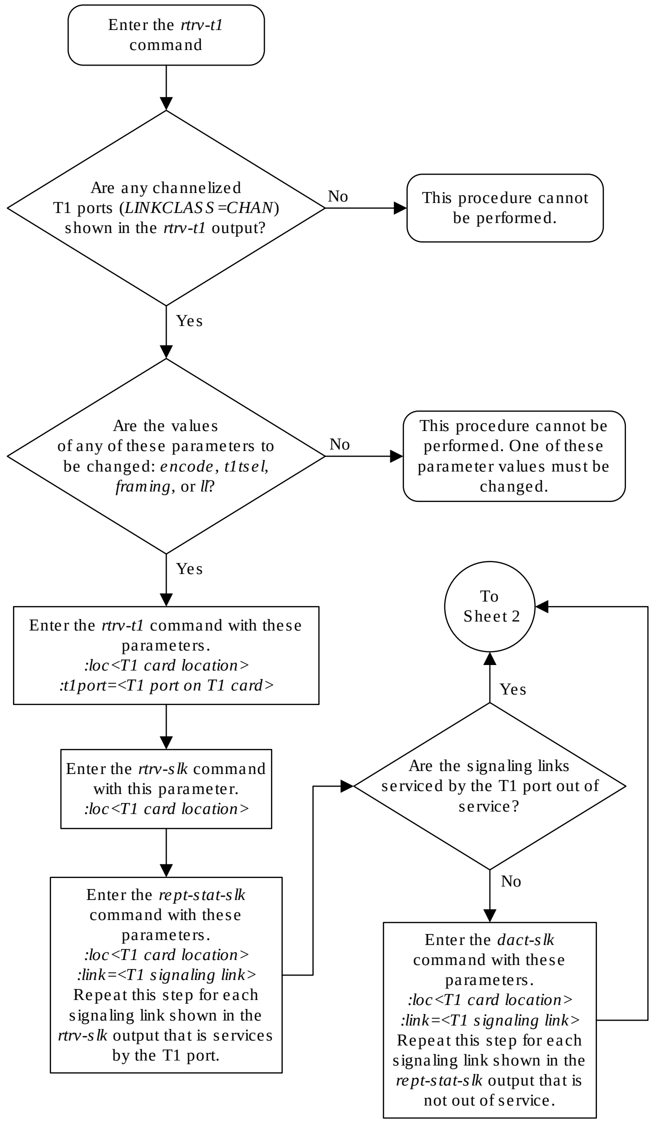
   ```
   rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
   Activate Link message sent to card
   ```

10. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

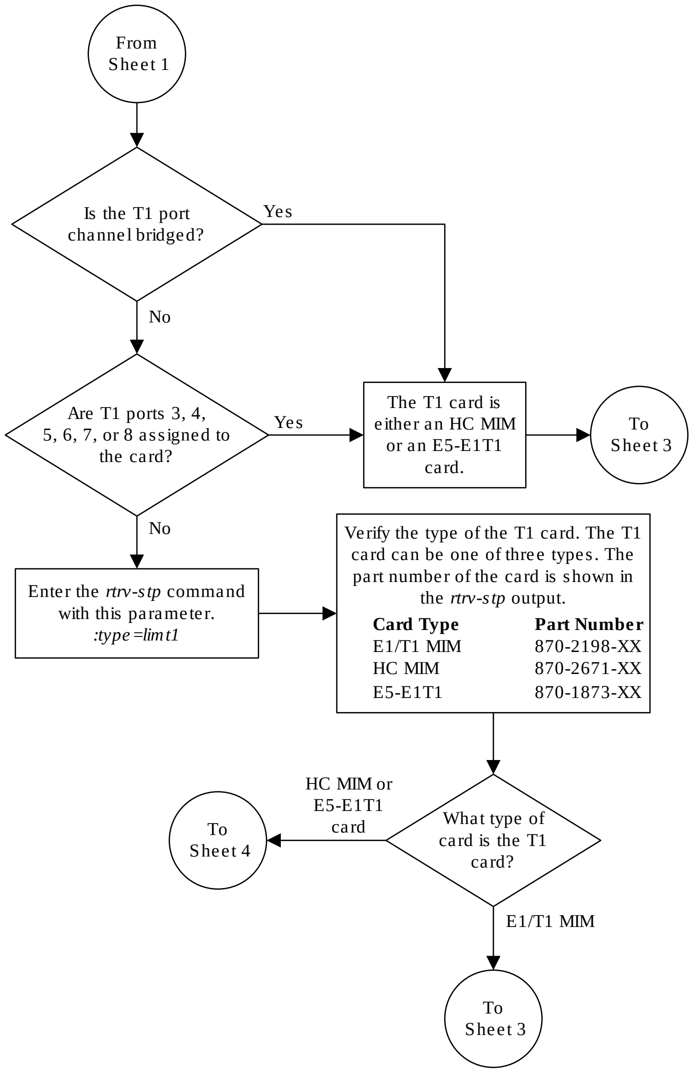
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

    ```
    BACKUP (FIXED) : MASP A - Backup starts on active MASP.
    BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
    BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
    BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
    ```

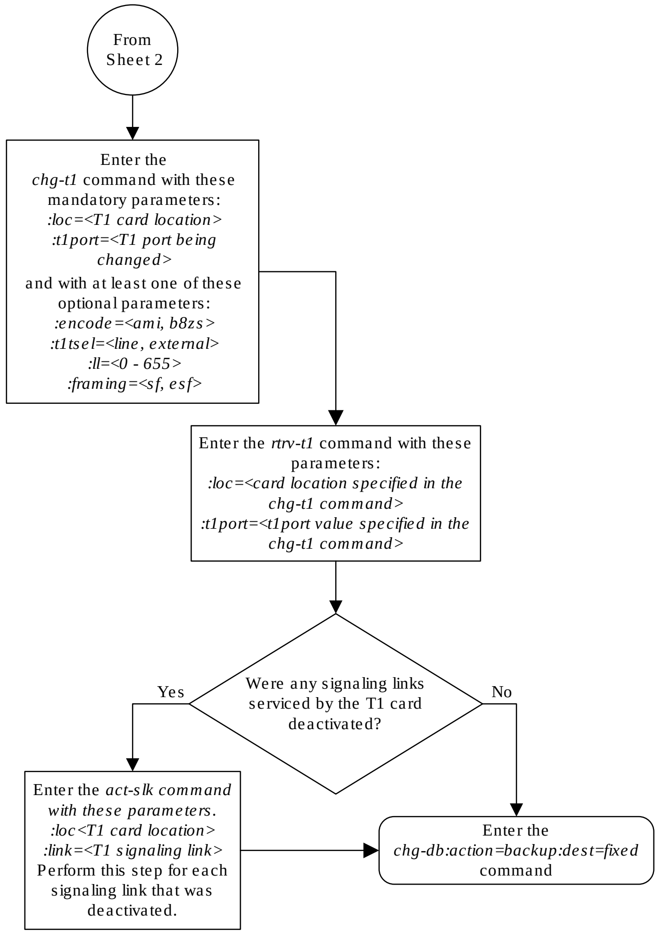
Figure B-10 Changing the Attributes of a Channelized T1 Port



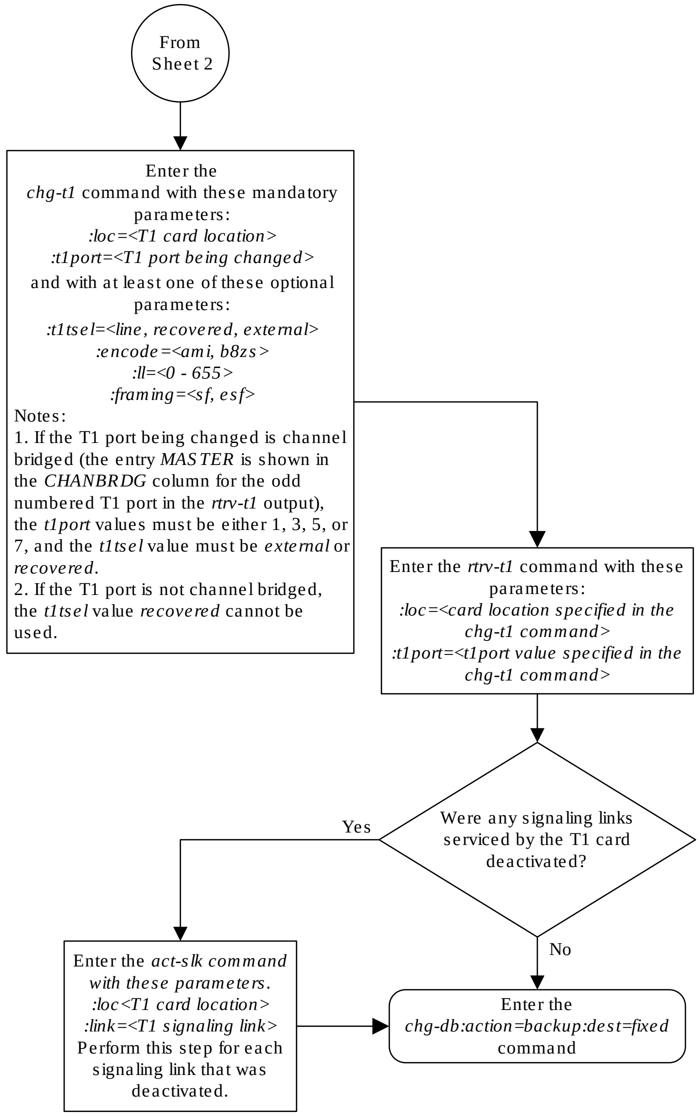
Sheet 1 of 4


From Sheet 1
Is the T1 port channel bridged?
Yes
No
Are T1 ports 3, 4, 5, 6, 7, or 8 assigned to the card?
Yes
The T1 card is either an HC MIM or an E5-E1T1 card.
To Sheet 3
No
Enter the rtrv-stp command with this parameter. :type=limt1
Verify the type of the T1 card. The T1 card can be one of three types. The part number of the card is shown in the rtrv-stp output.
Card Type Part Number
E1/T1 MIM 870-2198-XX
HC MIM 870-2671-XX
E5-E1T1 870-1873-XX
What type of card is the T1 card?
HC MIM or E5-E1T1 card
To Sheet 4
E1/T1 MIM
To Sheet 3

Sheet 2 of 4


From Sheet 2
Enter the chg-t1 command with these mandatory parameters: :loc=<T1 card location> :t1port=<T1 port being changed> and with at least one of these optional parameters: :encode=<ami, b8zs> :t1tsel=<line, external> :ll=<0 - 655> :framing=<sf, esf>
Enter the rtrv-t1 command with these parameters: :loc=<card location specified in the chg-t1 command> :t1port=<t1port value specified in the chg-t1 command>
Were any signaling links serviced by the T1 card deactivated?
Yes
No
Enter the act-slk command with these parameters. :loc<T1 card location> :link=<T1 signaling link> Perform this step for each signaling link that was deactivated.
Enter the chg-db:action=backup:dest=fixed command

Sheet 3 of 4



Sheet 4 of 4

B.11 Changing the Attributes of an Unchannelized T1 Port

This procedure is used to change the attributes of an unchannelized **T1** port using the `chg-t1` command. An unchannelized T1 port is an T1 port whose `LINKCLASS` value is `UNCHAN`, shown in the `LINKCLASS` column in the `rtrv-t1` output. Other actions can be performed on T1 ports. To perform these actions on the T1 ports, perform one of these procedures.

- To change the attributes of a channelized T1 port - Changing the Attributes of a Channelized T1 Port
- To make a channel bridged T1 port from a channelized T1 port - Making a Channel Bridged T1 Port from a Channelized T1 Port
- To make a non-channel bridged T1 port from a channel bridged T1 port - Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port

To change the attributes of an unchannelized T1 port, these parameters are used with the `chg-t1` command.

`:loc` – The location of the T1 card (card type `limt1`) that is servicing the T1 signaling link. The location of a channel card (card type `limch`) cannot be specified for this parameter. The T1 card can be either an HC-MIM or an E5-E1T1 card.

`:t1port` – The T1 port being changed in this procedure.

`:encode` – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**.

`:t1tsel` – The timing source for the T1 signaling link, master (`external`) or slave (`line`).

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

`:framing` – Specifies the framing format to be used on the T1 signaling link, either `sf`, `esf`, or `esfperf`.

`:ll` – The length of the cable, in feet, used for the T1 signaling link. The value of the `ll` parameter is from 0 to 655.

`:minsurate` – Specifies the minimum number of signaling units (**FISUs** and **LSSUs**) per second that are transmitted on the outbound T1 signaling link during idle periods or when there is an unused portion of the link's bandwidth. The value of this parameter is from 400 to 1600 signaling units per second, with the default value of 1000 signaling units per second. The `minsurate` parameter can be specified only for un unchannelized T1 port (`linkclass=unchan` parameter).

The **T1** card specified in this procedure must be in the database. This can be verified with the `rtrv-t1` command.

If either the `encode`, `t1tsel`, `framing`, or `ll` values are being changed, all the signaling links serviced by the T1 card must be taken out of service.

1. Display the existing T1 interfaces in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
```

```
      T1                                                LINK    MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1201  2     B8ZS    EXTERNAL  SF       133  ------    UNCHAN  1200
1203  2     B8ZS    LINE      SF       133  ------    CHAN    ----
1211  2     B8ZS    LINE      SF       133  ------    CHAN    ----
```

An unchannelized T1 port is an T1 port whose `LINKCLASS` value is `UNCHAN`.

If there are no unchannelized T1 ports shown in the `rtrv-t1` output, this procedure cannot be performed.

If there are unchannelized T1 ports shown in the `rtrv-t1` output, continue the procedure by performing one of these steps.

- If the `encode`, `t1tsel`, `framing`, or `ll` parameters are being changed in this procedure, continue the procedure with 2.
- If the `encode`, `t1tsel`, `framing`, or `ll` parameters are not being changed in this procedure, continue the procedure with 5.

2. Display the signaling links that are assigned to the T1 card by entering the `rtrv-slk` command with the card location shown in 1. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

                                  L2T             PCR  PCR   E1   E1
LOC  LINK LSN          SLC TYPE   SET  BPS     ECM   N1   N2    LOC  PORT
TS
1201 A    lsn1          13 LIMT1  1    56000  BASIC ---  ----- 1201 2
10
```

3. Check the status of the signaling links shown in 2 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=a`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,A   lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  T1 status          = 1201, RCVRY-T1F:FAC-T1 Port 2 available
```

   If all the signaling links shown in this step are out of service, continue the procedure with 5.

   If any of the signaling links shown in this step are in service, continue the procedure with 4.

4. Deactivate the signaling links shown in 3 using the `dact-slk` command.

   For this example, enter these commands.

```
dact-slk:loc=1201:link=a
```

When this command has successfully completed, this message should appear.

```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Deactivate Link message sent to card
```

5. Change the T1 port using the `chg-t1` command and the parameter combinations shown in Table B-14.

Table B-14   Unchannelized T1 Port Parameter Combinations

Mandatory Parameters
:loc=location of the T1 card
:t1port=T1 port being changed, either 1, 2, 3, 4, 5, 6, 7, or 8
Optional Parameters
:encode=ami, b8zs
:t1tsel=line, external
:framing=sf, esf, esfperf
:ll=0 - 655
:minsurate=400 - 1600

For this example, enter this command.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                 LINK    MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1201  2     B8ZS    EXTERNAL  SF       133  ------    UNCHAN  1200
1203  2     B8ZS    LINE      SF       133  ------    CHAN    ----
1211  2     B8ZS    LINE      SF       133  ------    CHAN    ----
```

```
chg-
t1:loc=1201:t1port=2:encode=ami:t1tsel=line:framing=esfperf:
ll=300:minsurate=700
```

6. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 5.

For this example, enter these commands.

```
rtrv-t1:loc=1201:t1port=2
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                 LINK    MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS   RATE
1201  2     AMI     LINE      ESF PERF 300  ------    UNCHAN  700
```

If the signaling links were not deactivated in 4, continue the procedure with 8.

If the signaling links were deactivated in 4, continue the procedure with 7.

7. Activate the signaling links that were deactivated in 4 using the `act-slk` command.

   For this example, enter this command.

   `act-slk:loc=1201:link=a`

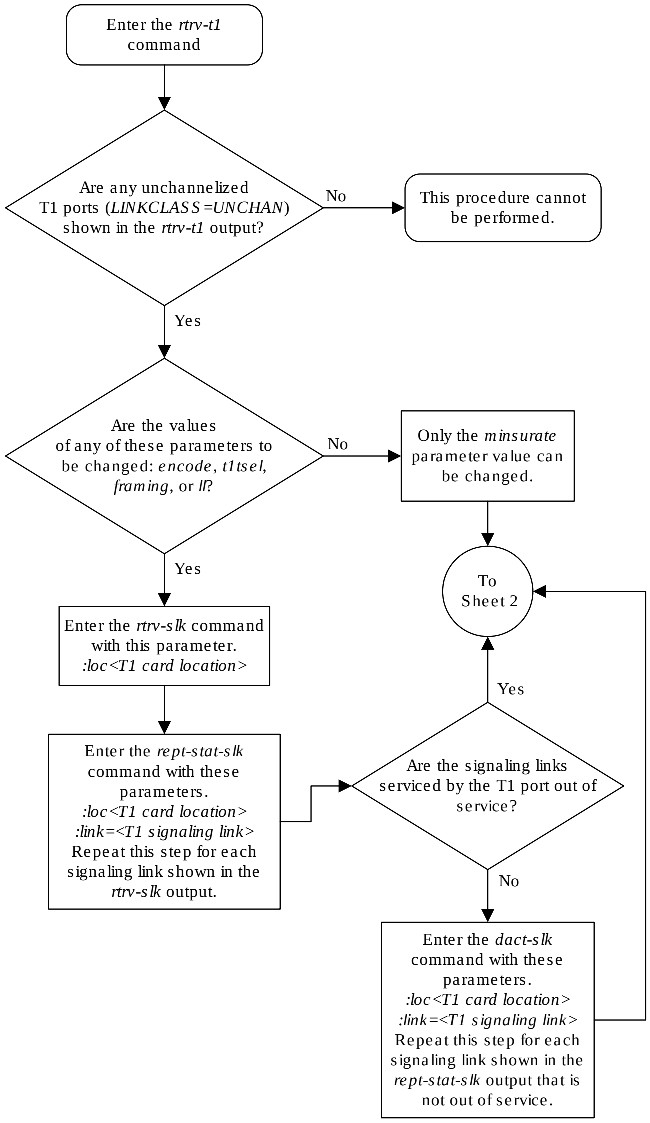
```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Activate Link message sent to card
```

8. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

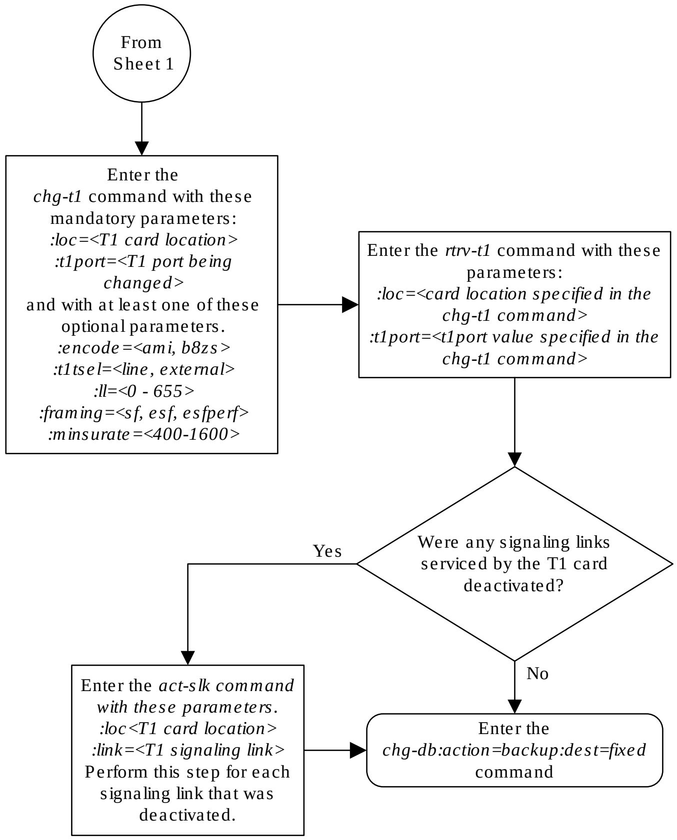
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure B-11 Changing the Attributes of an Unchannelized T1 Port



Sheet 1 of 2



Sheet 2 of 2

B.12 Making a Channel Bridged T1 Port from a Channelized T1 Port

This procedure is used to make a channel bridged T1 port from a channelized T1 port that is not channel bridged using the `chg-t1` command. A channelized T1 port is a T1 port whose

LINKCLASS value is CHAN, shown in the LINKCLASS column in the rtrv-t1 output. A non-channel bridged T1 port is an odd numbered T1 port that contains dashes in the CHANBRDG column in the rtrv-t1 output. Other actions can be performed on T1 ports. To perform these actions on the T1 ports, perform one of these procedures.

- To change the attributes of a channelized T1 port - Changing the Attributes of a Channelized T1 Port
- To change the attributes of an unchannelized T1 port - Changing the Attributes of an Unchannelized T1 Port
- To make a non-channel bridged T1 port from a channel bridged T1 port - Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port

To make a channel bridged T1 port from a channelized T1 port, these parameters are used with the chg-t1 command.

:loc – The location of the T1 card (card type limt1) that contains the odd numbered channelized T1 port. The location of a channel card (card type limch) cannot be specified for this parameter. The T1 card can be either an **HC-MIM** or an **E5-E1T1** card.

:t1port – The T1 port being changed in this procedure. Only the odd numbered T1 ports, 1, 3, 5, or 7, can be specified for a channel bridged T1 port.

:encode – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**.

:t1tsel – The timing source for the T1 signaling link, master (external) or recovered.

The recovered timing source can be used only with the chanbrdg=on parameter and uses the even numbered member of the bridged-pair as a clock source, ensuring that port in the pair can recover the timing from its partner.

> **Note:**
>
> To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

:framing – Specifies the framing format to be used on the TI signaling link, either sf or esf. The default value is sf (framing=sf).

:ll – The length of the cable, in feet, used for the T1 signaling link. The value of the ll parameter is from 0 to 655.

:chanbrdg – Specifies whether or not the odd numbered T1 port specified in this procedure is channel bridged to its adjacent even numbered T1 port. Table B-15 shows the T1 ports that can be specified with the chanbrdg=on parameter and the even-numbered T1 ports that are bridged to the odd numbered T1 port.

Table B-15 Channel Bridging Ports

Odd Numbered T1 Port	Even Numbered Bridged T1 Port
1	2
3	4
5	6
7	8

`:force=yes` – required when the even numbered **T1** port being channel bridged is provisioned in the database before this procedure is performed.

The T1 card specified in this procedure must be in the database. This can be verified with the `rtrv-t1` command.

If either the `encode`, `t1tsel`, `framing`, or `ll` values are being changed, all the signaling links serviced by the T1 card must be taken out of service.

1. Display the existing T1 ports in the database using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                  LINK     MINS
LOC   PORT  ENCODE  T1TSEL     FRAMING  LL   CHANBRDG  CLASS    RATE
1201  1     B8ZS    EXTERNAL   SF       133  ------    CHAN     ----
1201  2     B8ZS    EXTERNAL   SF       133  ------    CHAN     ----
1203  2     B8ZS    LINE       SF       133  ------    CHAN     ----
1211  2     B8ZS    LINE       SF       133  ------    CHAN     ----
```

   A channelized T1 port is an T1 port whose `LINKCLASS` value is `CHAN`.

   If there are no odd numbered channelized T1 ports that are not channel bridged shown in the `rtrv-t1` output, this procedure cannot be performed.

   If odd numbered channelized T1 ports that are not channel bridged are shown in the `rtrv-t1` output, continue the procedure by performing one of these steps.

   - If the T1 card contains channel bridged T1 ports, or contains T1 ports 3 through 8, continue the procedure with by performing one of these steps.
     – If the `encode`, `t1tsel`, `framing`, or `ll` parameters are not being changed in this procedure, continue the procedure by performing one of these steps.
       * If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure by performing one of these steps.
         * If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
         * If the adjacent T1 port is not provisioned, continue the procedure with 12.

        * If T1 cards are not shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 7.
        * If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 7.
    - If the `encode`, `t1tsel`, `framing`, or `ll` parameters are being changed in this procedure, continue the procedure with 3.
- If the T1 card does not contain channel bridged T1 ports, or does not contain T1 ports 3 through 8, continue the procedure with 2.

2. Display the LIMT1 cards in the database by entering this command.

```
rtrv-stp:type=limt1


rlghncxa03w 09-05-30 11:07:17 EST  EAGLE 41.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL
GPL Version
----  -----------  ---  -------------  ----     --    ----
-----------

1201  870-2671-02  C    10145689323    LIMT1    512M  SS7ANSI
126-034-000
1203  870-1873-01  C    10345690569    LIMT1    512M  SS7ANSI
126-034-000
1211  870-1873-01  C    10346790570    LIMT1    512M  SS7ANSI
126-034-000

Command Completed.
```

   The part numbers and the card types of the T1 cards are shown in Table B-4.

   If the T1 card is an E1/T1 MIM, this card cannot be used in this procedure, Choose another T1 port on another HC-MIM or E5-E1t1 card and repeat this procedure from 1. If no HC-MIMs or E5-E1T1 cards are present in the EAGLE, this procedure cannot be performed.

   If the T1 card is either an HC-MIM card or an E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the `encode`, `t1tsel`, `framing`, or `ll` parameters are not being changed in this procedure, continue the procedure by performing one of these steps.
       - If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure by performing one of these steps.
           * If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.

        * If the adjacent T1 port is not provisioned, continue the procedure with 12.
    – If T1 cards are not shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, continue the procedure with 7.
    – If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 7.
- If the `encode`, `t1tsel`, `framing`, or `ll` parameters are being changed in this procedure, continue the procedure with 3.

3. Display the timeslots that are serviced by the T1 card containing the T1 port being changed using the `rtrv-t1` command specifying the card location and the `t1port` value from 1.

   For this example, enter this command.

   `rtrv-t1:loc=1201:t1port=1`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                  LINK     MINS
LOC   PORT   ENCODE   T1TSEL     FRAMING   LL    CHANBRDG  CLASS    RATE
1201  1      B8ZS     EXTERNAL   SF        133   ------    CHAN     ----

TS1  1201,A     TS9  -------    TS17 -------
TS2  -------    TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
TS5  1202,A     TS13 -------    TS21 -------
TS6  -------    TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

4. Display the signaling links that are assigned to the T1 card by entering the `rtrv-slk` command with the card location specified in 3. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                    L2T               PCR  PCR    E1   E1
LOC  LINK LSN          SLC TYPE     SET  BPS     ECM   N1   N2     LOC  PORT
TS
1201 A    lsn1          13 LIMT1     1    56000   BASIC ---  ----- 1201 2
25
1201 B    lsn1          12 LIMT1     1    56000   BASIC ---  ----- 1201 1
20
```

5. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

```
rept-stat-slk:loc=1201:link=a


rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN        CLLI        PST           SST        AST
1201,A   lsn1       ----------- IS-NR         Avail      ----
  ALARM STATUS        = No Alarms
  UNAVAIL REASON      = --
  T1 status           = 1201, RCVRY-T1F:FAC-T1 Port 2 available
```

```
rept-stat-slk:loc=1201:link=b


rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN        CLLI        PST           SST        AST
1201,B   lsn1       ----------- IS-NR         Avail      ----
  ALARM STATUS        = No Alarms
  UNAVAIL REASON      = --
  T1 status           = 1201, RCVRY-T1F:FAC-T1 Port 1 available
```

If all the signaling links shown in this step are out of service, continue the procedure by performing one of these steps.

- If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure by performing one of these steps.
  - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
  - If the adjacent T1 port is not provisioned, continue the procedure with 12.
- If T1 cards are not shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 7.
- If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 7.

If any of the signaling links shown in this step are in service, continue the procedure with 6.

6. Deactivate the signaling links shown in 5 using the `dact-slk` command.

   For this example, enter these commands.

   `dact-slk:loc=1201:link=a`

   `dact-slk:loc=1201:link=b`

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Deactivate Link message sent to card
```

Continue the procedure by performing one of these steps.

- If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards have T1 ports 3 through 8 provisioned, contain channel bridged T1 ports, or unchannelized T1 ports, continue the procedure by performing one of these steps.
  - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
  - If the adjacent T1 port is not provisioned, continue the procedure with 12.
- If T1 cards are not shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that will contain the T1 port that is being added, continue the procedure with 7.
- If T1 cards are shown in the `rtrv-t1` output in 1 that are on the same shelf as the card that contains the T1 port that is being changed, and these cards do not have T1 ports 3 through 8 provisioned, do not contain channel bridged T1 ports, or do not have unchannelized T1 ports, continue the procedure with 7.

7. Verify that **HIPR2** cards are installed in card locations 9 and 10 in the shelf containing the HC MIM or E5-E1T1 card that will contain the T1 port being changed in this procedure by entering this command.

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL         CARD       RUNNING            APPROVED      TRIAL
HIPR2       1109       126-002-000        126-002-000   126-003-000
HIPR2       1110       126-002-000        126-002-000   126-003-000
HIPR2       1209       126-002-000        126-002-000   126-003-000
HIPR2       1210       126-002-000        126-002-000   126-003-000
HIPR2       1309       126-002-000        126-002-000   126-003-000
HIPR2       1310       126-002-000        126-002-000   126-003-000
HIPR2       2109       126-002-000        126-002-000   126-003-000
HIPR2       2110       126-002-000        126-002-000   126-003-000
Command Completed
```

   If HIPR2 cards are installed in the shelf containing the HC-MIM or E5-E1T1 card, continue the procedure by performing one of these steps.

   - If the card is an E5-E1T1 card, continue the procedure by performing one of these steps.
     - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
     - If the adjacent T1 port is not provisioned, continue the procedure with 12.

- If the card is an HC-MIM, continue the procedure with 8.

If HIPR2 cards are not installed on the shelf containing the HC-MIM or E5-E1T1 card, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure by performing one of these steps.

- If the card is an E5-E1T1 card, continue the procedure by performing one of these steps.
  - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
  - If the adjacent T1 port is not provisioned, continue the procedure with 12.
- If the card is an HC-MIM, continue the procedure with 8.

8. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

   Note:

   The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure by performing one of these steps.

   - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
   - If the adjacent T1 port is not provisioned, continue the procedure with 12.

   If the Fan feature is off, continue the procedure with Oracle.

9. Turn the Fan feature on by entering this command.

   `chg-feat:fan=on`

   Note:

   Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
   The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Sales Representative or Account Representative.

   When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 09-05-28 11:43:04 GMT EAGLE5 41.0.0
CHG-FEAT: MASP A - COMPLTD
```

10. The shelf containing the HC-MIM being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

    If the fans are not installed on the shelf containing the HC-MIM, go to *Installation Guide* and install the fans.

    After the fans have been installed and tested, or if the fans were already installed. continue the procedure by performing one of these steps.

    - If the adjacent T1 port is provisioned (see Table B-15), continue the procedure with 11.
    - If the adjacent T1 port is not provisioned, continue the procedure with 12.

11. Display the **T1** signaling links in the database by entering this command.

    ```
    rtrv-slk:class=t1
    ```

    ```
    rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                       L2T                PCR  PCR   T1   T1
    LOC  LINK LSN          SLC TYPE    SET  BPS    ECM    N1   N2    LOC  PORT
    TS
    1201 A    lsn1          13 LIMT1   1    56000  BASIC ---  ----- 1201 2
    25
    1201 B    lsn1          12 LIMT1   1    56000  BASIC ---  ----- 1201 1
    20
    1202 A    lsn1          0  LIMCH   1    56000  BASIC ---  ----- 1201 1
    5
    1202 B    lsn1          8  LIMCH   1    56000  BASIC ---  ----- 1201 1
    1
    1203 A1   lsn1          4  LIMT1   1    56000  BASIC ---  ----- 1203 2
    20
    1203 B1   lsn1          9  LIMT1   1    56000  BASIC ---  ----- 1203 1
    2
    1204 A2   lsn1          5  LIMCH   1    56000  BASIC ---  ----- 1203 1
    21
    1204 A3   lsn1          6  LIMCH   1    56000  BASIC ---  ----- 1203 1
    22
    1211 A    lsn1          14 LIMT1   1    56000  BASIC ---  ----- 1211 1
    7
    1212 A    lsn1          10 LIMCH   1    56000  BASIC ---  ----- 1211 1
    28
    1212 B    lsn1          11 LIMCH   1    56000  BASIC ---  ----- 1211 1
    25
    1213 A4   lsn1          1  LIMT1   1    56000  BASIC ---  ----- 1213 1
    17
    1213 A5   lsn1          7  LIMT1   1    56000  BASIC ---  ----- 1213 5
    23
    1213 B5   lsn1          2  LIMT1   1    56000  BASIC ---  ----- 1213 1
    24
    1213 A6   lsn1          3  LIMT1   1    56000  BASIC ---  ----- 1213 5
    19
    ```

    If an even numbered **T1** port is to be channel bridged, and that **T1** port is assigned to signaling links, these signaling links must be removed before the **T1** port can be channel bridged. Perform Removing an SS7 Signaling Link to remove these signaling links. After the signaling links have been removed, continue the procedure with 12.

If the even numbered **T1** port to be channel bridged is not assigned to signaling links, continue the procedure with 12.

12. Change the T1 port using the `chg-t1` command and the parameter combinations shown in Table B-16.

Table B-16 Channel Bridged T1 Port Parameter Combinations

Mandatory Parameters
:loc=location of the T1 card
:t1port=T1 port being changed, either 1, 3, 5, or 7
:chanbrdg=on
Optional Parameters
:encode=ami, b8zs
:t1tsel=external, recovered (See Note 1)
:framing=sf, esf
:ll=0 - 655
:force=yes (See Note 2)
Notes:
1. The `t1tsel` value must be either `external` or `recovered`. If the current `t1tsel` parameter value is `line`, the `t1tsel`parameter value for the T1 port being channel bridged must be changed.
2. The `force=yes` parameter must be used when the even numbered port being channel bridged is shown in the `rtrv-t1` output in 1. If the even numbered port being channel bridged is not shown in the `rtrv-t1` output in 1, the `force=yes` parameter cannot be used.

For this example, enter this command.

```
chg-
t1:loc=1201:t1port=1:encode=ami:t1tsel=recovered:framing=esf
:ll=300:chanbrdg=on
```

13. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 12.

For this example, enter this command.

```
rtrv-t1:loc=1201:t1port=1
```

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                           LINK    MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING LL   CHANBRDG CLASS   RATE
1201  1     AMI     RECOVERED ESF     300  MASTER   CHAN    ----

TS1  1201,A     TS9  -------    TS17 -------
TS2  -------    TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
```

```
TS5  1202,A     TS13 -------    TS21 -------
TS6  -------    TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

If the signaling links were not deactivated in 6, continue the procedure with 15.

If the signaling links were deactivated in 6, continue the procedure with 14.

14. Activate the signaling links that were deactivated in 6 using the `act-slk` command.

    For this example, enter these commands.

    `act-slk:loc=1201:link=a`

    `act-slk:loc=1201:link=b`

    When each of these commands have successfully completed, this message should appear.

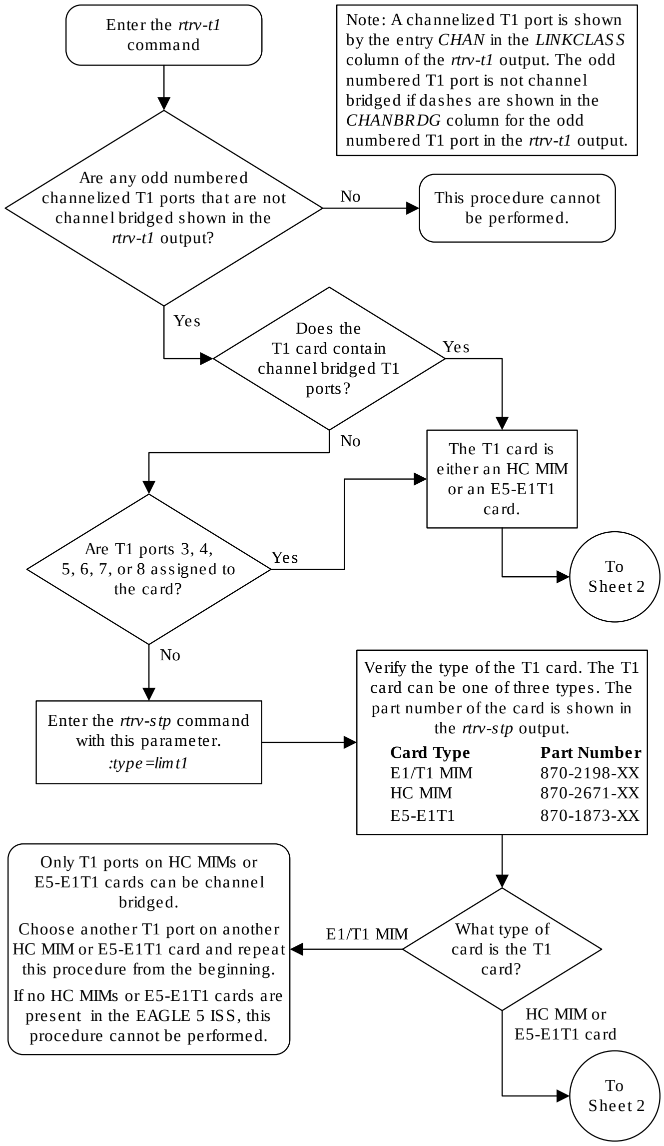
    ```
    rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
    Activate Link message sent to card
    ```

15. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

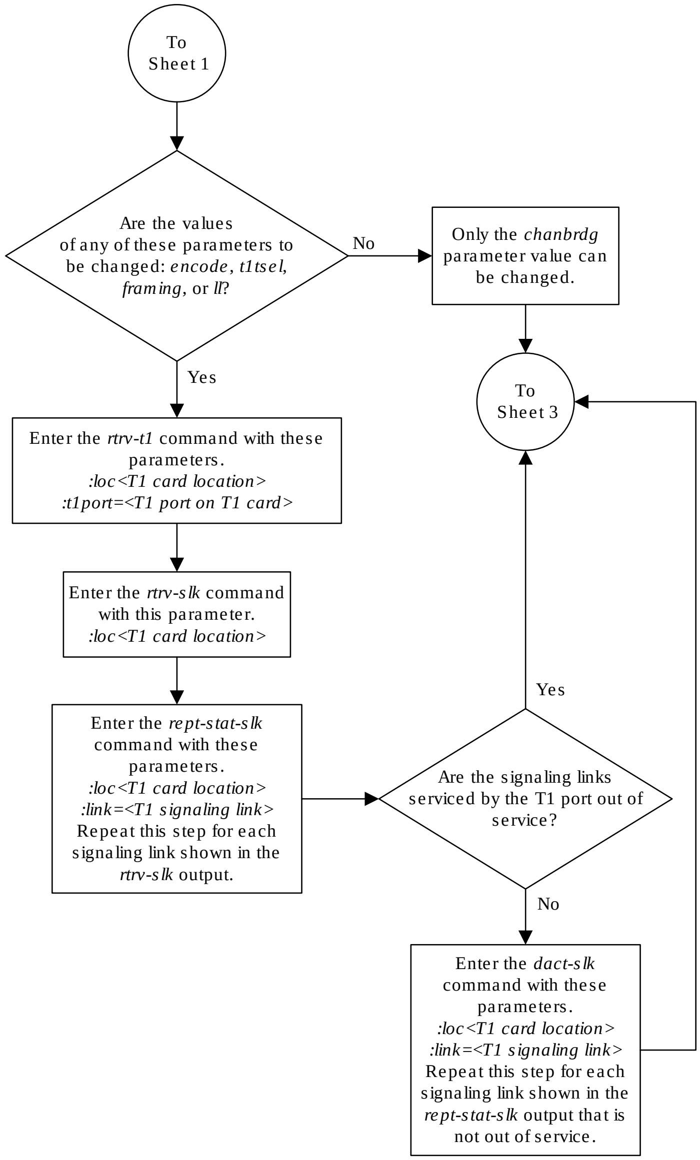
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

    ```
    BACKUP (FIXED) : MASP A - Backup starts on active MASP.
    BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
    BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
    BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
    ```

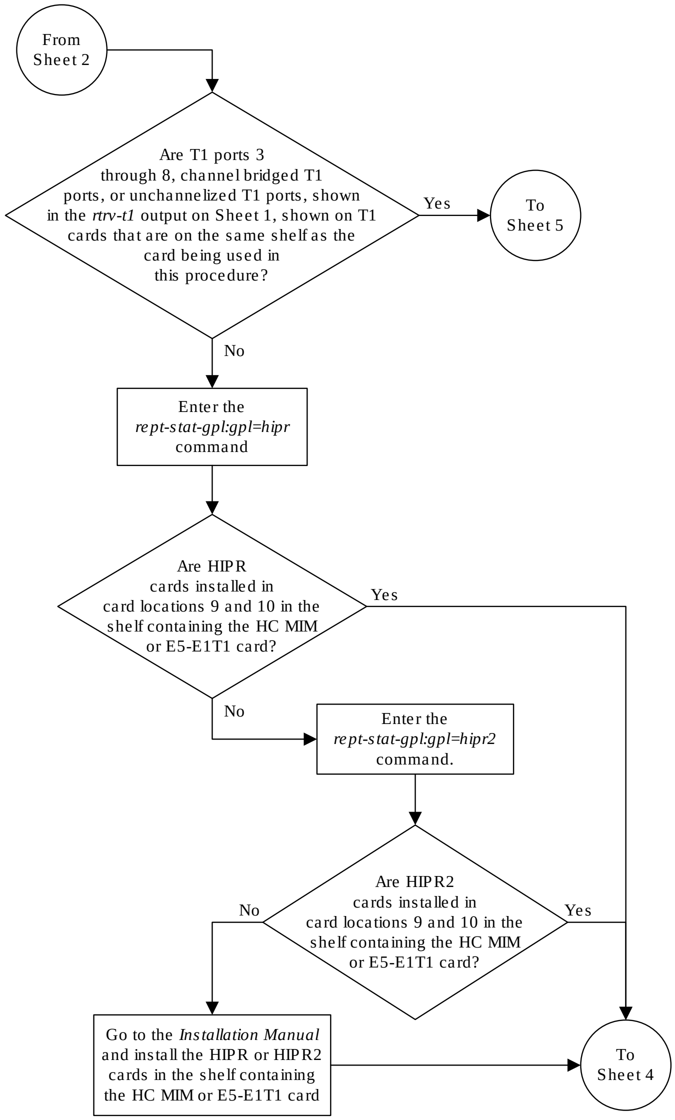
Figure B-12   Making a Channel Bridged T1 Port from a Channelized T1 Port



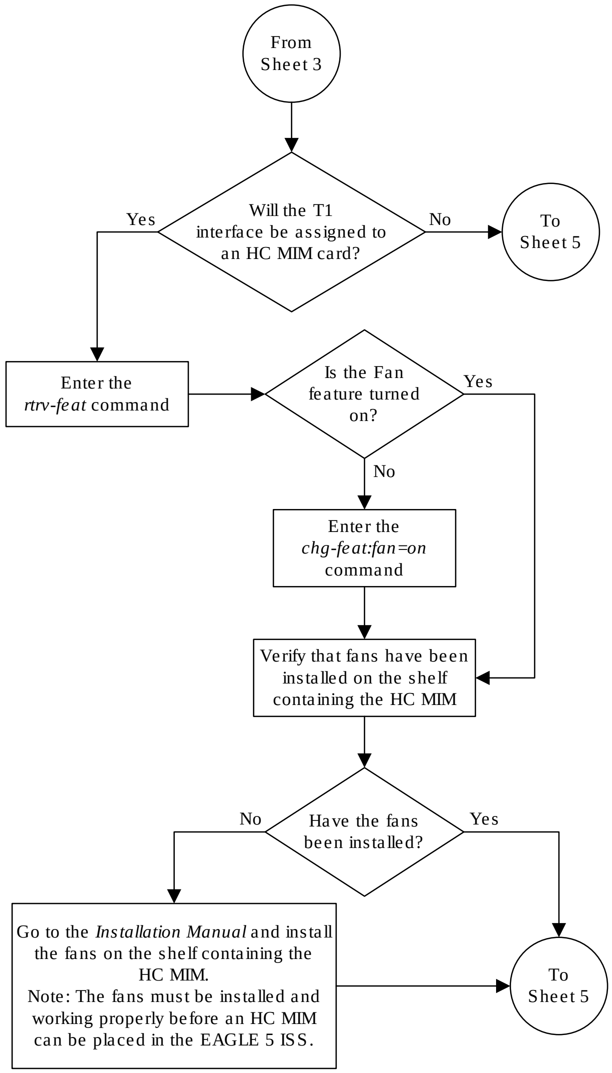
Sheet 1 of 6


To Sheet 1
Are the values of any of these parameters to be changed: encode, t1tsel, framing, or ll?
No
Only the chanbrdg parameter value can be changed.
To Sheet 3
Yes
Enter the rtrv-t1 command with these parameters.
:loc<T1 card location>
:t1port=<T1 port on T1 card>
Enter the rtrv-slk command with this parameter.
:loc<T1 card location>
Enter the rept-stat-slk command with these parameters.
:loc<T1 card location>
:link=<T1 signaling link>
Repeat this step for each signaling link shown in the rtrv-slk output.
Yes
Are the signaling links serviced by the T1 port out of service?
No
Enter the dact-slk command with these parameters.
:loc<T1 card location>
:link=<T1 signaling link>
Repeat this step for each signaling link shown in the rept-stat-slk output that is not out of service.

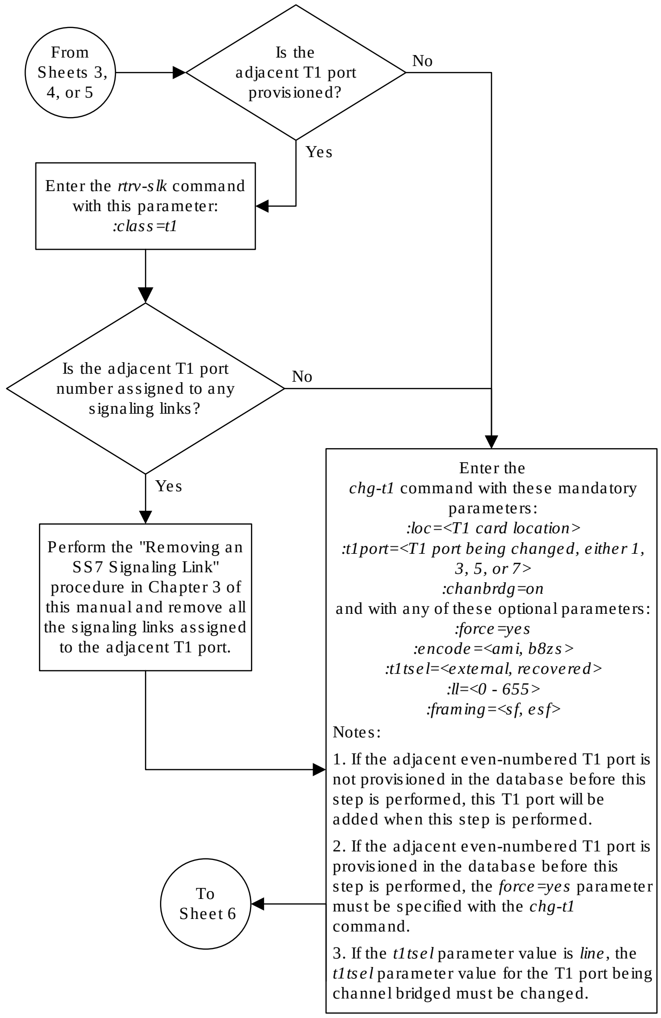
Sheet 2 of 6


From
Sheet 2
Are T1 ports 3
through 8, channel bridged T1
ports, or unchannelized T1 ports, shown
in the *rtrv-t1* output on Sheet 1, shown on T1
cards that are on the same shelf as the
card being used in
this procedure?
Yes
To
Sheet 5
No
Enter the
rept-stat-gpl:gpl=hipr
command
Are HIPR
cards installed in
card locations 9 and 10 in the
shelf containing the HC MIM
or E5-E1T1 card?
Yes
No
Enter the
rept-stat-gpl:gpl=hipr2
command.
Are HIPR2
cards installed in
card locations 9 and 10 in the
shelf containing the HC MIM
or E5-E1T1 card?
No
Yes
Go to the *Installation Manual*
and install the HIPR or HIPR2
cards in the shelf containing
the HC MIM or E5-E1T1 card
To
Sheet 4

Sheet 3 of 6


From Sheet 3
Will the T1 interface be assigned to an HC MIM card?
Yes
No
To Sheet 5
Enter the *rtrv-feat* command
Is the Fan feature turned on?
Yes
No
Enter the *chg-feat:fan=on* command
Verify that fans have been installed on the shelf containing the HC MIM
Have the fans been installed?
No
Yes
Go to the *Installation Manual* and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 5

Sheet 4 of 6


From Sheets 3, 4, or 5
Is the adjacent T1 port provisioned?
No
Yes
Enter the *rtrv-slk* command with this parameter:
:class=t1
Is the adjacent T1 port number assigned to any signaling links?
No
Yes
Perform the "Removing an SS7 Signaling Link" procedure in Chapter 3 of this manual and remove all the signaling links assigned to the adjacent T1 port.
Enter the *chg-t1* command with these mandatory parameters:
:loc=<T1 card location>
:t1port=<T1 port being changed, either 1, 3, 5, or 7>
:chanbrdg=on
and with any of these optional parameters:
:force=yes
:encode=<ami, b8zs>
:t1tsel=<external, recovered>
:ll=<0 - 655>
:framing=<sf, esf>
Notes:
1. If the adjacent even-numbered T1 port is not provisioned in the database before this step is performed, this T1 port will be added when this step is performed.
2. If the adjacent even-numbered T1 port is provisioned in the database before this step is performed, the *force=yes* parameter must be specified with the *chg-t1* command.
3. If the *t1tsel* parameter value is *line*, the *t1tsel* parameter value for the T1 port being channel bridged must be changed.
To Sheet 6

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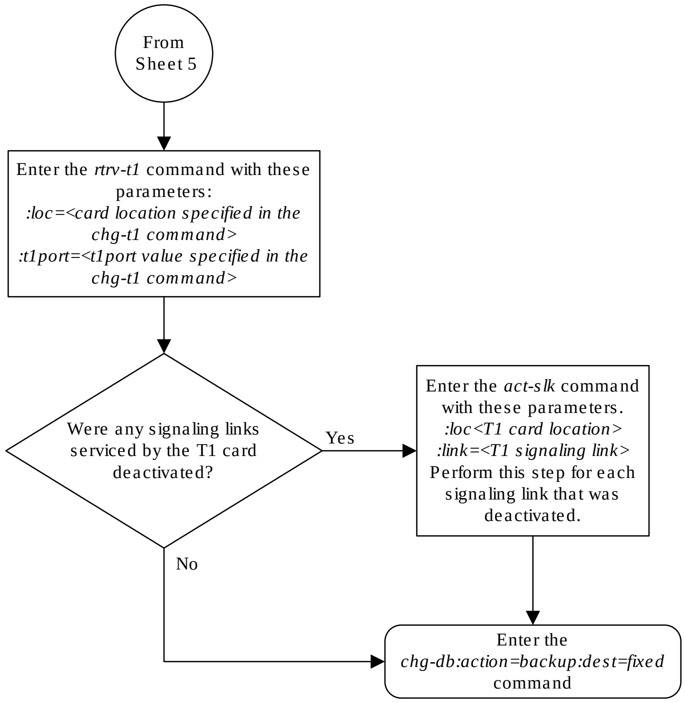

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B.13 Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port

This procedure is used to make a non-channel bridged **T1** port from a channel bridged T1 port using the `chg-t1` command. A channel bridged T1 port is an odd numbered T1 port that contains the entry MASTER in the CHANBRDG column in the rtrv-t1 output. Other actions can be performed on T1 ports. To perform these actions on the T1 ports, perform one of these procedures.

- To change the attributes of a channelized T1 port - Changing the Attributes of a Channelized T1 Port
- To change the attributes of an unchannelized T1 port - Changing the Attributes of an Unchannelized T1 Port
- To make a channel bridged T1 port from a channelized T1 port that is not channel bridged - Making a Channel Bridged T1 Port from a Channelized T1 Port

To make a non-channel bridged T1 port from a channel bridged T1 port, these parameters are used with the chg-t1 command.

:loc – The location of the T1 card (card type limt1) that contains the channel bridged T1 port. The location of a channel card (card type limch) cannot be specified for this parameter. The T1 card can be either an **HC-MIM** or an **E5-E1T1** card.

:t1port – The T1 port being changed in this procedure. Only the odd numbered T1 ports, 1, 3, 5, or 7, can be specified for a channel bridged T1 port.

:encode – Specifies the type of encoding or decoding that is used on the T1 signaling link, either **B8ZS** or **AMI**.

:t1tsel – The timing source for the T1 signaling link, master (external) or slave (line). If the t1tsel value for the channel bridged T1 port is recovered, the t1tsel value must be changed to either line or external when the channel bridged T1 port is changed to a non-channel bridged T1 port.

Note:

To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the **TDM** Global Timing Interface options must be configured. For more information, see Configuring the Options for the TDM Global Timing Interface.

:chanbrdg=off – Specifies that the odd numbered T1 port specified in this procedure is not channel bridged to its adjacent even numbered T1 port.

The **T1** card specified in this procedure must be in the database. This can be verified with the rtrv-t1 command.

If either the encode, t1tsel, framing, or ll values are being changed, all the signaling links serviced by the T1 card must be taken out of service.

1. Display the existing T1 interfaces in the database using the rtrv-t1 command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

        T1                                                  LINK    MINS
LOC     PORT   ENCODE   T1TSEL      FRAMING   LL     CHANBRDG   CLASS   RATE
```

```
1201  1     B8ZS    EXTERNAL  SF       133  MASTER    CHAN     ----
1201  2     B8ZS    EXTERNAL  SF       133  SLAVE     CHAN     ----
1203  2     B8ZS    LINE      SF       133  ------    CHAN     ----
1211  2     B8ZS    LINE      SF       133  ------    CHAN     ----
```

A channel bridged T1 port is an odd numbered T1 port that contains the entry `MASTER` in the `CHANBRDG` column in the `rtrv-t1` output.

If there are no channel bridged T1 ports shown in the `rtrv-t1` output, this procedure cannot be performed.

If channel bridged T1 ports shown in the `rtrv-t1` output, continue the procedure by performing one of these steps.

- If the `encode`, `t1tsel`, `framing`, or `ll` parameters are not being changed in this procedure, continue the procedure with 6.
- If the `encode`, `t1tsel`, `framing`, or `ll` parameters are being changed in this procedure, continue the procedure with 2.

2. Display the timeslots that are serviced by the **T1** card containing the **T1** interface information to be changed using the `rtrv-t1` command specifying the card location and the `t1port` value from 1.

   For this example, enter this command.

   `rtrv-t1:loc=1201:t1port=1`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                LINK     MINS
LOC   PORT  ENCODE  T1TSEL    FRAMING  LL   CHANBRDG  CLASS    RATE
1201  1     B8ZS    EXTERNAL  SF       133  MASTER    CHAN     ----

TS1  1201,A     TS9  -------    TS17 -------
TS2  -------    TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
TS5  1202,A     TS13 -------    TS21 -------
TS6  -------    TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

3. Display the signaling links that are assigned to the T1 card by entering the `rtrv-slk` command with the card location specified in 2. For this example, enter this command.

   `rtrv-slk:loc=1201`

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0
                                   L2T                 PCR  PCR    E1   E1
LOC   LINK LSN          SLC TYPE   SET  BPS     ECM    N1   N2     LOC  PORT
TS
1201 B    lsn1          12 LIMT1    1    56000  BASIC ---   ----- 1201 1
10
```

4. Check the status of the signaling links shown in 3 using the `rept-stat-slk` command with the card location and signaling link.

   For this example, enter these commands.

   `rept-stat-slk:loc=1201:link=b`

```
rlghncxa03w 09-05-23 13:06:25 GMT EAGLE5 41.0.0
SLK      LSN       CLLI        PST          SST       AST
1201,B   lsn1      ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  T1 status          = 1201, RCVRY-T1F:FAC-T1 Port 1 available
```

   If all the signaling links shown in this step are out of service, continue the procedure with 6.

   If any of the signaling links shown in this step are in service, continue the procedure with 5.

5. Deactivate the signaling links shown in 4 using the `dact-slk` command.

   For this example, enter these commands.

   `dact-slk:loc=1201:link=b`

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Deactivate Link message sent to card
```

6. Change the T1 port using the `chg-t1` command and the parameter combinations shown in Table B-17.

Table B-17 Non-Channel Bridged T1 Port Parameter Combinations

Mandatory Parameters
:loc=location of the T1 card
:t1port=T1 port being changed, either 1, 3, 5, or 7
:chanbrdg=off
Optional Parameters
:encode=ami, b8zs
:framing=sf, esf
:ll=0 - 655
:t1tsel=line, external. If the current `t1tsel` value is `recovered`, the `t1tsel` value must be changed to either `line` or `external`.

   For this example, enter this command.

```
chg-
t1:loc=1201:t1port=1:encode=ami:framing=esf:ll=500:t1tsel=li
ne:chanbrdg=off
```

> **Note:**
>
> When the `chanbrdg=off` parameter is specified with the `chg-t1` command, the even numbered T1 port that was channel bridged to the T1 port specified in this step is removed from the database.

7. Verify the changes using the `rtrv-t1` command specifying the card location and the `t1port` value specified in 6.

   For this example, enter these commands.

   `rtrv-t1:loc=1201:t1port=1`

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0

      T1                                                  LINK    MINS
LOC   PORT  ENCODE  T1TSEL     FRAMING  LL   CHANBRDG  CLASS   RATE
1201  1     AMI     LINE       ESF      500  ------    CHAN    ----

TS1  1201,A     TS9  -------    TS17 -------
TS2  -------    TS10 -------    TS18 -------
TS3  -------    TS11 -------    TS19 -------
TS4  -------    TS12 -------    TS20 -------
TS5  1202,A     TS13 -------    TS21 -------
TS6  -------    TS14 -------    TS22 -------
TS7  -------    TS15 -------    TS23 -------
TS8  -------    TS16 -------    TS24 -------
```

   If the signaling links were not deactivated in 5, continue the procedure with 9.

   If the signaling links were deactivated in 5, continue the procedure with 8.

8. Activate the signaling links that were deactivated in 5 using the `act-slk` command.

   For this example, enter these commands.

   `act-slk:loc=1201:link=b`

   When this command has successfully completed, this message should appear.

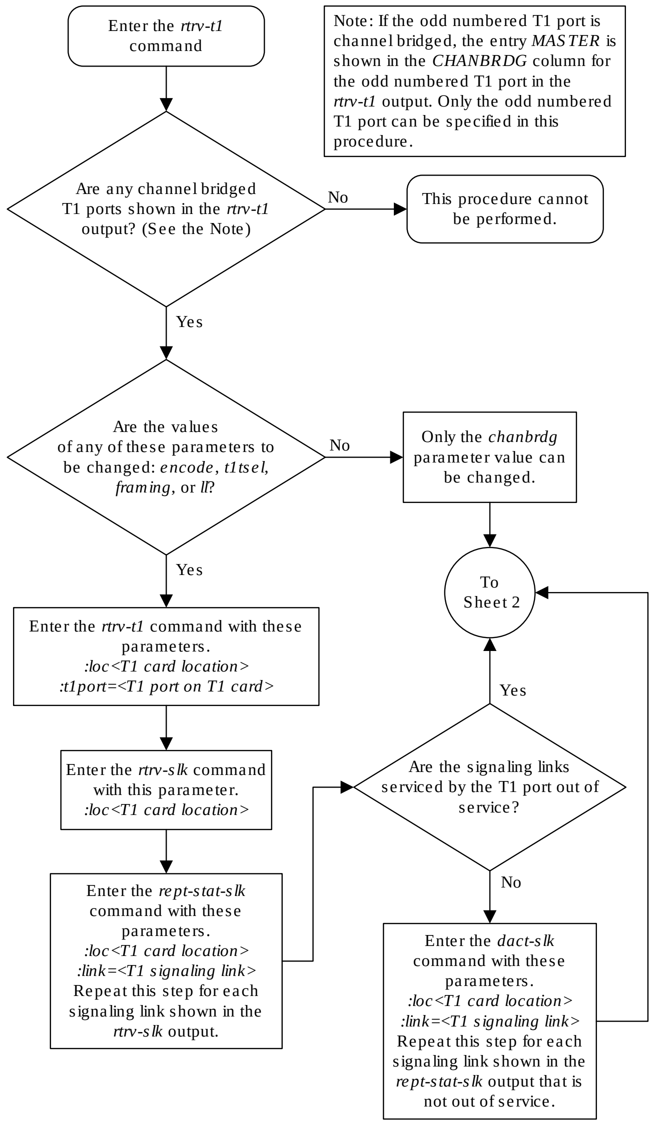
```
rlghncxa03w 09-05-07 08:41:12 GMT  EAGLE5 41.0.0
Activate Link message sent to card
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

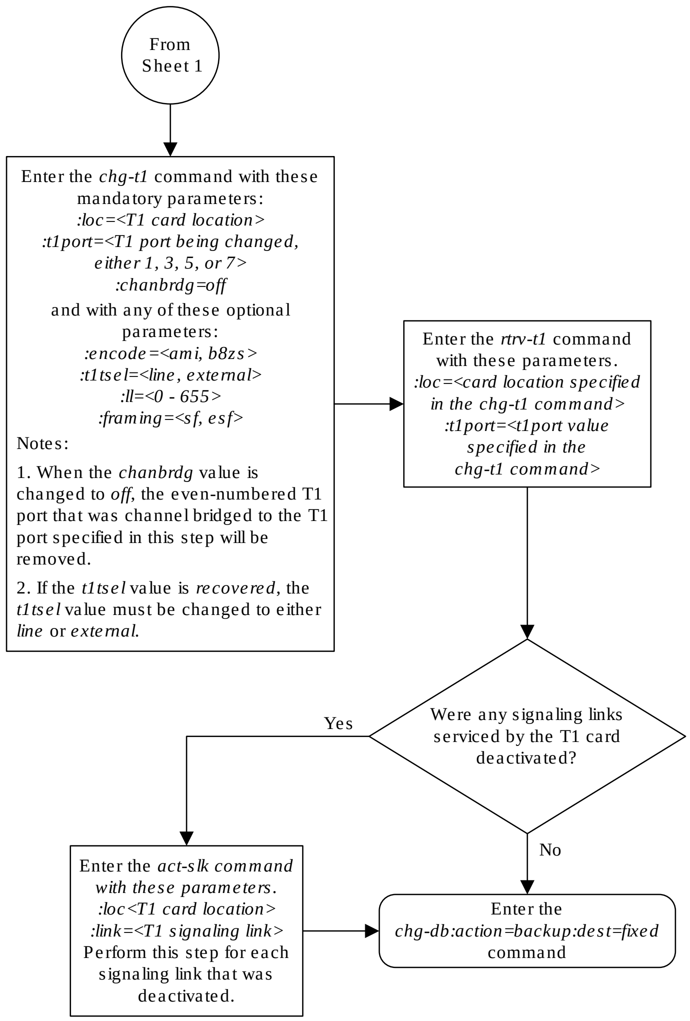
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Figure B-13 Making a Non-Channel Bridged T1 Port from a Channel Bridged T1 Port



Sheet 1 of 2



Sheet 2 of 2

B.14 Adding a T1 Signaling Link

This procedure is used to add a **T1** signaling link to the database using the `ent-slk` command and these parameters.

`:loc` – The card location of the card that the **T1** signaling link will be assigned to.

`:link` – The signaling link on the card specified in the `loc` parameter.

`:lsn` – The name of the linkset that will contain the signaling link.

`:slc` – The signaling link code. The **SLC** must be unique within the linkset. It must be the same at both the **EAGLE** location and the distant node.

`:bps` – The transmission rate for the link in bits per second.

`:ecm` – Error correction method, either `basic` or `pcr`. The default value for this parameter is `basic`.

`:pcrn1` – The threshold of the number of **MSUs** available for retransmission. If the error correction method being used is **PCR** (`:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISU**s are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

`:pcrn2` – The threshold of the number of **MSU** octets available for retransmission. If the error correction method being used is **PCR** (`:ecm=pcr`), and this threshold is reached, no new **MSUs** or **FISU**s are sent. The retransmission cycle is continued up to the last **MSU** entered into the retransmission buffer in the order in which they were originally transmitted.

`:ts` – The timeslot on the **T1** card or channel card being used for the **T1** signaling link.

`:t1port` – The **T1** port on the **T1** card that is servicing the timeslot selected for the **T1** signaling link.

`:t1loc` – The location of the **T1** card servicing the timeslot selected for the **T1** signaling link. This parameter can be specified only when provisioning **T1** signaling links on channel cards.

`:l2tset` – The level 2 timer set table assigned to the **T1** signaling link. The type of linkset the **T1** signaling link is assigned to and the **T1** card's application determines the value of the `l2tset` parameter. The level 2 timer set tables are defined in the Changing Level 2 Timers procedure.

The `ent-slk` command contains other optional parameters that can be used to configure a signaling link. These parameters are not shown here because they are not necessary to provision a **T1** signaling link. These parameters are explained in more detail in the Adding an SS7 Signaling Link procedure, or in the `ent-slk` command description in the *Commands User's Guide*.

These items must be configured in the database before a **T1** signaling link can be added:

- Shelf – see "Adding a Shelf" in *Database Administration - System Management User's Guide*
- T1 **Card** (card type `limt1`) or **ChannelCard** (card type `limch`) running either the `ss7ansi` or `ccs7itu` applications – see Adding a LIM-T1 Card procedure
- Destination **Point Code** – see the Adding a Destination Point Code procedure.
- Linkset – Adding an SS7 Linkset .

Verify that the link has been physically installed (all cable connections have been made).

T1 port 2 (`t1port=2`) cannot be specified when the **T1** signaling link is assigned to a channel card (card type `limch`).

The value of the `bps` parameter must be either 56000 or 64000.

The values for the `ts` parameter must be from 1 to 24.

The linkset must be in the database. The number of signaling links in a linkset cannot exceed 16. This can be verified with the `rtrv-ls` command.

The **APC** of the linkset assigned to the signaling link must be in the **SS7** domain. Use the `rtrv-dstn` command to verify the domain of the **APC** of the linkset.

The `pcrn1` or `pcrn2` parameters can only be specified if the `ecm=pcr` parameter is specified.

If the T1 signaling link is being assigned to an unchannelized T1 port (shown by the entry `UNCHAN` in the `LINKCLASS` field in the `rtrv-t1` output), you cannot specify the `ts` parameter. A T1 signaling link containing an unchannelized T1 port can be assigned only to an **E5-E1T1** card. A maximum of one T1 signaling link containing an unchannelized T1 port can be assigned to an E5-E1T1 card. The `link` parameter value for this link must be `a`. The transmission rate (`bps` parameter) for an unchannelized T1 signaling link is 1536000 bits per second. The `bps` parameter is optional, and if not specified with the `ent-slk` command, the `bps` parameter value defaults to 1536000 bits per seconds.

If the **T1** signaling link is being assigned to a channel bridged **T1** port (shown by the entries `MASTER` or `SLAVE` in the `CHANBRDG` field in the `rtrv-t1` output), the **T1** port value for the signaling link must be the odd numbered (`MASTER`) **T1** port.

If the **T1** card is an **E1**/**T1 MIM**, a maximum of 8 **T1** signaling links can be assigned to the card. The range of `link` parameter values is dependent on the type of **T1** card the signaling link is assigned to. The `link` parameter values for **T1** signaling links assigned to **E1**/**T1 MIMs** are A - A3, or B - B3, allowing a maximum of 8 signaling links on the card.

If the T1 signaling link is being assigned to a channelized T1 port (shown by the entry `CHAN` in the `LINKCLASS` field in the `rtrv-t1` output) on an HC-MIM, a maximum of 64 **T1** signaling links can be assigned to the card. The `link` parameter values for **T1** signaling links assigned to **HC**-**MIMs** are A - A31, or B - B31. If signaling links A16 to A31, or B16 to B31 will be assigned to the card, the **FAN** feature must be turned on. The status of the **FAN** feature is shown in the `rtrv-feat` command output. The shelf containing the **HC**-**MIM** being added in this procedure must have fans installed. If the fans are not installed on the shelf containing the **HC**-**MIM**, go to *Installation Guide* and install the fans.

If the T1 signaling link is being assigned to a channelized T1 port (shown by the entry `CHAN` in the `LINKCLASS` field in the `rtrv-t1` output) on an E5-E1T1 card, a maximum of 32 **T1** signaling links can be assigned to the card. The `link` parameter values for **T1** signaling links assigned to **E5-E1T1** cards are A - A15 or B - B15.

To configure the **EAGLE** to perform circular routing detection test on the signaling links, perform the Configuring Circular Route Detection procedure.

> **Note:**
>
> Circular route detection is not supported in **ITU** networks.

To provision a **EAGLE** with more than 1200 signaling links, the **EAGLE** must have certain levels of hardware installed. See the Requirements for EAGLEs Containing more than 1200 Signaling Links section for more information on these hardware requirements.

The **EAGLE** can contain a mixture of low-speed, **E1**, **T1**, **ATM** high-speed, and **IP** signaling links. The Determining the Number of High-Speed and Low-Speed Signaling Links section describes how to determine the quantities of the different types of signaling links the **EAGLE** can have.

Canceling the `REPT-STAT-SLK` and `RTRV-SLK` Commands

Because the `rept-stat-slk` and `rtrv-slk` commands used in this procedure can output information for a long period of time, the `rept-stat-slk` and `rtrv-slk` commands can be canceled and the output to the terminal stopped. There are three ways that the `rept-stat-slk` and `rtrv-slk` commands can be canceled.

- Press the `F9` function key on the keyboard at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered, from another terminal other that the terminal where the `rept-stat-slk` or `rtrv-slk` commands was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to *Commands User's Guide*.

1. Display the cards in the database using the `rtrv-card` command.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE     APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM      GLS
1113   GSPM     OAM
1114   TDM-A
1115   GSPM     OAM
1116   TDM-B
1117   MDAL
1207   LIMT1    SS7ANSI  lsnt265     A    0
1208   LIMCH    SS7ANSI  lsnt265     A    1   lsnt265     A2   2
1211   LIME1    CCS7ITU  lsne145     A    0
1212   LIMCH    CCS7ITU  lsne145     A    1   lsne145     A2   2
1215   LIMT1    SS7ANSI
1216   LIMCH    SS7ANSI
```

   If the required **T1** card or channel card is not in the database, perform Adding a LIM-T1 Card to add the required cards to the database.

2. Display the current linkset configuration using the `rtrv-ls` command. This is an example of the possible output.

```
rlghncxa03w 06-10-10 11:43:04 GMT EAGLE5 36.0.0

                                      L3T SLT              GWS GWS GWS
LSN           APCA     (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsnt145       150-075-038   scr4  1   1   yes a   0    on  on  off ---
---
lsnt265       200-150-067   scr2  1   1   yes a   3    on  on  off ---
---

                                      L3T SLT              GWS GWS GWS
LSN           APCI     (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsne12        2-150-7       scr1  1   1   no  a   2    on  on  off ---
---
lsne145       4-049-3       scr1  1   1   no  a   3    on  on  off ---
---
sp5           1-111-3       scr3  1   3   yes c   1    off off off ---
---
sp6           1-111-1       scr1  1   1   yes a   1    off off off ---
---
sp7           1-111-2       scr2  1   2   no  a   2    on  on  on  ---
---

                                      L3T SLT              GWS GWS GWS
LSN           APCN     (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsne13        14950         scr1  1   1   no  a   2    on  on  off ---
off
nsp1          11111         scr1  1   1   yes a   2    off off off ---
off
nsp3          11112         scr2  1   2   no  a   1    on  on  on  ---
off
nsp4          11113         scr3  1   3   yes c   1    off off off ---
off

Link set table is ( 11 of 1024)  1% full
```

If the desired linkset is not in the database, perform Adding an SS7 Linkset to add the linkset to the database. After the linkset has been added to the database, continue the procedure with 4.

If the desired linkset is in the database, continue the procedure with 3.

3. Display the attributes of the linkset that will contain the new signaling link by entering the `rtrv-ls` command with the name of the linkset shown in 2. For this example, enter this command.

```
rtrv-ls:lsn=lsnt145
```

This is an example of the possible output.

```
rlghncxa03w 08-12-10 11:43:04 GMT EAGLE5 40.0.0

                                L3T SLT                 GWS GWS GWS
LSN          APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
lsnt145      150-075-038    scr4 1   1   yes a   0    on  on  off
---   ---

                SPCA            CLLI          TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  1          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE          CGGTMOD
           no    no       CdPA              no

Link set table is (11 of 1024) 1% full.
```

The signaling link cannot be assigned to a linkset whose `IPSG` or `IPGWAPC` values are `yes`. If either the `IPSG` or `IPGWAPC` value for the linkset is `yes`, repeat the procedure from 2 and choose another linkset.

If the `IPSG` and `IPGWAPC` values for the linkset are `no`, continue the procedure with 4.

4. Display the current signaling link configuration using the `rtrv-slk` command. This is an example of the possible output.

```
rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0
                                      L2T              PCR  PCR
LOC  LINK LSN         SLC TYPE      SET  BPS     ECM   N1   N2
1201 A    e3m1s1      0   LIMDS0    1    56000   BASIC ---- ------
1201 B    e3m1s2      0   LIMDS0    1    56000   BASIC ---- ------
1202 A    e3m1s1      1   LIMDS0    1    56000   BASIC ---- ------
1202 B    e3m1s2      1   LIMDS0    1    56000   BASIC ---- ------
1203 A    e3m1s1      2   LIMDS0    1    56000   BASIC ---- ------
1203 B    e3m1s2      2   LIMDS0    1    56000   BASIC ---- ------
1204 A    e3m1s1      3   LIMDS0    1    56000   BASIC ---- ------
1204 B    e3m1s2      3   LIMDS0    1    56000   BASIC ---- ------
1205 A    e3m1s1      4   LIMDS0    1    56000   BASIC ---- ------
1205 B    e3m1s2      4   LIMDS0    1    56000   BASIC ---- ------
1206 A    e3m1s1      5   LIMDS0    1    56000   BASIC ---- ------
1206 B    e3m1s2      5   LIMDS0    1    56000   BASIC ---- ------
1213 A    e3m2s1      2   LIMDS0    11   56000   BASIC ---- ------
1213 B    e3m2s2      2   LIMDS0    11   56000   BASIC ---- ------
1214 A    e3m2s1      3   LIMDS0    11   56000   BASIC ---- ------
1214 B    e3m2s2      3   LIMDS0    11   56000   BASIC ---- ------
1215 A    e3m2s1      4   LIMDS0    11   56000   BASIC ---- ------
1215 B    e3m2s2      4   LIMDS0    11   56000   BASIC ---- ------
```

```
1216 A     e3m2s1      5    LIMDS0    11    56000  BASIC ---- ------
1216 B     e3m2s2      5    LIMDS0    11    56000  BASIC ---- ------
1217 A     e3m2s1      6    LIMDS0    11    56000  BASIC ---- ------
1217 B     e3m2s2      6    LIMDS0    11    56000  BASIC ---- ------

                                   L2T                 PCR  PCR    E1    E1
LOC   LINK LSN         SLC TYPE    SET  BPS     ECM    N1   N2     LOC   PORT
TS
1211 A     lsne145       0  LIME1    1    56000  BASIC ---  ----- 1211 2
10
1212 A     lsne145       1  LIMCH    1    56000  BASIC ---  ----- 1211 1
14
1212 A2    lsne145       2  LIMCH    1    56000  BASIC ---  ----- 1211 1
20

                                   L2T                 PCR  PCR    T1    T1
LOC   LINK LSN         SLC TYPE    SET  BPS     ECM    N1   N2     LOC   PORT
TS
1207 A     lsnt265       0  LIMT1    1    56000  BASIC ---  ----- 1207 2
2
1208 A     lsnt265       1  LIMCH    1    56000  BASIC ---  ----- 1207 1
6
1208 A2    lsnt265       2  LIMCH    1    56000  BASIC ---  ----- 1207 1
17

SLK TABLE is ( 28 of 1200) 2% full.
```

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have (in this example, the maximum number of signaling links is 1200), and the maximum number of signaling links is 2800, this procedure cannot be performed. The EAGLE cannot contain more than 2800 signaling links.

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have, and the maximum number of signaling links is less than 2800, perform the Enabling the Large System # Links Controlled Feature procedure to enable the desired quantity of signaling links.

If the addition of the new signaling link will not exceed the maximum number of signaling links the EAGLE can have, or if a new signaling link quantity was enabled, continue the procedure by performing one of these steps.

- If the signaling link will be assigned to a channel card (LIMCH), continue the procedure with 10.
- If the signaling link will be assigned to a LIMT1 card, continue the procedure with 5.

5. Display the **T1** interfaces that will be assigned to the **T1** signaling link using the `rtrv-t1` command with no parameters.

```
rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

      T1                                                 LINK     MINSU
LOC   PORT   ENCODE   T1TSEL     FRAMING  LL    CHANBRDG  CLASS    RATE
1207  1      AMI      EXTERNAL   ESF      50    -----     CHAN     ----
1215  2      B8ZS     LINE       SF       100   -----     CHAN     ----
```

If the desired T1 port and T1 card combination is shown in the `rtrv-e1` output, continue the procedure with 6.

If the desired **T1** port and **T1** card combination is not shown in the `rtrv-t1` output, add the **T1** port and **T1** card combination to the database by performing one of these procedures.

- Adding Channelized and non-Channel Bridged T1 Ports
- Adding Channel Bridged T1 Ports
- Adding Unchannelized T1 Ports

After the desired T1 port and T1 card combination has been added to the database, continue the procedure with 6.

6. Verify the card type of the card that will contain the new T1 signaling link by entering this command.

```
rtrv-stp:type=limt1


rlghncxa03w 08-12-30 11:07:17 EST  EAGLE 40.0.0

Card  Part Number  Rev  Serial Number  Type     DB    APPL
GPL Version
----  -----------  ---  -------------  ----     --    ----
-----------

1207  870-2671-02  C    10145689323    LIMT1    512M  SS7ANSI
126-034-000
1215  870-1873-01  C    10345690569    LIMT1    512M  SS7ANSI
126-034-000

Command Completed.
```

The **T1** card types and their part numbers are shown in Table B-4.

If the new T1 signaling link will be assigned to a E1/T1 MIM or E5-E1T1 card, continue the procedure with 10.

If the new E1 signaling link will be assigned to an HC-MIM, and the `link` parameter value of the new signaling link is A-A15 or B-B15, continue the procedure with 10.

If the new E1 signaling link will be assigned to an HC-MIM, and the `link` parameter value of the new signaling link is A16-A31 or B16-B31, continue the procedure by performing one of these steps.

- If the `link` parameter values A16-A31 or B16-B31 are shown in the `rtrv-slk` output in 4, and the new signaling link will be assigned to a card on the same shelf as the cards the contain the `link` parameter values A16-A31 or B16-B31, continue the procedure with 10.
- If the `link` parameter values A16-A31 or B16-B31 are shown in the `rtrv-slk` output in 4, and the new signaling link will be assigned to a card that is not on the same shelf as the cards the contain the `link` parameter values A16-A31 or B16-B31, continue the procedure with 9.

- If the `link` parameter values A16-A31 or B16-B31 are not shown in the `rtrv-slk` output in 4, continue the procedure with 7.

7. Verify whether or not that the Fan feature is on, by entering the `rtrv-feat` command. If the Fan feature is on, the entry `FAN = on` appears in the `rtrv-feat` command output.

   > **Note:**
   >
   > The `rtrv-feat` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 9.

8. Turn the Fan feature on by entering this command.

   ```
   chg-feat:fan=on
   ```

   > **Note:**
   >
   > Once the Fan feature is turned on with the `chg-feat` command, it cannot be turned off.
   > The Fan feature must be purchased before you turn this feature on with the `chg-feat` command. If you are not sure if you have purchased the Fan feature, contact your Oracle Sales Representative or Account Representative.

9. The shelf containing the **HC-MIM** being added in this procedure must have fans installed. Verify whether or not fans are installed on the shelf.

   If the fans are installed, continue the procedure with 10.

   If the fans are not installed on the shelf containing the **HC-MIM**, go to *Installation Guide* and install the fans. Once the fans have been installed and tested, 10 . The fans must be working properly before an **HC-MIM** can be placed in the **EAGLE**.

10. Add the T1 signaling links using the `ent-slk` command.

    Enter the `ent-slk` command with the parameter combinations shown in Table B-18.

Table B-18 T1 Signaling Link Parameter Combinations

T1 Signaling Links assigned to a Channel Card	T1 Signaling Links assigned to an E1/T1 MIM	T1 Signaling Links assigned to an HC-MIM	T1 Signaling Links assigned to an E5-E1T1 Card with a Channelized T1 Port	T1 Signaling Links assigned to an E5-E1T1 Card with an Unchannelized T1 Port
		Mandatory Parameters		
:loc=<the location of the channel card>	:loc=<the location of the LIMT1 card>	:loc=<the location of the LIMT1 card>	:loc=<the location of the LIMT1 card>	:loc=<the location of the LIMT1 card>
:link=A - A3, B - B3	:link=A - A3, B - B3	:link=A - A31, B - B31 (See Note 1)	:link=A - A15, B - B15	:link=a

Table B-18 (Cont.) T1 Signaling Link Parameter Combinations

T1 Signaling Links assigned to a Channel Card	T1 Signaling Links assigned to an E1/T1 MIM	T1 Signaling Links assigned to an HC-MIM	T1 Signaling Links assigned to an E5-E1T1 Card with a Channelized T1 Port	T1 Signaling Links assigned to an E5-E1T1 Card with an Unchannelized T1 Port
:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>	:lsn=<the name of the linkset>
:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15	:slc= 0 - 15
:t1loc=<the location of the LIMT1 card>	:t1port= 1 or 2	:t1port= 1 - 8	:t1port= 1 - 8	:t1port= 1 - 8
:ts= 1 - 24	:ts= 1 - 24	:ts= 1 - 24	:ts= 1 - 24	
Optional Parameters				
:bps=56000, 64000 Default value = 56000	:bps=56000, 64000 Default value = 56000	:bps=56000, 64000 Default value = 56000	:bps=56000, 64000 Default value = 56000	:bps=1536000 Default value = 1536000
:ecm=basic, pcr Default value = basic	:ecm=basic, pcr Default value = basic	:ecm=basic, pcr Default value = basic	:ecm=basic, pcr Default value = basic	:ecm=basic, pcr Default value = basic
:pcrn1= 1 - 127 (See Note 2) Default value = 76	:pcrn1= 1 - 127 (See Note 2) Default value = 76	:pcrn1= 1 - 127 (See Note 2) Default value = 76	:pcrn1= 1 - 127 (See Note 2) Default value = 76	:pcrn1= 1 - 1023 (See Note 2) Default value = 608
:pcrn2=300 - 35500 (See Note 2) Default value = 3800	:pcrn2=300 - 35500 (See Note 2) Default value = 3800	:pcrn2=300 - 35500 (See Note 2) Default value = 3800	:pcrn2=300 - 35500 (See Note 2) Default value = 3800	:pcrn2=7200 - 287744 (See Note 2) Default value = 32224
:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16	:l2tset=See Table 3-16
Notes: 1. If the Fan feature is not turned on, the `link` parameter values for a T1 signaling link are A - A15, B - B15. 2. The `pcrn1` and `pcrn2` parameters can be specified only if the `ecm=pcr` parameter is specified.				

For this example, enter these commands.

```
ent-
slk:loc=1215:link=a:lsn=lsnt145:slc=0:bps=56000:ts=3:t1port=
2
```

```
ent-
slk:loc=1216:link=a:lsn=lsnt145:slc=1:bps=56000:ts=11:t1loc=
1215
```

```
ent-
slk:loc=1216:link=a2:lsn=lsnt145:slc=2:bps=56000:ts=19:t1loc
=1215
```

```
ent-
slk:loc=2211:link=a:t1port=1:lsn=lsnt1:slc=0:ecm=pcr:pcrn1=90:pcr
n2=9000
```

> **Note:**
>
> If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the `rtrv-measopts` output is `on`, the scheduled UI measurement reports will be disabled.

11. Verify the changes using the `rtrv-slk` command, specifying the card location and signaling link entered in 10 . This is an example of the possible output.

```
rtrv-slk:loc=1215


rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

                                  L2T              PCR  PCR     T1   T1
LOC  LINK LSN         SLC TYPE     SET  BPS     ECM  N1   N2      LOC  PORT
TS
1215 A    lsnt145     0   LIMT1    1    56000   BASIC ---  -----  1215 2
3

rtrv-slk:loc=1216


rlghncxa03w 06-10-19 21:17:04 GMT EAGLE5 36.0.0

                                  L2T              PCR  PCR     T1   T1
LOC  LINK LSN         SLC TYPE     SET  BPS     ECM  N1   N2      LOC  PORT
TS
1216 A    lsnt145     1   LIMCH    1    56000   BASIC ---  -----  1215 1
11
1216 A2   lsnt145     2   LIMCH    1    56000   BASIC ---  -----  1215 1
19

rtrv-slk:loc=2211


rlghncxa03w 09-05-19 21:17:04 GMT EAGLE5 41.0.0

                                  L2T              PCR  PCR     T1   T1
LOC  LINK LSN         SLC TYPE     SET  BPS     ECM  N1   N2      LOC  PORT
TS
2211 A    lsnt1       0   LIMT1    31   1.536M PCR   90   9000    2211 1
1
```

If any of the cards shown in this step contain the first signaling link on a card, continue the procedure with 12.

If signaling links were assigned to all the cards shown in this step when 10 was performed, continue the procedure with 13.

12. Bring the cards into service with the `rst-card` command, specifying the card location specified in 10 . For this example, enter these commands.

    `rst-card:loc=1215`

    `rst-card:loc=1216`

    `rst-card:loc=2211`

    When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-23 13:05:05 GMT EAGLE5 36.0.0
Card has been allowed.
```

13. Activate all signaling links on the cards using the `act-slk` command, specifying the card location and signaling link specified in 10 . For this example, enter these commands.

    `act-slk:loc=1215:link=a`

    `act-slk:loc=1216:link=a`

    `act-slk:loc=1216:link=a2`

    `act-slk:loc=2211:link=a`

    When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:31:24 GMT  EAGLE5 36.0.0
Activate Link message sent to card
```

14. Check the status of the signaling links added in 10 using the `rept-stat-slk` command with the card location and signaling link. The state of each signaling link should be in service normal (**IS-NR**) after the link has completed alignment (shown in the `PST` field). For this example, enter these commands.

    `rept-stat-slk:loc=1215:link=a`

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1215,A  lsnt145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  T1 status          = 1215, RCVRY-T1F:FAC-T1 Port 2 available
```

    `rept-stat-slk:loc=1216:link=a`

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1216,A  lsnt145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
```

```
  UNAVAIL REASON     = --
  T1 status          = 1215, RCVRY-T1F:FAC-T1 Port 1 available
```

```
rept-stat-slk:loc=1216:link=a2
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK     LSN       CLLI        PST          SST       AST
1216,A2 lsnt145   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  T1 status          = 1215, RCVRY-T1F:FAC-T1 Port 1 available
```

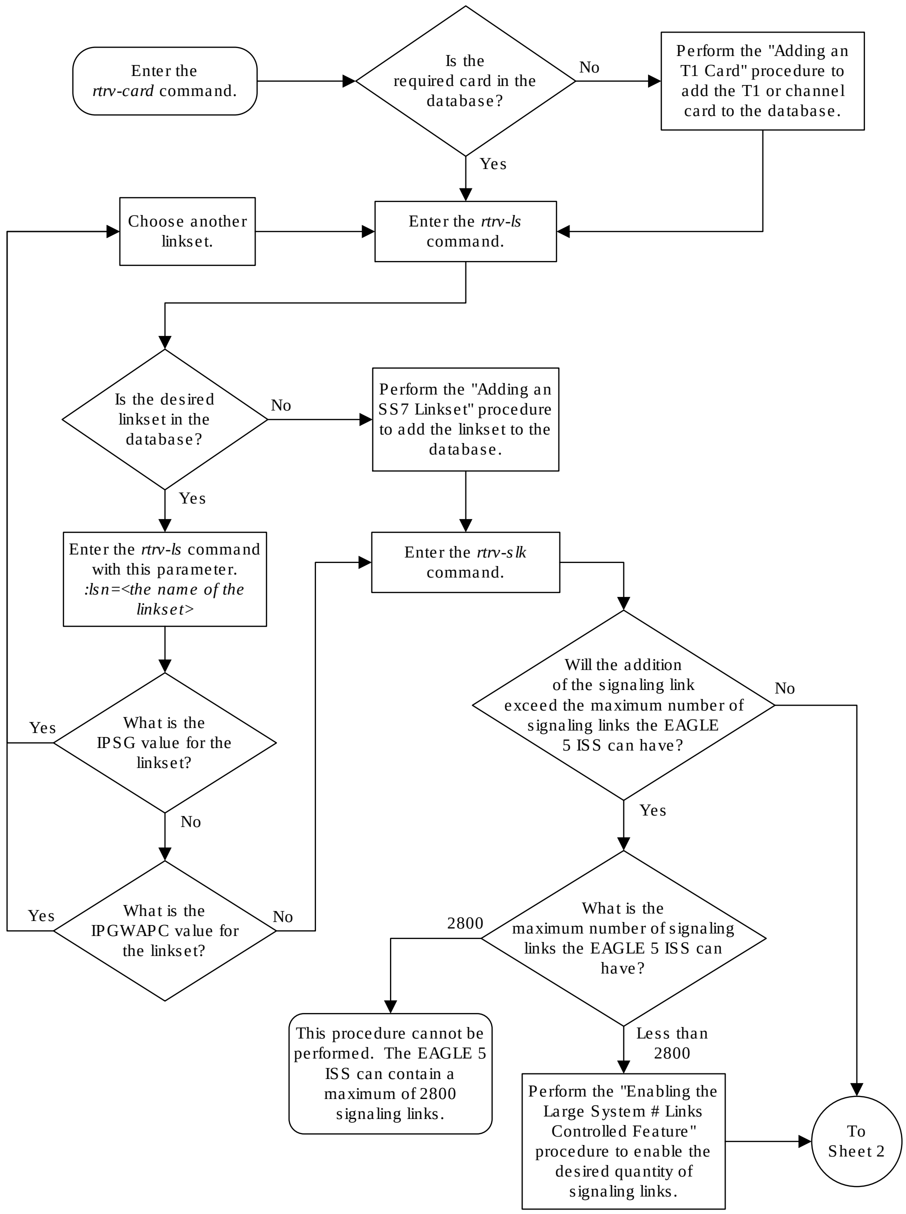
```
rept-stat-slk:loc=2211:link=a
```

```
rlghncxa03w 06-10-23 13:06:25 GMT EAGLE5 36.0.0
SLK     LSN       CLLI        PST          SST       AST
2211,A  lsnt1     ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
  T1 status          = 2211, RCVRY-T1F:FAC-T1 Port 1 available
```

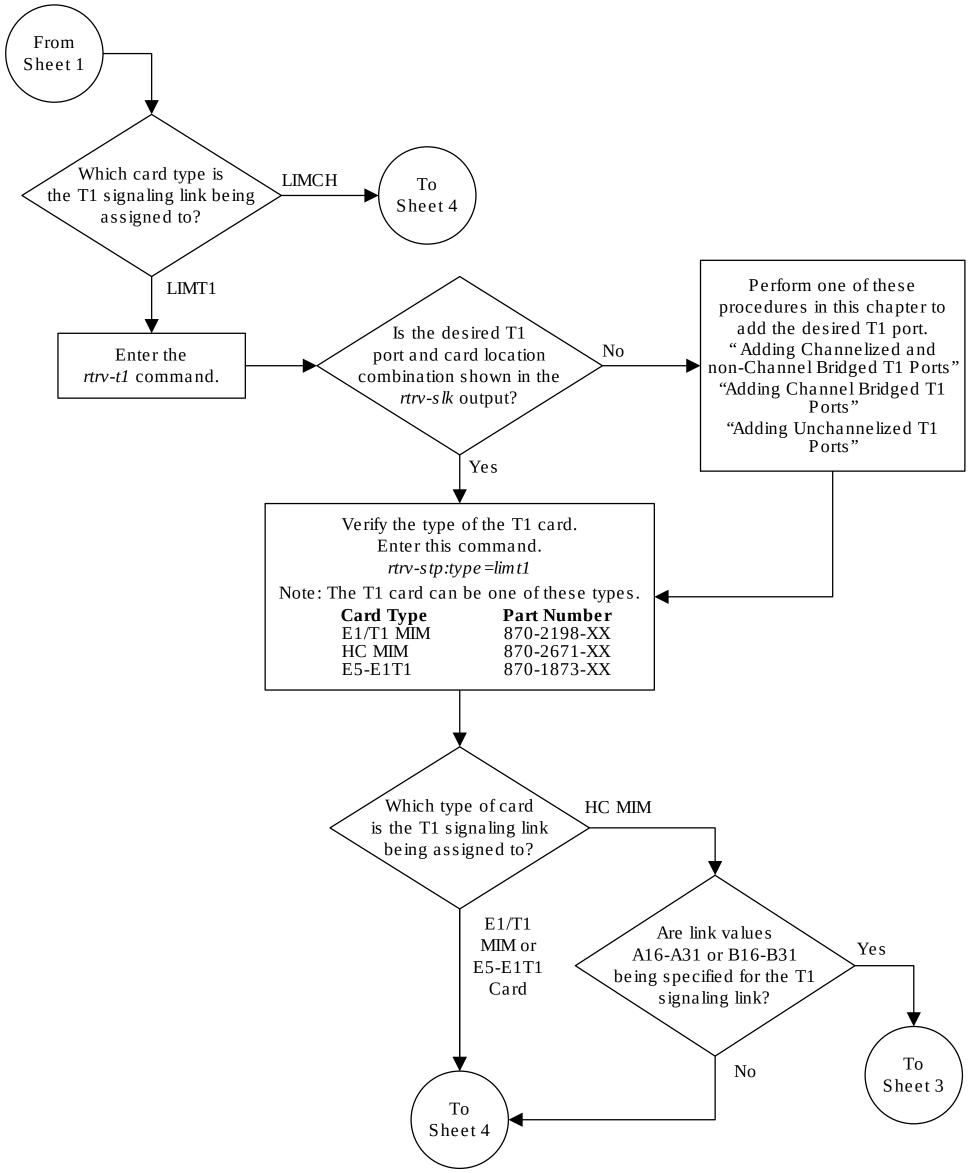
15. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

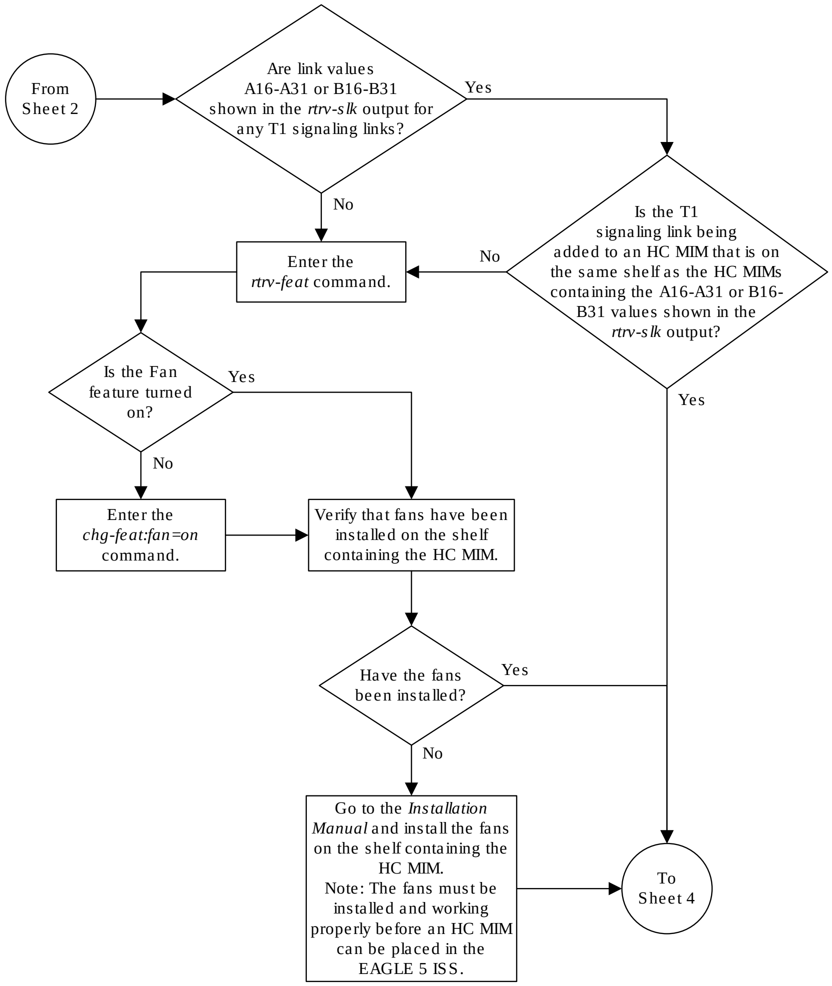
Figure B-14 Adding a T1 Signaling Link



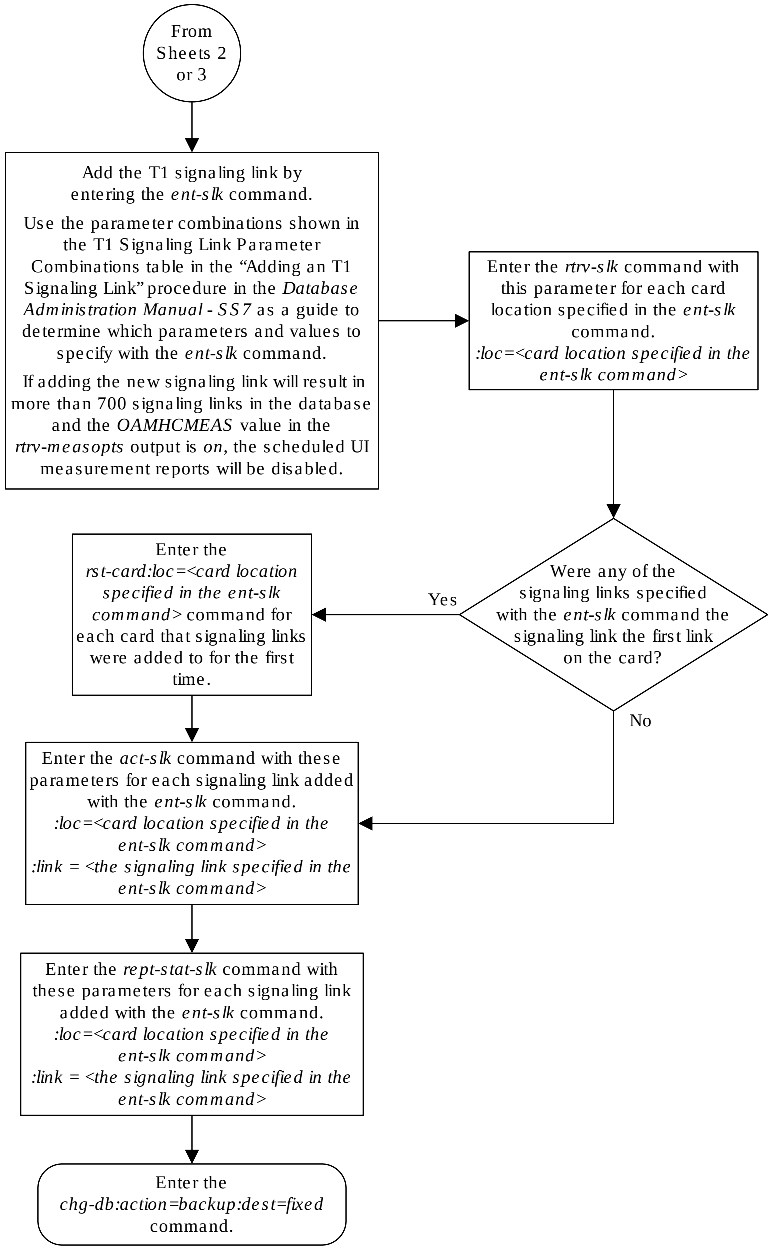
Sheet 1 of 4


From Sheet 1
Which card type is the T1 signaling link being assigned to?
LIMCH
To Sheet 4
LIMT1
Enter the *rtrv-t1* command.
Is the desired T1 port and card location combination shown in the *rtrv-slk* output?
No
Perform one of these procedures in this chapter to add the desired T1 port.
"Adding Channelized and non-Channel Bridged T1 Ports"
"Adding Channel Bridged T1 Ports"
"Adding Unchannelized T1 Ports"
Yes
Verify the type of the T1 card. Enter this command.
rtrv-stp:type=limt1
Note: The T1 card can be one of these types.
Card Type **Part Number**
E1/T1 MIM 870-2198-XX
HC MIM 870-2671-XX
E5-E1T1 870-1873-XX
Which type of card is the T1 signaling link being assigned to?
HC MIM
E1/T1 MIM or E5-E1T1 Card
Are link values A16-A31 or B16-B31 being specified for the T1 signaling link?
Yes
To Sheet 3
No
To Sheet 4

Sheet 2 of 4


From Sheet 2
Are link values A16-A31 or B16-B31 shown in the rtrv-slk output for any T1 signaling links?
Yes
No
Is the T1 signaling link being added to an HC MIM that is on the same shelf as the HC MIMs containing the A16-A31 or B16-B31 values shown in the rtrv-slk output?
No
Yes
Enter the rtrv-feat command.
Is the Fan feature turned on?
Yes
No
Enter the chg-feat:fan=on command.
Verify that fans have been installed on the shelf containing the HC MIM.
Have the fans been installed?
Yes
No
Go to the Installation Manual and install the fans on the shelf containing the HC MIM.
Note: The fans must be installed and working properly before an HC MIM can be placed in the EAGLE 5 ISS.
To Sheet 4

Sheet 3 of 4


From Sheets 2 or 3
Add the T1 signaling link by entering the *ent-slk* command.
Use the parameter combinations shown in the T1 Signaling Link Parameter Combinations table in the "Adding an T1 Signaling Link" procedure in the *Database Administration Manual - SS7* as a guide to determine which parameters and values to specify with the *ent-slk* command.
If adding the new signaling link will result in more than 700 signaling links in the database and the *OAMHCMEAS* value in the *rtrv-measopts* output is *on*, the scheduled UI measurement reports will be disabled.
Enter the *rtrv-slk* command with this parameter for each card location specified in the *ent-slk* command.
:loc=<card location specified in the ent-slk command>
Were any of the signaling links specified with the *ent-slk* command the signaling link the first link on the card?
Yes
No
Enter the *rst-card:loc=<card location specified in the ent-slk command>* command for each card that signaling links were added to for the first time.
Enter the *act-slk* command with these parameters for each signaling link added with the *ent-slk* command.
:loc=<card location specified in the ent-slk command>
:link = <the signaling link specified in the ent-slk command>
Enter the *rept-stat-slk* command with these parameters for each signaling link added with the *ent-slk* command.
:loc=<card location specified in the ent-slk command>
:link = <the signaling link specified in the ent-slk command>
Enter the *chg-db:action=backup:dest=fixed* command.

Sheet 4 of 4

C
ATM Signaling Link Configuration

Appendix C, ATM Signaling Link Configuration, contains general information about the ATM high-speed signaling links and how to provision them.

C.1 Introduction

ATM (**Asynchronous Transfer Mode**) is a transport mechanism that uses virtual connections for transporting information across the network. The **ATM** layer uses the **VPI** and **VCI** fields to define multiple Virtual **Channel** Connections (**VCC**). Within each **VCC**, the **PTI** field is used to distinguish one type of traffic from another. A true **ATM** switch can support multiple **VPI**/**VCI** combinations. The **EAGLE** supports only a single **VPI**/**VCI** combination.

ATM is a specific packet-oriented transfer mode that uses an asynchronous time division multiplexing technique to multiplex information flow in fixed blocks, called cells. **ATM** replaces **MTP**-1 (Signaling Data **Link** Functions) and **MTP**-2 (**Signaling Link** Functions) in the **SS7** protocol stack.

Signaling data link functions (**MTP**-1) are provided by an appropriate physical layer in combination with the **ATM** layer, signaling link functions (**MTP**-2) are provided by the Signaling **ATM** Adaptation Layer (**SAAL**), and the signaling network functions are provided by **MTP** level 3. Figure C-1 illustrates the high-speed link protocol model for **CCS NEs**.

Figure C-1 High-Speed Link Protocol Model for CCS Network Elements

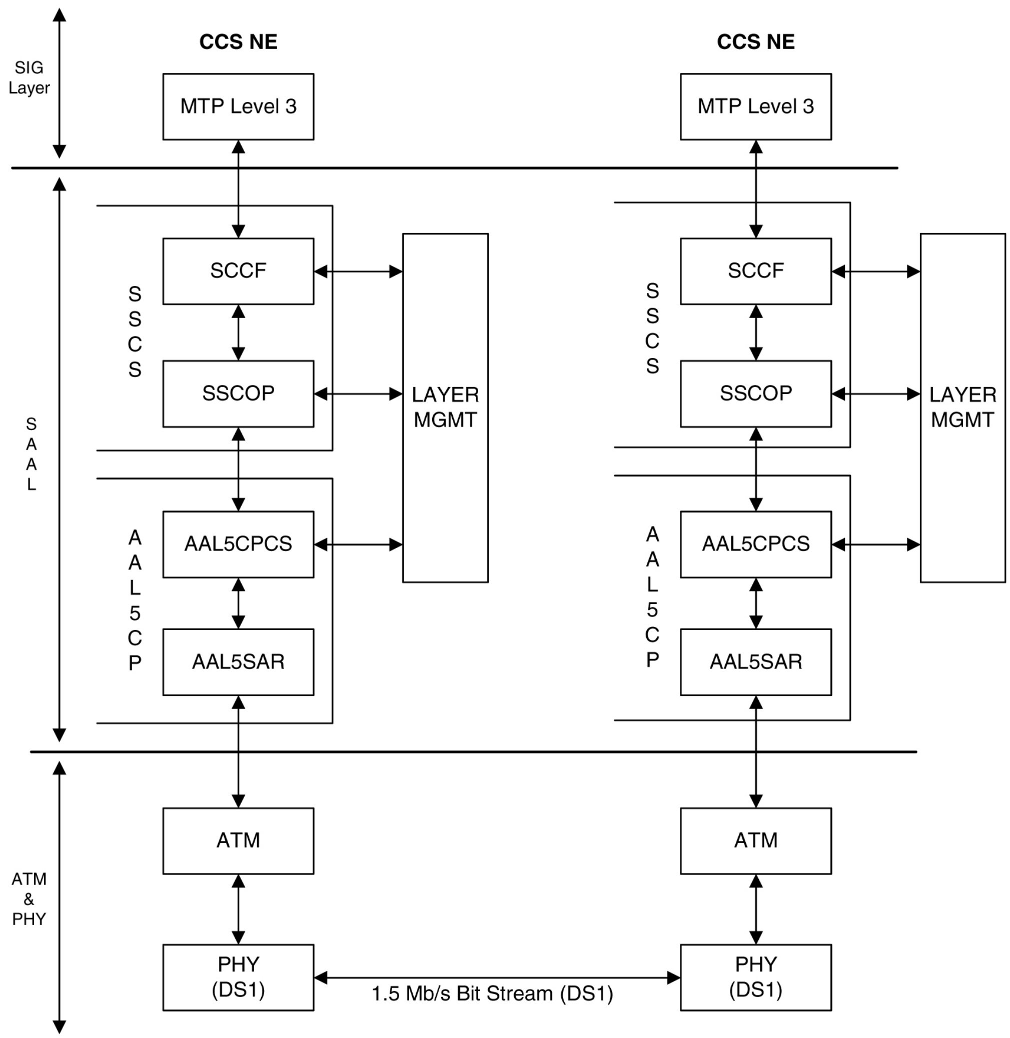
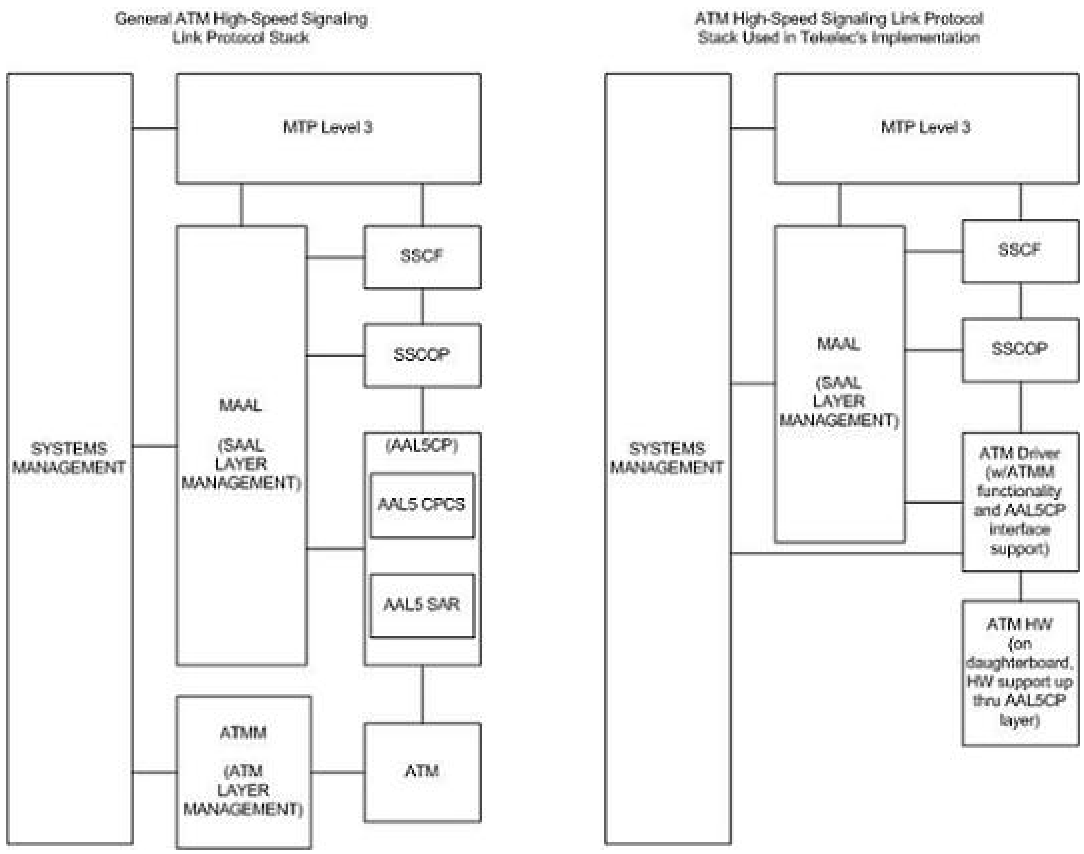


Figure C-2 illustrates some slight differences between the **SAAL** and **ATM** layers and the actual protocol stack used in the Oracle implementation. These differences are as a result of 3 reasons:

- The **AATM** hardware provides **AAL5CP** protocol support (primarily segmentation and reassembly of User Data **PDUs**), thus providing the **AAL5CP** functionality in hardware not software. The **AATM** hardware also provides **CRC10** support for O**AM** F5 **ATM** cell flows.
- The **ATM** driver is not a defined block in the protocol model, but is needed in the Oracle implementation to control and interface with the **AATM** hardware. The **ATM** driver provides the software interface to the hardware **AAL5CP** functionality. The **ATM** driver also provides the **ATMM** (**ATM Layer Management**) functions that are supported in the **EAGLE**.
- As a part of providing **ATM** (**MTP**-level 2 equivalent) functionality into the existing **EAGLE** software (based on **MTP**-3 and **MTP**- 2, not **MTP**-3 and **SAAL**), some of the interfaces to and from **MTP** level 3 will be to and from **MAAL** (rather than **SSCF** handling all **MTP**-3 interaction).

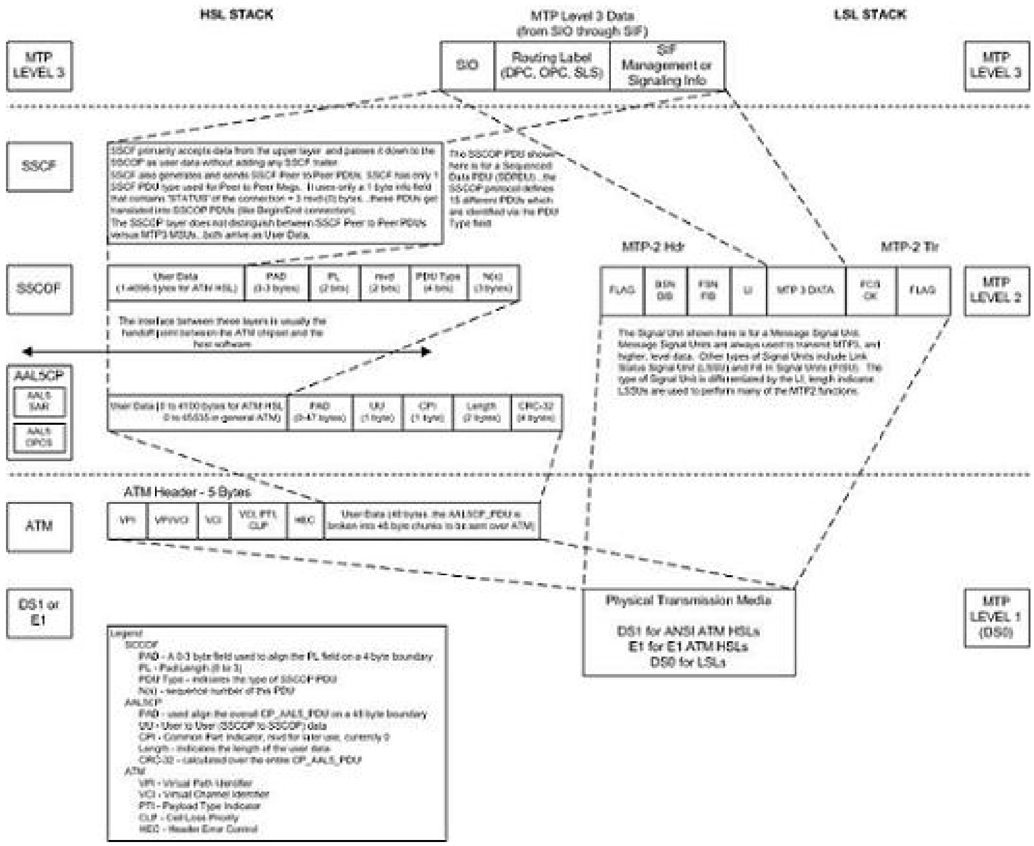
The **EAGLE** implements an **ANSI ATM** high-speed signaling link, transmitting at a rate of 1.544 Mbps, and an **E1 ATM** high-speed signaling link, transmitting at a rate of 2.048 Mbps. Most of the **ANSI** and **E1 ATM** implementations are the same, but there are a few differences. The descriptions in this appendix apply to both implementations. Any differences between **ANSI** and **E1 ATM** are noted.

Figure C-2 ATM High-Speed Signaling Link Protocol Stack vs. Oracle Implementation in the EAGLE



Another way of viewing the high-speed signaling link implementation is to consider the frame formats of the data that is relevant at the various protocol stack layers. Figure C-3 illustrates the differences between the frame formats for high-speed signaling link layers versus the frame formats for traditional (**MTP**-2 & **MTP**-1) low-speed signaling link layers.

Figure C-3 Frame Formats for High-Speed and Low-Speed Signaling Link Protocol Stacks



Based on Figure C-3, the following conclusions can be made regarding the **ATM** traffic and how **ATM** is used to carry **MTP3** data:

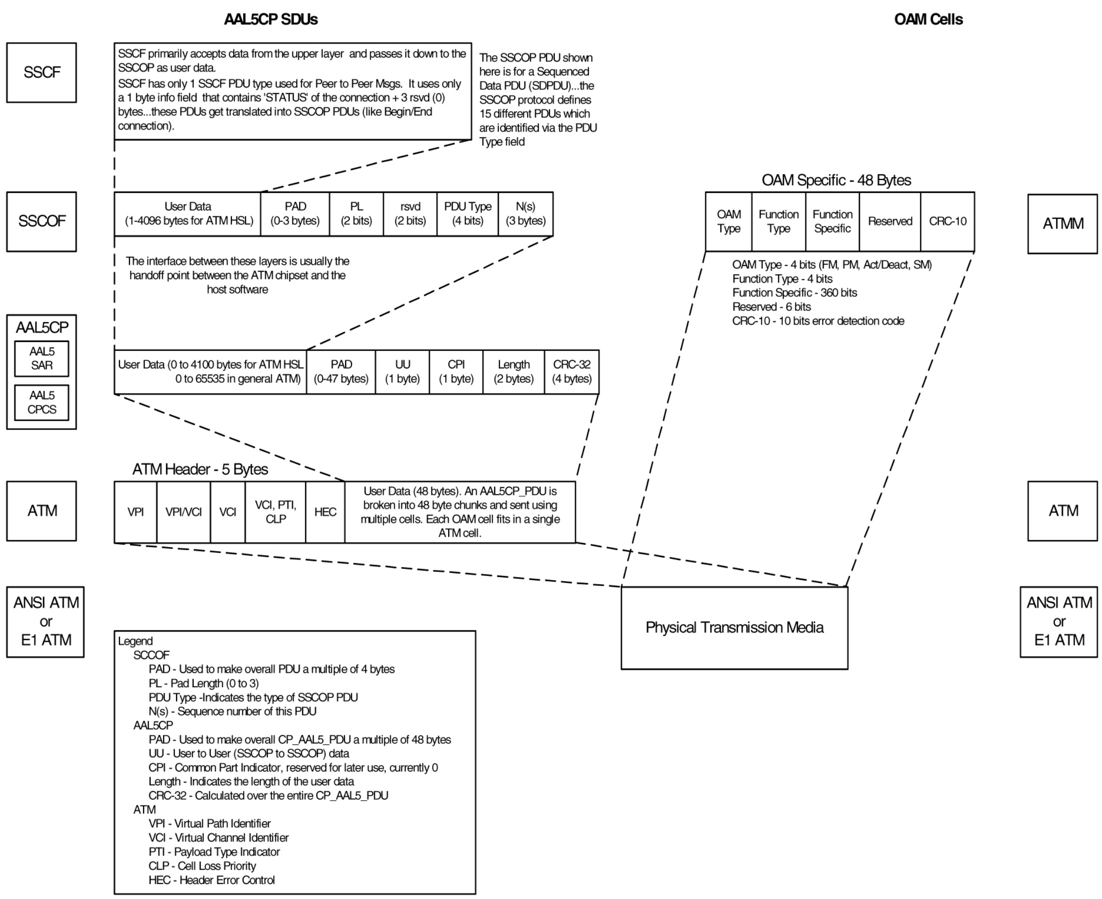
- The **ATM** layer uses the **VPI** and **VCI** fields to define multiple Virtual **Channel** Connections (**VCC**). Within each **VCC**, the **PTI** field is used to distinguish 1 type of traffic from another. A true **ATM** switch can support multiple **VPI**/**VCI** combinations. The **EAGLE** high-speed signaling link implementation needs to support only a single **VPI**/**VCI** combination.
- The **ATM** stack contains built in fields that are used to check the integrity of the data that is received across the **T1** connection. The **ATM** cell **HEC** field and the **AAL5CP CRC**-32 fields are used for data integrity.
- **MTP3** data (or **MSUs**) is transferred as User Data at the **ATM** cell level. A single **MSU** will require 1 or more **ATM** cells to transfer that **MSU**.
- A significant amount of **ATM** protocol overhead is involved in transferring **MSUs.** The overhead includes:
  - **ATM** cell headers
  - **AAL5CP** layer pad bytes and trailer
  - **SSCOP** layer pad bytes and trailer
- In addition to transferring **MSUs**, the **ATM** stack is capable of transferring

- **SSCOP** Peer to Peer Messages **-** these are used primarily for connection setup and tear down and the acknowledgment of transferred data
- **SSCF** Peer to Peer Messages **-** these are used primarily for high-speed signaling link alignment and proving

ATM Protocol Encapsulation

Two main types of data are delivered using **ATM**: **SDUs** and **OAM** cells. **SDUs** provide peer-to-peer information and user data (**MSUs**). **OAM** cells are used for operations and maintenance of the **ATM** connection. Figure C-4 provides the data encapsulation through the **ATM** stack. **MTP3** is a user of **SSCF** and passes all **PDUs** directly to it.

Figure C-4 ATM Protocol Encapsulation



Payload Scrambling

Payload scrambling uses the $x^{43}+1$ scrambling function.

Idle Cells

Idle cells uses the following 5-byte header format:

0x00 0x00 0x00 0x01 0x52.

The content of the information field shall be 0x6A repeated 48 times.

Since idle cells are transmitted on **VPI**=0, **VCI**=0, they are immediately discarded by the receiving end.

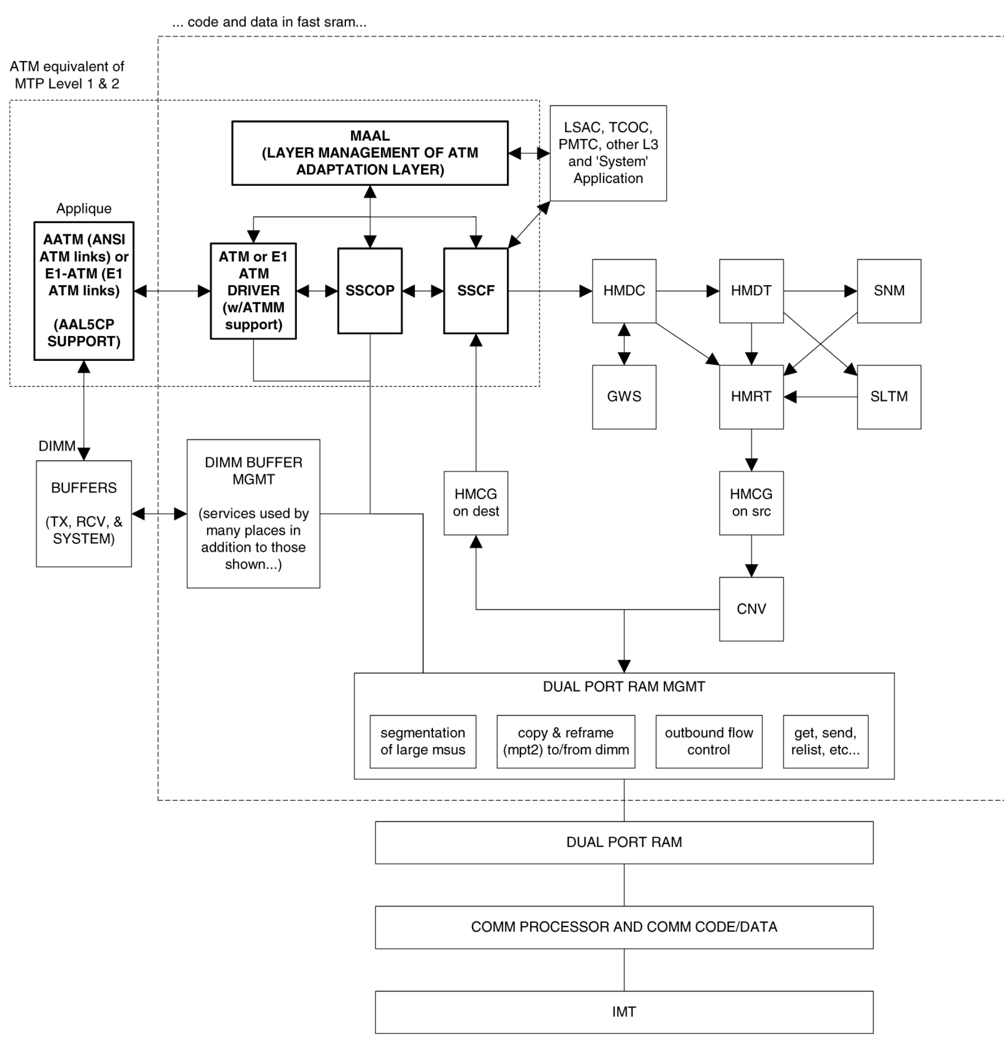
C.2 Overview of the ATM High-Speed Signaling Link LIM Operation

To other cards in the **EAGLE** , the **ANSI ATM** and **E1 ATM** high-speed signaling link cards look and operate similar to any other **LIMs** (with the exception of subtle differences related to load balancing for **SCCP** traffic), but has the potential for increased data throughput with respect to traditional **EAGLE LIMs**.

The **ANSI** and **E1 ATM** high-speed signaling link cards can perform gateway screening, copy and redirect, conversion and any of the other **EAGLE** features that any other **LIM** can perform (with the exception of link fault sectionalization).

A functional block diagram of the **ATM** high-speed signaling link is shown in Figure C-5.

Figure C-5 Functional Block Diagram of ATM High-Speed Signaling Link



The following sections provide more details for each of the new applications/processes (indicated by the bold boxes in Figure C-5) required for the **ATM** high-speed signaling link implementation. These sections will include information such as:

- the specification(s) that defines the layer
- highlights of the functionality provided by the application/process (what problems are being solved here)
- any limitations/restrictions from specifications that apply to the **EAGLE** implementation
- other information as appropriate

Applique

ANSI ATM

The **ANSI ATM** hardware consists of an **AATM** applique connected to an **HCAP** or **HCAP**-T main assembly. The **AATM** hardware provides the following functionality:

- support for the **DS1**, **ATM**, and **AAL5CP** layers of the **ATM** high-speed signaling link protocol stack as indicated in Figure C-1.
- **DS1** Layer support
  - generate **DS1** signals
  - support for **DS1** defect reporting:
    - **LOS**
    - LOF
    - LCD
    - In-band **AIS** signals
  - support for loopback testing at the **DS1** level
  - support for **DS1** performance measurements and performance monitoring
- **ATM** Layer support
  - idle cell insertion/removal
  - provide adequate indications of **ATM** layer errors:
    - invalid **ATM** header patterns
    - unsupported **VPI/VCI** combinations
    - unsupported **PTI** values
    - cells discarded due to header error control
    - out of cell delineation anomalies
  - header error control field to be automatically inserted/checked by the hardware
  - **CLP** field of cells received is made available to software
  - ability to **DMA** received cells directly to **DIMM** receive buffers
  - ability to **DMA** cells to transmit directly from **DIMM** transmit buffers
  - needs to support interleaved transmit/reception of data from different **VPI/VCI** combinations, or from **OAM** F5 flows as opposed to user data flows, these need to each be passed to higher layers using different queues or data structures

   - congestion indications for cells are made available to software; software can set the congestion indications for outbound traffic.
- **OAM** F5 cell support
   - only end to End **OAM** F5 cells for a **VCC** need to be supported
   - shall support generation (outbound) and processing (inbound) of **OAM** cell types for **VCC** F5 flows
   - shall indicate reception of these cells in a distinct manner from user data cells
   - provide **CRC**-10 checking/generation for these frames
- **AAL5CP** Layer support
   - perform the segmentation/reassembly required for user data cells and ability to pass user data to/from the **SSCOP** in an efficient manner (whether this is via some linked list of **ATM** cells that together make up 1 **AAL5CP**_PDU, or via regrouping **ATM** cells as they arrive into 1 continuous **AAL5CP**_PDU is implementation dependent).
   - provide **CRC**-32 generation/checking for **AAL5CP**_PDUs
   - should stuff outbound **AAL5CP**_PDUs with 0 in the **CPI** field
   - appropriate error checking and indications for errors
      - **CRC** errors
      - Length errors
      - CPI errors
   - some fields of the **AAL5CP**_PDU need to be passed to/from the higher layers
      - **UU**
      - CLP
      - Congestion indication

E1 ATM

The **E1 ATM** hardware consists of an **E1 ATM** applique connected to an **HCAP** or **HCAP**-T main assembly. The **E1 ATM** hardware performs the same functions as the **ANSI ATM** hardware, with these exceptions:

- support for the **E1**, **ATM**, and **AAL5CP** layers of the **ATM** high-speed signaling link protocol stack as indicated in Figure C-5.
- **E1** layer support
   - Support **CRC**-4
   - Support Si and Sn insertion in **Channel** 0
   - Support **E1** defect reporting:
      - **LOS**
      - LOF
      - LCD
- **OAM** F5 cell support - only end-to-end **OAM** F5 cells for a **VCC** are required to be supported

E1 Overview

This section provides an overview of **E1**, its protocol and characteristics.

Frame Structure

E1 is a 2.048 Mbps interface. It has a frame structure of 256 bits that is repeated at a rate of 8 **KHz**. The 256-bit frame is broken into 32 eight-bit time timeslots, numbered 0 to 31, as shown in Figure C-6. Timeslots can also be referred to as channels.

Figure C-6 E1 Frame Structure

align frame	Si 0 0 1 1 0 1 1	timeslot 1	timeslot 2	....	timeslot 30	timeslot 31
non-align frame	Si 1 A SnSnSnSnSn	timeslot 1	timeslot 2	....	timeslot 30	timeslot 31
align frame	Si 0 0 1 1 0 1 1	timeslot 1	timeslot 2	....	timeslot 30	timeslot 31
non-align frame	Si 1 A SnSnSnSnSn	timeslot 1	timeslot 2	....	timeslot 30	timeslot 31

Si - International Usage Spare Bit
Sn - National Usage Spare Bit
A - Alarm Bit

Timeslot 0

Timeslot 0 is used for frame alignment and **CRC** functions. Alternating frames contain the Frame Alignment Signal (**FAS**), X0011011, where X is supplied from the International Usage Spare Bit information (Si). Frames without the **FAS** carry Si, **Alarm**, and Sn information. Bit 1 is set to 1 to prevent accidental emulation of the **FAS**.

Si is reserved for international usage. **CRC**-4 specified below is one specific use. If no use is specified, Si should be set to 1. Sn is a 5-bit field (value 0 – 31). 'A' is an alarm bit. If set, it indicates a remote alarm indication.

CRC-4

A **CRC**-4 multi-frame structure is shown in Figure C-7. **CRC**-4 uses timeslot 0 primarily to aid in frame alignment validation but can be used to monitor error performance as well. A **CRC** multi-frame consists of timeslot 0 information from 16 consecutive frames. Each **CRC**-4 multi-frame is divided into 2 eight-frame sub-multi-frames (**SMF**).

Bit 1 is used to carry 3 different pieces of information:

- A multi-frame alignment word is a repeating 6-bit code (001011) that is located in frames 1,3,5,7,9, and 11.
- A 4-bit **CRC** code word (C1, C2, C3, C4), which is a data check on the previous 8 **E1** frames. The check covers the data for all 32 timeslots. (8 frames * 256 bits/frame = 2048 bits) Each **SMF** has its own code word. The code word for **SMF** I is in frames 0, 2, 4 and 6. The code word for **SMF II** is in frames 8, 10, 12, and 14.
- E (**CRC**-4 Error indication) bits, present in frames 13 and 15.

The **Alarm** Indication Signal is received in **Channel** 0, Bit 3 of the non-alignment frame. If this bit is set, it indicates a Remote **Alarm** Indication. As with the **ANSI ATM**, this condition is ignored.

Bits 2 through 8 follow the standard **E1** frame structure.

If **CRC**-4 in on, the provisioned Si information is not used. Instead, bit 0 is used for **CRC4** information, **CRC4** error reporting, and for multiframe alignment (see Figure C-7).

Figure C-7 CRC-4 Multiframe Structure

Timeslot 0

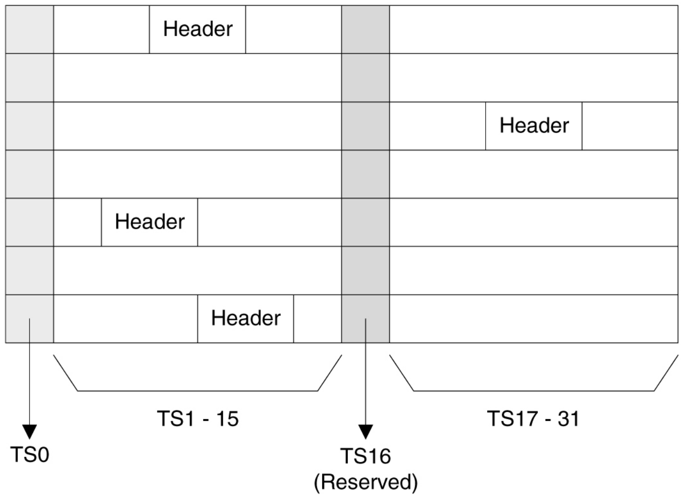
Frame 0	C1	0	0	1	1	0	1	1	Sub Multi-Frame I
Frame 1	0	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 2	C2	0	0	1	1	0	1	1	
Frame 3	0	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 4	C3	0	0	1	1	0	1	1	
Frame 5	1	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 6	C4	0	0	1	1	0	1	1	
Frame 7	0	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 8	C1	0	0	1	1	0	1	1	Sub Multi-Frame II
Frame 9	1	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 10	C2	0	0	1	1	0	1	1	
Frame 11	1	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 12	C3	0	0	1	1	0	1	1	
Frame 13	E	1	A	Sn	Sn	Sn	Sn	Sn	
Frame 14	C4	0	0	1	1	0	1	1	
Frame 15	E	1	A	Sn	Sn	Sn	Sn	Sn	

E - CRC-4 Error Indication Bits
C1 to C4 - Cyclic Redundancy Check 4 bits
Sn - National Spare Bits
A - Remote Alarm Indication

ATM Mapping into E1

Data channels 1 – 15 and 17 - 31 carries the data for a single **ATM** channel, as shown in Figure C-8. Note that the **ATM** cell size does not map directly over the **E1** frame format, so the **ATM** cell can start in any data channel. The data is octet-aligned.

Figure C-8 ATM Cell Mapping into E1 Frames



ATM Driver

The **ATM** driver is a software module, residing as part of the **ATMANSI** or **ATMITU** applications, that provides the code required to interface between the **AATM** hardware and the **SSCOP** layer and **ATM Layer Management** interfaces. The primary functions of the driver include:

- initialization and control of the **AATM** hardware
- interface between **AATM** hardware signals and data structures and the relevant messages/data to/from the **SSCOP** and **ATM Layer Management** layers
- provide the **DIMM** buffer management interface required for the **AATM** hardware for user data received and transmitted (that is, provide free receive buffer lists for the **AATM** hardware after grabbing buffers from **DIMM** mgmt, provide information detailing where to transmit user data from, etc.)
- some of the functions listed above in the **AATM** hardware section (such as providing separate 'receive channels' for **OAM** F5 vs. user data cells to/from higher levels) may actually be performed in this layer based on the actual **ATM** hardware solution selected
- the only type of **AAL** service needed is for **AAL** Type 5 (**AAL5**)
- the **AATM** hardware and **ATM** driver together make up the common part of the **SAAL** layer, also known as the **Common Part Convergence Sublayer** (**CPCS**) or **AAL5CP**, when the **AAL** type in question is **AAL5**.

E1 ATM Driver

The **E1 ATM** driver is a software module that provides the interface between the **E1 ATM** hardware, the **SSCOP** layer, and **ATM Layer Management** Module. The **E1 ATM** driver exists only in the **ATMITU** application. The basic structure is based upon the **ANSI ATM** driver present in the **ATMANSI** application. The primary changes to the existing **ANSI ATM** driver include:

- initialization and control of the new **E1 ATM** appliqué.
- remove **T1** support of 4 Kbps data link (**BOCs**, including performance reports and **T1** loopback tests)

- verify correct **E1 ATM** appliqué is installed and reboot if not

SSCOP

The primary task of the **SSCOP** (**Service Specific Connection Oriented Protocol**) is to provide assured data delivery between **AAL** connection endpoints. The **SSCOP** is 1 of 2 parts (the other being the **SSCF**) of the Service Specific part of the **SAAL** layer (also known as the **SSCS**, the **Service Specific Convergence Sublayer** of the **SAAL**). The other part of the **SAAL** Layer is the **CPCS** (which was just mentioned in the **ATM** driver). Breaking the **SSCS** into 2 sublayers allows a common connection oriented protocol with error recovery (the **SSCOP**) to provide a generic reliable data transfer service for different **AAL** interfaces defined by different **SSCF** layers. The primary functions of the **SSCOP** layer include:

- transfer of user data with sequence integrity
- error correction by selective retransmission
- flow control
- connection control
- error reporting to layer management
- connection maintenance in the prolonged absence of data transfer
- local data retrieval by the user of the **SSCOP**
- error detection of protocol control information
- status reporting

SSCF

The primary task of the **SSCF** (**Service Specific Coordination Function**) is to map the services provided by the lower layers of the **SAAL** to the needs of a specific higher layer user. For the **ATM** high-speed signaling link, the higher layer user is the **MTP**-3 protocol.

- maps signals/primitives from **MTP**-3 (**SSCF** user) to **SSCOP**, and vice versa.
- performs local retrieve function, required by the changeover order.
- flow control on transmit direction (**SSCF** notifies the user of congestion levels)
- maintains and controls the link status
- generates necessary reports to **ATM Layer Management** (primarily the cause for the release of the **SSCOP** connection)
- implements some **SSCF** to **SSCF**, peer to peer messages primarily related to connection establishment and release
- controls local and remote processor outage and recovery
- controls the alignment procedure

For an **E1 ATM** high-speed signaling link, the link proving default values are significantly different compared to an **ANSI ATM** high-speed signaling link. Table C-1 illustrates the different link proving values.

Table C-1 Link Proving Differences Between ITU and ANSI

CHG-ATM-LPS Parameter Name	Description	**E1 ATM** Default Values	**ANSI ATM** Default Values
N1	Number of **PDUs** sent during link proving	1000	64552
TmrT2	Time to attempt link proving	30 sec	120 sec
maxnrp	Maximum number of retransmitted **PDUs** during proving	0	1
TmrT3	Time between proving **PDUs**	925 sec	925 sec

The time required for normal **ANSI** proving is approximately 60 seconds (925 µsec/pdu * 64552 **PDUs** = 60 seconds). This time is greater than `TmrT2` value for an **E1 ATM** high-speed signaling link (30 seconds), so a link with **E1 ATM** defaults would have gone out of service before a link with **ANSI ATM** defaults finishes proving. Thus, great care must be taken to ensure that compatible proving numbers are assigned to a signaling link.

ATM and SAAL Layer Management Interfaces

The primary task of the **ATM** and **SAAL** layer management layers is to map requests and indications between the system management for the **EAGLE** and the individual **ATM**, **AAL5CP**, **SSCOP**, and **SSCF** layers. This functionality is actually achieved using two management modules, which both interface to the system management.

ATM Layer Management

ATM layer management is achieved with the **ATMM** (**ATM** layer management module). The **ATMM** provides a supporting role for system management functions which include fault, performance, configuration, security and resource management functions. It is the job of the system management to coordinate with different layers locally to perform all tasks associated with these functions. The **ATMM** entity uses two types of interactions with the **ATM** entity to perform its functions. The first type of interaction is for the exchange of info between the **ATM** and **ATMM** entity. The second type of interaction is for peer to peer communication between **ATMM** entities (between the two nodes on both ends of the high-speed signaling link). This second interaction is achieved by sending and receiving and processing **OAM** F5 cells in the **ATM** high-speed signaling link implementation. The primary functions provided by the **ATMM** for an **ANSI ATM** high-speed signaling link include:

- **OAM** F5 fault management: includes alarm surveillance, loopback using **OAM** cells, and continuity check
- **OAM** F5 performance management: includes activation and deactivation of performance monitoring, forward and backward monitoring and reporting of performance to system management.

> **Note:**
>
> The general **ATMM** layer is capable of performing performance management functionality. The **ATMM** layer implemented by **ATM** high-speed signaling link does not support this capability.

The primary functions provided by the **ATMM** for an **E1 ATM** high-speed signaling link include only **OAM** F5 fault management: loopback by **OAM** cells. All other forms of **OAM** F5 management and **OAM** F5 performance management are not supported.

SAAL Layer Management

The **SAAL** layer management includes interfaces to and from **AAL5CP**, **SSCOP**, **SSCF**, and system management. **SAAL** layer management supports the following functions:

- error processing for these layers
- error monitoring for in-service links
- detection of excessive time with no credit
- detection of closely spaced **SSCOP** recoveries
- measurements
- duration of presence in the in-service state
- signaling link failures
- signaling link restoration
- handling of processor outage conditions
- management of signaling link proving

C.3 ATM High-Speed Signaling Link Testing Capability

Local Loopback Support

There are five link testing capabilities for an **ATM** high-speed signaling link. All five of these tests can be used for an **ANSI ATM** high-speed signaling link; three of these tests can be used for an **E1 ATM** high-speed signaling link. Table C-2 gives a description of each test and shows which the type of **ATM** high-speed signaling link each test can be used. Figure C-9 and Figure C-10 show diagrams of each test.

Table C-2 ATM High-Speed Signaling Link Loopback Support

Loopback Type	ANSI ATM High-Speed Signaling Link	E1 High-Speed High-Speed Signaling Link	When can the Loopback Test be Performed	How does the Loopback test Work	What is Tested (Assume Near End Unless Specified)
SLTC	Yes	Yes	When the link is in service and activated	**MTP**-3 exchanges **SLTM**/**SLTA** messages with remote **MTP**-3. Appears as normal **MSU** traffic to **SSCF** and **SSCOP**.	**MTP**-3 layer, **ATM** protocol stack (near end and far end), and wire
OAM	Yes	Yes	When the link is connected to a remote **STP**. The state of the link is either activated or deactivated.	**ATM** driver exchanges **OAM** F5 Loopback cells with remote **ATM** driver. One **OAM** cell per request with a maximum of three attempts made.	**ATM** driver (near end and far end) and wire
LXVR	Yes	Yes	When the link is deactivated.	**MTP**-3 attempts to align link. If alignment fails, test fails. Appears as normal alignment request to **SSCF** and **SSCOP**.	**SSCF**, **SSCOP**, **ATM** driver and **T1** hardware (for an **ANSI ATM** high-speed link) or **E1** hardware (for an **E1 ATM** high-speed signaling link) on near end
Payload	Yes	No	When the link is deactivated, connected to remote **STP** and no Yellow **Alarm BOC** is being transmitted.	**MTP**-3 attempts to align link. If alignment fails, test fails. Appears as normal alignment request to **SSCF** and **SSCOP**.	**SSCF**, **SSCOP**, **ATM** driver (near end only) and **T1** hardware (near end and far end) and wire

Table C-2 (Cont.) ATM High-Speed Signaling Link Loopback Support

Loopback Type	ANSI ATM High-Speed Signaling Link	E1 High-Speed High-Speed Signaling Link	When can the Loopback Test be Performed	How does the Loopback test Work	What is Tested (Assume Near End Unless Specified)
Line	Yes	No	When the link is deactivated and connected to remote **STP** and no Yellow **Alarm BOC** is being transmitted.	**MTP**-3 attempts to align link. If alignment fails, test fails. Appears as normal alignment request to **SSCF** and **SSCOP**.	**SSCF**, **SSCOP**, **ATM** driver (near end only) and **T1** hardware (near end and far end) and wire

Figure C-9   ANSI ATM High-Speed Signaling Link Loopback Support

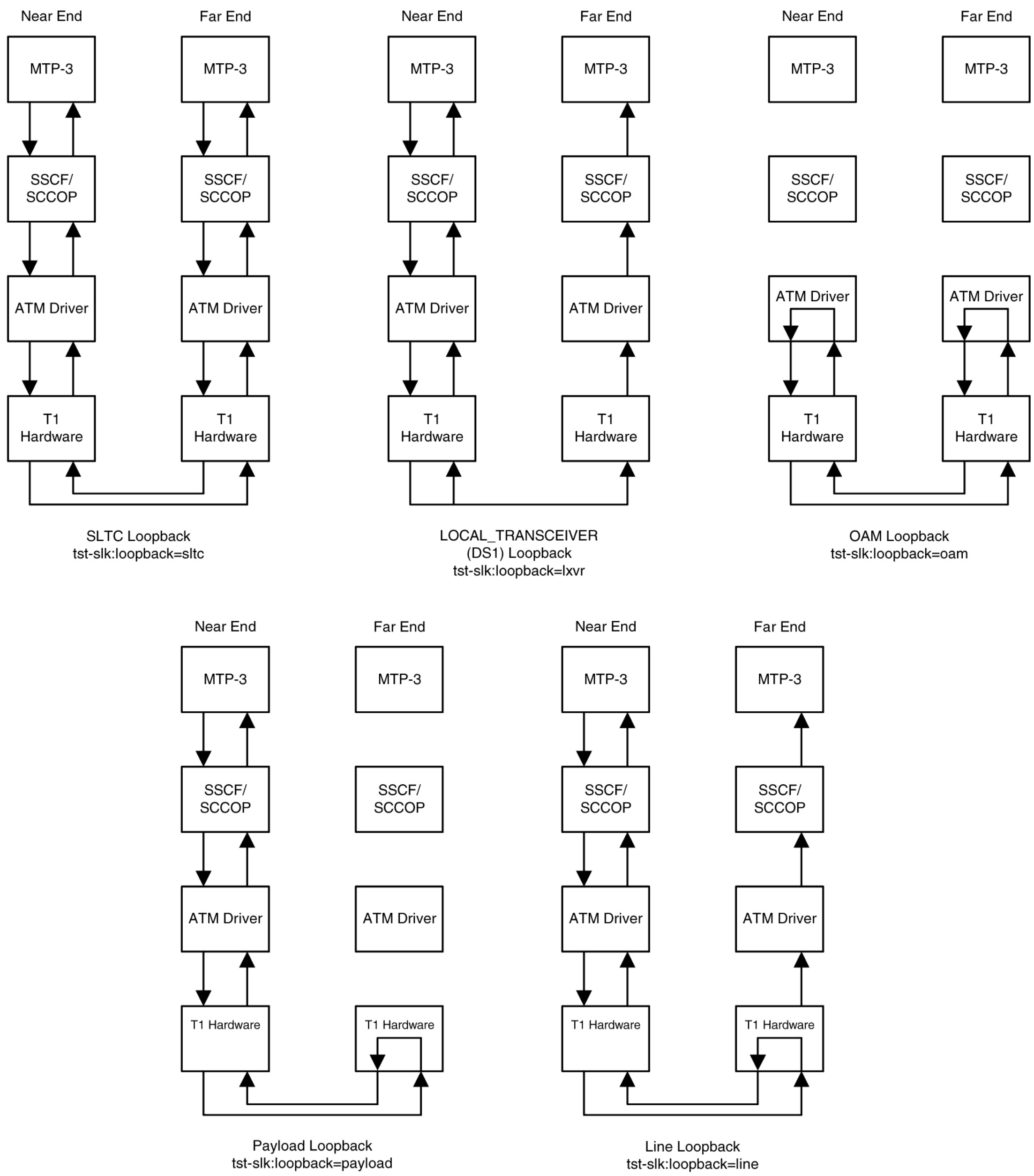
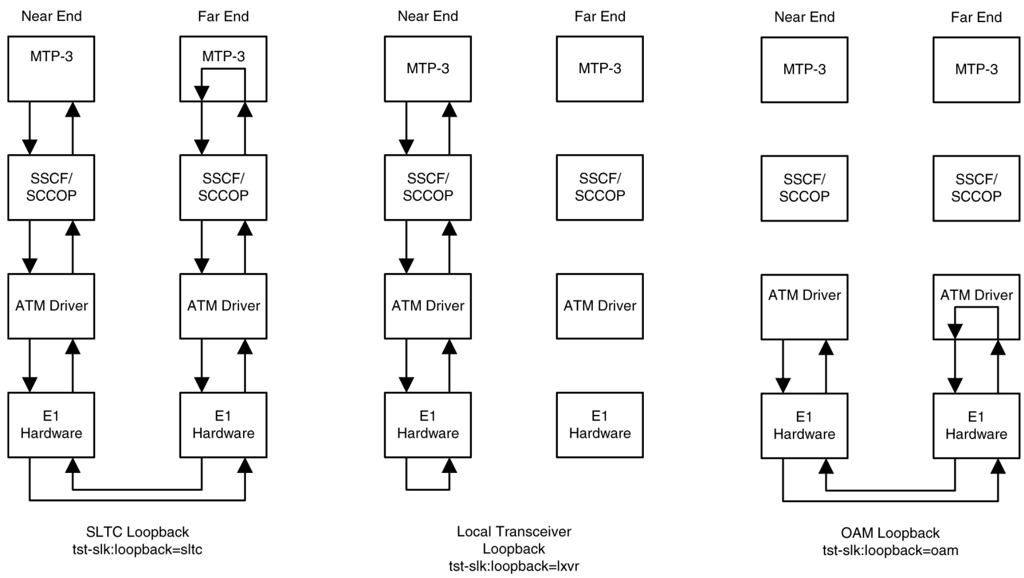


Figure C-10   E1 ATM High-Speed Signaling Link Loopback Support



Remote Loopback Support

The **LIM** containing the **ATM** high-speed signaling link must provide remote loopback support so that the **EAGLE** 5 **ISS** can act as the far end **STP** as shown in Figure C-9 or Figure C-10. The support provided for **ATM** high-speed signaling link cards is identical to low-speed signaling link cards by providing the same initialization and detection capabilities.

- **initialization** - The **MTP**-3 layer, independent of hardware interface, allows remote loopbacks when the link is deactivated. Upon receiving a bit-oriented code for a line or payload loopback, the **ATM** high-speed signaling link reprograms the **AATM** hardware if **MTP**-3 has determined a remote loopback is allowed.
- **detection** - Every 500 ms, the hardware is read to determine if remote loopback is in progress and the maintenance block is updated. This generates a **UAM** to the local node. For **DS1** links, an **AATM** hardware register is read to determine if the **T1** layer is currently configured for remote loopback.

Link Status Logging Capability

The Enhanced **Link** Diagnostics capability stores link status information. The link status information is divided into 2 categories: service data and alignment data. Currently, each logging routine can store up to 69 events, all of which can be displayed using the `rept-stat-slk` command. The service data and alignment data categories are described in the following sections.

Service Data Category

Service events and their timestamps are buffered during transitions between the In-Service/Data Transfer Ready states and all other states. This buffer contains a history of the link failure reasons (as seen from Level 2's point of view) and the subsequent realignments. Each entry in the buffer is either the link failure reason and time, or the time the link came back in service. Table C-3 provides a list of all high-speed signaling link failure reasons, however, not all of these failures will show up in the service data.

Several types of failure that are recognized by Level 3 (like **Changeover** Order Received or Failed **SLT**) are mapped to a Stop Commanded event at Level 2. If the history indicates the link did not realign after the failure, the alignment data buffer shows the reason the link was unable to be realigned.

The service data history contains only the high-speed signaling link failure reason as seen by Level 2. As highlighted above, there actual failure reason can be hidden from the Level 2 Service Data if it is an event that is detected by level 3. For example, there are many reasons why Level 3 sends a Stop command to Level 2, such as link deactivated by user, changeover order received, false link congestion, etc. Therefore, the service data should only be used as a guide in determining a link failure.

Table C-3 High-Speed Signaling Link vs. Low-Speed Signaling Link Unavailability Reasons by Priority

High-Speed Signaling Link Unavailability Reason	Low-Speed Signaling Link Unavailability Reason
Remote Loopback	Remote Loopback
LOS	
LOF	
LCD	
Too Many Interrupts	Too Many Interrupts
	Stopped Receiving Data
ISERM threshold exceeded	
	SUERM
Remote Out of Service	
Remote Protocol Error	
Remote Management Initiated	
Remote Processor Outage	
Local Processor Outage	
Timer_No_Credit expired	
Timer_No_Response expired	
	T1 expired(ready, not ready)
	T3 expired
	T2 expired
	Exceeded Proving Period Count
	SIO received
	SIN received
	SIE received
	SIOS received
	SIPO received
	RC/**BSNR** link failure
	RC/**FIBR** link failure
	T6 expired
	T7 expired

Table C-3 (Cont.) High-Speed Signaling Link vs. Low-Speed Signaling Link Unavailability Reasons by Priority

High-Speed Signaling Link Unavailability Reason	Low-Speed Signaling Link Unavailability Reason
COO Received	**COO** Received
False **SLK** Congestion	False **SLK** Congestion
SLK Restart Delayed	**SLK** Restart Delayed
Far End Loopback	Far End Loopback
Link Not Aligned (default)	**Link** Not Aligned (default)
Remote Blocked	Remote Blocked
Local Blocked	Local Blocked
Remote Inhibited	Remote Inhibited
Local Inhibited	Local Inhibited

Alignment Data Category

Alignment events are buffered at all times when link is not in service. Only the first unique occurrence of an event and its timestamp is buffered. High-speed signaling link alignment events are divided into:

- **SSCOP**, **SSCF** and **MAAL** state transitions
- **SSCOP** and **SSCF** transmitted **PDUs**
- **SSCOP** and **SSCF** received **PDUs**
- Special level 1 events.

Table C-4, Table C-5, and Table C-6 list all the possible alignment events sorted by event type.

Table C-4 High-Speed Signaling Link State Transition Alignment Events

SSCOP	SSCF	MAAL
Idle	**OOS** Idle	**OOS**
Outgoing Conn. Pending	**OOS ODP**	Alignment
Incoming Conn. Pending	Alignment Idle	Proving
Outgoing Disc. Pending	Alignment **OCP**	Aligned/Ready
Outgoing Resync Pending	Alignment **ODP**	In Service
Incoming Resync Pending	Proving Data Transfer Ready	
Outgoing Recovery Pending	Aligned/Ready Data Transfer Ready	
Recovery Response Pending	In Service/Data Transfer Ready	
Incoming Recovery Pending		
Data Transfer Ready		

Table C-5 High-Speed Signaling Link Transmitted/Received Alignment PDUs

SSCOP	SSCF
BGN	Out of Service
BGAK	Processor Outage
END	In Service
ENDAK	Normal
RS	Emergency
RSAK	Alignment Not Successful
BGREJ	Mgmt Initiated
SD	Protocol Error
ER	Proving Not Successful
POLL	
STAT	
USTAT	
UD	
MD	
ERAK	

Table C-6 High-Speed Signaling Link Special Level 1 Alignment Events

Special Events
LCD
LCD Cleared
LOF
LOF Cleared
LOS
LOS Cleared
Too Many Interrupts
Stop Commanded

Display of Buffered Data

The buffered data are displayed using the `rept-stat-slk` command. All events are buffered with the day and time of the event. The buffered timestamp is displayed in a day of year and time of day format (**YY-MM-DD HH**:**MM**:**SS**.sss). The time of day and day of year are passed to the **LIM** card when polling for the maintenance block. A timer on the **LIM** card, with a 5 millisecond granularity, provides the millisecond portion of the time displayed. The user has the ability to request either alignment data, service data or both be displayed. A maximum of 69 service and/or alignment events are displayed. However, the user has the ability to display only the last 10 alignment events. See the *Commands Manual* for a description of the `rept-stat-slk` command.

C.4 Large MSUs

As shown in Figure C-3, a general purpose implementation of the **ATM** high-speed signaling link protocol stack would allow for large **MSUs** to be transferred across an **ANSI** or **E1 ATM** high-speed signaling link. The **SSCOP** layer can handle user data from **SSCF** that is up to 4096 bytes long. Since the **SSCF** layer does not add a trailer to **MTP3** data, the **ATM** protocol stack is able to transfer **MTP3** data packets up to 4096 bytes. When the **SSCOP** trailer is added, 4100 bytes of user data are handed to the **AAL5CP** layer.

These **MSU** sizes are much larger than the **MTP3** data size currently supported by a low-speed signaling link. Currently, the largest **MSU** transferred on a low-speed signaling link is 279 bytes (2 flag bytes, 3 level 2 header bytes, 2 **FCS** bytes, and 272 bytes of **MTP3** data). A large **MSU** is any **MSU** that contains 273 to 4096 bytes of **MTP** data.

The **ATM** high-speed signaling link (**ANSI** or **E1**) does not support large **MSUs**. Either **UIM** 1172 or 1173 is generated when a large **MSU** is received. See the UIMs section for more information on these **UIMs**.

C.5 Unsolicited Messages

There are two types of unsolicited messages that are generated, alarm messages (**UAMs**) and information messages (**UIMs**).

Link Unavailability UAMs

The signaling link **UAM** format includes a **CLASS** output. This identifies the corresponding link as either an **MTP2** or **SAAL** link class (the **SAAL** link class is used for high-speed signaling links).

Example:

```
0044.0200    SLK 1201,A sp1        RCVRY-LKF: link available
             SLC=01   FECLLI=A1234567890                   CLASS=SAAL

0044.0200    SLK 1202,A sp2        RCVRY-LKF: link available
             SLC=01   FECLLI=A1234567890                   CLASS=MTP2
```

Table C-3 provides a summary of high-speed signaling link and low-speed signaling link unavailable reasons listed from highest priority to lowest.

Table C-7 shows the **UAMs** that correspond link failures on an high-speed signaling link. All signaling link alarms have a severity level of major, except for **UAM** 200, which shows that the link failure has been cleared. All alarms are output to the **Link** Maintenance output group.

Table C-7 Signaling Link Unsolicited Alarm Messages

Link Failure	UAM Number	UAM Text
Recovery: **Link** Available	0200	**RCVRY**-**LKF**: link available

Table C-7 (Cont.) Signaling Link Unsolicited Alarm Messages

Link Failure	UAM Number	UAM Text
Failure: Remote **NE** Loopback	0201	**REPT**-**LKF**: remote **NE** loopback
Failure: Hardware Problems	0202	**REPT**-**LKF**: **HWP** - too many link interrupts
Failure: Failed Remote **FE** Loopback	0202	**REPT**-**LKF**: remote **FE** loopback
Failure: **MTP3 Changeover** Order (**COO**) Message Received	0218	**REPT**-**LKF**: **COO** - rcvd changeover order
Management Inhibit: Remote	0234	**REPT**-**LKF**: **RMI** remote inhibited
Management Inhibit: Local	0235	**REPT**-**LINK**-**MGTINH**: local inhibited
Failure: Unresolved - Default failure reason	0236	**REPT**-**LKF**: not aligned
Failure: False Congestion Restart	0236	**REPT**-**LKF**: false congestion restart
Failure: **MTP Link** Restart Delayed	0236	**REPT**-**LKF**: **MTP** link restart delayed
Excessive Duration of Far End Receiving Congestion	0237	**REPT**-**LKF**: **LM** Timer **NO-CREDIT** expired
Excessive Delay of Acknowledgment	0238	**REPT**-**LKF**: **XDA** - Timer **NO-RESPONSE** expired
Local Processor Outage(management initiated)	0239	**REPT**-**LKF**: **MBL** - local processor outage
SSCF Remote Release: Remote Processor Outage	0240	**REPT**-**LKF**: rcvd **SSCOP END**-proc. outage
SSCF Remote Release: Out of Service	0241	**REPT**-**LKF**: rcvd **SSCOP END**-out of service
SSCF Remote Release: Protocol Error	0242	**REPT**-**LKF**: rcvd **SSCOP END**-protocol error
SSCF Remote Release: Management Initiated	0243	**REPT**-**LKF**: rcvd **SSCOP END**-mgmnt initiated
Facility Outage - **DS1** Loss of Signal failure	0244	**REPT**-**LKF**: **FAC** - **DS1 LOS** failure
Facility Outage - **DS1** Loss of Frame failure	0245	**REPT**-**LKF**: **FAC** - **DS1 LOF** failure
Facility Outage - **DS1** Loss of Cell Delineation failure	0246	**REPT**-**LKF**: **FAC** - **DS1 LCD** failure
Excessive In Service Error Rate	0247	**REPT**-**LKF**: **XER** - **ISERM** threshold exceeded

UIMs

There are two types **UIMs** generated with **ATM** high-speed signaling links, **UIMs** for large **MSUs** and **UIMs** for the loopback tests. **UIMs** 1172 and 1173 are generated for **MTP MSUs** (1172) and **SCCP MSUs** (1173).

The large **MSUs** are discarded at the receiving **ATM** high-speed signaling link rather than the outbound link.

UIM 1172 Example

```
0018.1172    CARD 1103    INFO  REPT-OVSZMSG: MTP MSU too large to
route.
             LEN=279  SIO=03  DPC=001-001-001  OPC=002-002-002
             LSN=A1234567
    Report Date: 97-10-30  Time: 16:27:19
```

UIM 1173 Example

```
0018.1173    CARD 1103    INFO  REPT-OVSZMSG: SCCP MSU too large to
route.
             LEN=279  SIO=03  DPC=001-001-001  OPC=002-002-002  MSG
TYPE=09
             CDPA:  AI=8B  PC=003-003-003  SSN=005  TT=250
ADDR=1234567890
             CGPA:  AI=8B  PC=004-004-004  SSN=006  TT=251
ADDR=0123456789
             LSN=A1234567
    Report Date: 97-10-30  Time: 16:27:19
```

The **UIMs** shown in Table C-8 are generated when loopback tests performed on the **ATM** high-speed signaling link are completed.

Table C-8 Loopback Test UIMs

UIM #	Severity	Message Text	UIM is Generated When ...
1156	None	Loopback success	loopback test passes.
1157	None	Loopback failed	loopback test failed.
1158	None	Loopback aborted	request to activate link is received while running a loopback.
1159	None	Loopback in progress	loopback request received while the same loopback test is already in progress.

Table C-8 (Cont.) Loopback Test UIMs

UIM #	Severity	Message Text	UIM is Generated When ...
1170	None	Loopback prevented	loopback setup was not performed because the specified type of loopback requires a **BOC** to be transmitted and this function was prevented from transmitting a **BOC**.
1171	None	Loopback invalid	loopback setup was not performed because invalid parameters were provided.

C.6 ATM High-Speed Signaling Link Configuration

An **ATM** high-speed signaling link is configured using these commands:

- `ent-card` - Used to add the either the **ANSIATM** or **E1ATMLIMs**
- `ent-slk` - Used to add the signaling link
- `chg-atm-lps` - Used to change the **ATM** signaling link parameters. The **ATM** signaling link parameters control the behavior of the **ATM** high-speed signaling links. These parameters are not configured with the `ent-slk` command and are assigned default values when the **ATM** high-speed signaling link is added to the database.

To configure an **ATM** high-speed signaling link, perform these procedures:

- Adding an ATM High-Speed LIM
- Adding an ATM High-Speed Signaling Link
- Changing an ATM High-Speed Signaling Link Parameter Set .

Procedures for configuring the linksets and routes, and for removing **SS7** signaling links (which includes **ATM** high-speed signaling links), are contained in SS7 Configuration. The procedure for removing the **LIM** containing the **ATM** high-speed signaling link is contained in the *Database Administration Manual - System Management*. These procedures contain no information that is specific to **ATM** high-speed signaling links, therefore, are not included in this appendix.

The procedures contained in this appendix use a variety of commands. If more information on these commands is needed, go to the *Commands Manual* to find the required information.

C.7 Adding an ATM High-Speed LIM

This procedure is used to add an ATM high-speed LIM to the database using the `ent-card` command.

The `ent-card` command uses these parameters.

`:loc` – The location of the card being added to the database.

`:type` – The type of card being added to the database.

`:appl` – The application software that is assigned to the card.

`:force` – If the global title translation feature is on, the `force=yes` parameter allows the **LIM** to be added to the database even if the current **SCCP** transactions-per-second threshold is unable to support the additional **SCCP** transaction-per-second capacity created by adding the **LIM**. This parameter is obsolete and is no longer used.

> **Note:**
>
> As of Release 46.6, E5-ATM refers to the E5-ATM-B (P/N 870-2972-xx) card.

Table C-9 shows the valid card type (`type`) and card application (`appl`) combinations for the **ATM** high-speed **LIM**s being added to the database and the names and part numbers of the hardware. This can be used to verify that the **ATM** high-speed **LIM** being added to the database matches the card physically installed in the **EAGLE**. See the Determining the Number of High-Speed and Low-Speed Signaling Links section for information on the maximum number of **ATM** high-speed **LIMs** that can be configured in the database.

Table C-9 ATM High-Speed LIM Card Type and Card Application Combinations

Card Name	Part Number	Card Type (:type)	Application Type (:appl)
E5-ATM-B	870-2972-01	limatm lime1tam	atmansi atmitu

The shelf to which the card is to be added, must already be in the database. This can be verified with the `rtrv-shlf` command. If the shelf is not in the database, go to the Adding a Shelf procedure in the *Database Administration - System Management User's Guide* and add the shelf.

The examples in this procedure are used to add the cards shown in Table C-10 to the database.

Table C-10 Example Card Configuration

Card Type	Application	Card Location
limatm (E5-ATM)	atmansi	2207
lime1atm (E5-ATM)	atmitu	2205

> **Note:**
>
> If an E5-ATM is being added as the ATM high-speed LIM, verify the temperature alarm threshold settings for the E5-ATM card by performing the Changing the High-Capacity Card Temperature Alarm Thresholds procedure.

1. Display the cards in the database using the `rtrv-card` command.

   This is an example of the possible output.

```
rlghncxa03w 09-05-28 09:12:36 GMT EAGLE5 41.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1102   TSM       GLS
1113   GSPM      OAM
1114   TDM-A
1115   GSPM      OAM
1116   TDM-B
1117   MDAL
1201   LIMDS0    SS7ANSI  sp2         A    0   sp1         B    0
1203   LIMDS0    SS7ANSI  sp3         A    0
1204   LIMDS0    SS7ANSI  sp3         A    1
1206   LIMDS0    SS7ANSI  nsp3        A    1   nsp4        B    1
1301   DSM       VSCCP
1308   LIMDS0    SS7ANSI  sp6         A    1   sp7         B    0
1314   LIMDS0    SS7ANSI  sp7         A    1   sp5         B    1
```

   The cards should be distributed throughout the **EAGLE** for proper power distribution. Refer to *Installation Guide* for the shelf power distribution.

2. Using Table C-9 as a reference, verify that the card has been physically installed into the proper location.
   - If an E5-ATM card is not being provisioned in this procedure, continue the procedure with 7.
   - If an E5-ATM card is being provisioned in this procedure, continue the procedure with the next step.

3. Verify that HIPR2 cards are installed at card locations 9 and 10 in the shelf where the E5-ATM card will be installed. Enter this command..

   `rept-stat-gpl:gpl=hipr2`

   This is an example of the possible output.

```
rlghncxa03w 09-07-05 08:12:53 GMT  41.1.0
GPL        CARD      RUNNING           APPROVED      TRIAL
HIPR2      1109      126-002-000       126-002-000   126-003-000
HIPR2      1110      126-002-000       126-002-000   126-003-000
HIPR2      1209      126-002-000       126-002-000   126-003-000
HIPR2      1210      126-002-000       126-002-000   126-003-000
HIPR2      1309      126-002-000       126-002-000   126-003-000
HIPR2      1310      126-002-000       126-002-000   126-003-000
HIPR2      2109      126-002-000       126-002-000   126-003-000
HIPR2      2110      126-002-000       126-002-000   126-003-000
Command Completed
```

   If **HIPR2** cards are installed at card locations 9 and 10 in the shelf where the E5-ATM card will be installed, continue the procedure with 7.

If HIPR2 cards are not installed at card locations 9 and 10 in the shelf where the E5-ATM card will be installed, go to *Installation Guide* and install the HIPR2 cards. Once the HIPR2 cards have been installed, continue the procedure with 7.

4. If the card is an EPM-B based card (E5-ATM-B), enter the `rtrv-stpopts` command to verify whether or not the MFC option is on. If the card is not an EPM-B based card, continue the procedure with 5

   This is an example of the possible output.

```
rlghncxa03w 11-10-17 16:02:05 GMT EAGLE5 44.0.0
STP OPTIONS
---------------------------
MFC                     off
```

   The `rtrv-stpopts` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-stpopts` command, see the `rtrv-stpopts` command description in the *Commands User's Guide*.

   If the **MFC** option is off, perform the Configuring the MFC Option procedure in *Database Administration - System Management User's Guide* to turn on the MFC option.

   If the MFC option is on or the MFC Option procedure in *Database Administration - System Management User's Guide* was performed in this step, continue the procedure with 7.

5. The Fan feature must be turned on. If the fan feature is off, enter the `rtrv-feat` command to verify that the Fan feature is on.

   If the Fan feature is on, shown in the `rtrv-feat` output in this step, the `FAN` field should be set to `on`.

   The `rtrv-feat` command output contains other fields that are not used by this procedure. To see all fields displayed by the `rtrv-feat` command, see the `rtrv-feat` command description in *Commands User's Guide*.

   If the Fan feature is on, continue the procedure with 7.

   If the Fan feature is off, continue the procedure with 6.

6. Turn the Fan feature on by entering this command.

   `chg-feat:fan=on`

> **Note:**
>
> Once the Fan feature is turned on with the`chg-feat` command, it cannot be turned off.

When the `chg-feat` has successfully completed, this message appears.

```
rlghncxa03w 11-10-28 11:43:04 GMT EAGLE5 44.0.0
CHG-FEAT: MASP A - COMPLTD
```

7. Add the card using the `ent-card` command. For this example, enter these commands.

   `ent-card:loc=1318:type=limatm:appl=atmansi`

   `ent-card:loc=2101:type=lime1atm:appl=atmitu`

   `ent-card:loc=2207:type=limatm:appl=atmansi`

   `ent-card:loc=2205:type=lime1atm:appl=atmitu`

   When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-12 09:12:36 GMT  EAGLE5 36.0.0
ENT-CARD: MASP A - COMPLTD
```

8. Verify the changes using the `rtrv-card` command with the card location specified.

   For this example, enter these commands.

   `rtrv-card:loc=1318`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1318   LIMATM    ATMANSI
```

   `rtrv-card:loc=2101`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
2101   LIME1ATM  ATMITU
```

   `rtrv-card:loc=2207`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
2207   LIMATM    ATMANSI
```

   `rtrv-card:loc=2205`

This is an example of the possible output.

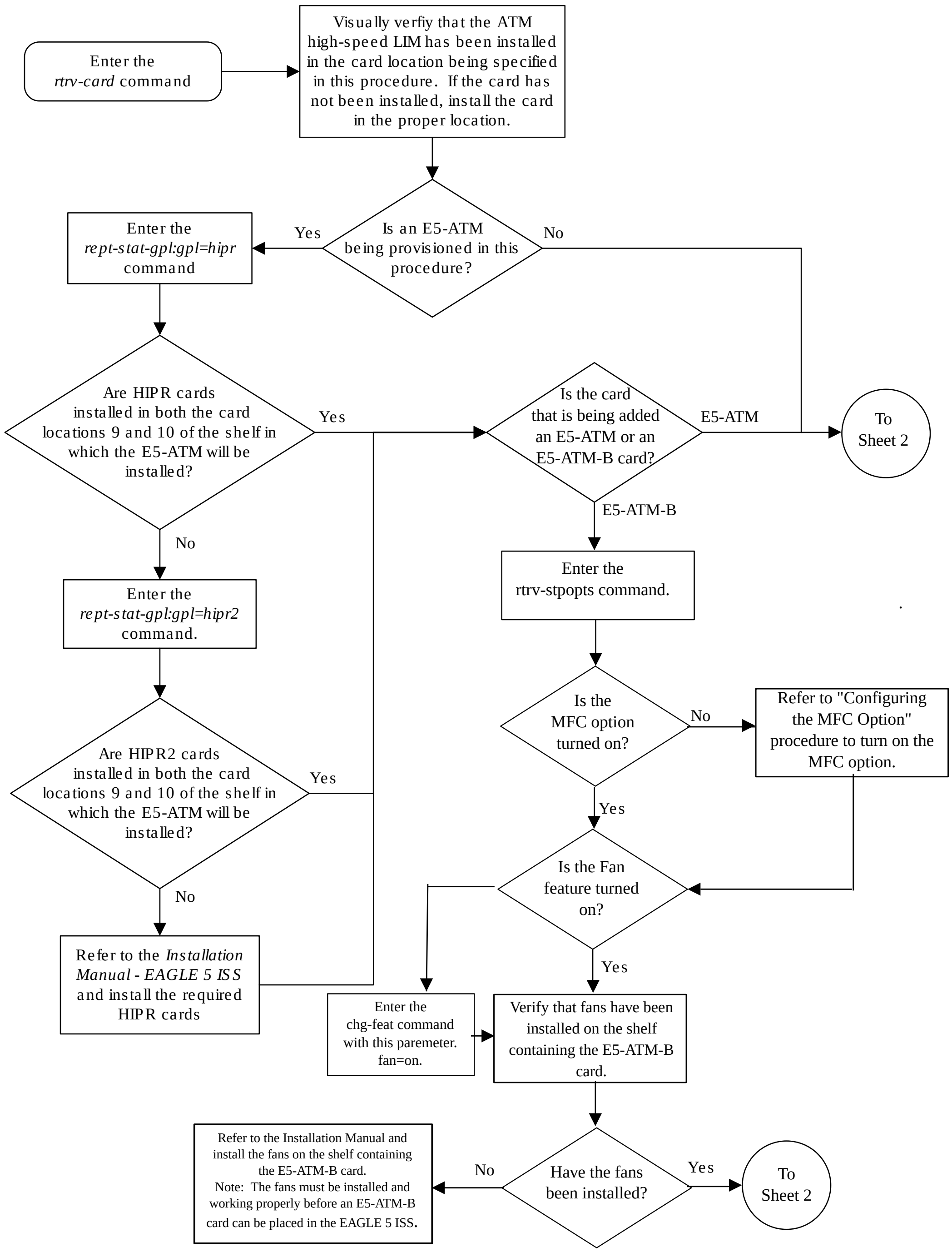
```
rlghncxa03w 06-10-28 09:12:36 GMT EAGLE5 36.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
2205   LIME1ATM  ATMITU
```

9. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

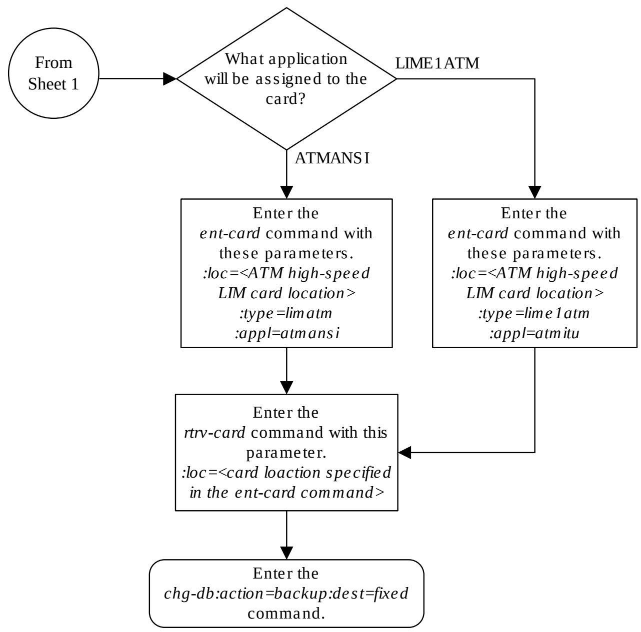
   These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure C-11 Adding an ATM High-Speed LIM



Sheet 1 of 2



Sheet 2 of 2

C.8 Changing the Three Links per E5-ATM-B Card Quantity

This procedure is used to increase the number of E5-ATM-Bs that can contain three signaling links. There is maximum of 250 E5-ATM-Bs that can contain three signaling links. The EAGLE contains a maximum of 250 card slots for signaling links.

Note:

As of Release 46.6, E5-ATM refers to the E5-ATM-B (P/N 870-2972-xx) card.

The `enable-ctrl-feat` command enables the Three Links per E5-ATM Card quantity, in groups of 5 E5-ATMs, by specifying the part number for the 3 Links per E5-ATM Card quantity and the Three Links per E5-ATM Card quantity's feature access key with these parameters:

`:fak` – The feature access key supplied by Oracle. The feature access key contains 13 alphanumeric characters and is not case sensitive. If you do not have the feature access key for the Three Links per E5-ATM Card quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

`:partnum` – The Oracle-issued part number for the Three Links per E5-ATM Card quantity shown in Table C-11.

Table C-11 3 Links per E5-ATM-B Card Quantities and Part Numbers

Part Number	3 Links per E5-ATM Card Quantity	Part Number	3 Links per E5-ATM Card Quantity
893039101	5	893039126	130
893039102	10	893039127	135
893039103	15	893039128	140
893039104	20	893039129	145
893039105	25	893039130	150
893039106	30	893039131	155
893039107	35	893039132	160
893039108	40	893039133	165
893039109	45	893039134	170
893039110	50	893039135	175
893039111	55	893039136	180
893039112	60	893039137	185
893039113	65	893039138	190
893039114	70	893039139	195
893039115	75	893039140	200
893039116	80	893039141	205
893039117	85	893039142	210
893039118	90	893039143	215
893039119	95	893039144	220
893039120	100	893039145	225
893039121	105	893039146	230
893039122	110	893039147	235
893039123	115	893039148	240
893039124	120	893039149	245
893039125	125	893039150	250

The `enable-ctrl-feat` command requires a valid serial number for the EAGLE to be configured in the database, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE is on-site, by using the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

> **Note:**
>
> To enter and lock the EAGLE's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Once the proxy point code quantity is enabled with the `enable-ctrl-feat` command, the proxy point code is also turned on. The `chg-ctrl-feat` command is not necessary to turn on the proxy point code quantity.

A 3 Links per E5-ATM quantity cannot be enabled for the first time if there are any ATM high-speed signaling links in the database whose VCI value is greater than 16383. These signaling links must be removed by performing the Removing an SS7 Signaling Link procedure. These signaling links can be added back to the database by performing the Adding an ATM High-Speed Signaling Link procedure. The VCI value for these signaling links must be 16383 or less. If a 3 Links per E5-ATM quantity is being increased from a currently enabled 3 Links per E5-ATM quantity, then there are no ATM high-speed signaling links in the database whose VCI value is greater than 16383.

1. Display the features that are enabled by entering the `rtrv-ctrl-feat` command.

   The following is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64
```

```
3 Links per E5-ATM Card   893039105  on      25

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

If a 3 Links per E5-ATM Card quantity is enabled, the entry `3 Links per E5-ATM Card` is shown in the `rtrv-ctrl-feat` output.

If a 3 Links per E5-ATM Card quantity is shown in the `rtrv-ctrl-feat` output and that quantity is 250, the new quantity cannot be enabled. This is the maximum number of E5-ATMs that can contain 3 signaling links.

If a 3 Links per E5-ATM Card quantity is shown in the `rtrv-ctrl-feat` output and that quantity is less than 250, continue the procedure with Oracle.

If a 3 Links per E5-ATM Card quantity is not shown in the `rtrv-ctrl-feat` output, continue the procedure with 2.

If the `rtrv-ctrl-feat` output in 1 shows any controlled features, continue the procedure with 6. If the `rtrv-ctrl-feat` output shows only the HC-MIM SLK Capacity feature with a quantity of 64, 2 through 5 must be performed.

2. Display the serial number in the database with the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
System serial number = <EAGLE serial number>

System serial number is not locked.
```

> **Note:**
>
> If the serial number is correct and locked, continue the procedure with6. If the serial number is correct but not locked, continue the procedure with5. If the serial number is not correct, but is locked, a 3 Links per E5-ATM quantity cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to My Oracle Support (MOS) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

3. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE’s correct serial number>`

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

4. Verify that the serial number entered in 3 was entered correctly using the `rtrv-serial-num` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
System serial number = <EAGLE correct serial number>

System serial number is not locked.
```

   If the serial number was not entered correctly, repeat 3 and 4 and re-enter the correct serial number.

5. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in 2, if the serial number shown in 2 is correct, or with the serial number shown in 4, if the serial number was changed in 3, and with the `lock=yes` parameter.

   For this example, enter this command.

   `ent-serial-num:serial=<EAGLE's serial number>:lock=yes`

   When this command has successfully completed, the following message should appear.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

6. Display the ATM high-speed signaling links by entering this command.

   `rtrv-slk:type=saal`

   This is an example of the possible output.

```
rlghncxa03w 10-12-19 21:16:37 GMT EAGLE5 43.0.0

                                 LP          ATM
LOC   LINK LSN          SLC TYPE      SET BPS     TSEL       VCI    VPI   LL
1303 A     lsnds0       1   LIMATM    1   1.544M LINE       5      0     0

                                 LP          ATM
E1ATM
LOC   LINK LSN          SLC TYPE      SET BPS     TSEL       VCI    VPI
CRC4 SI  SN
1306 A     lsnituatm    0   LIME1ATM 21   2.048M LINE       5      0
ON   3   0
```

```
SLK table is (29 of 1200) 2% full.
```

If no entries are displayed in the `rtrv-slk` output, continue the procedure with Oracle.

If entries are displayed in the `rtrv-slk` output and the `VCI` value of all the signaling links is 16383 of less, continue the procedure with Oracle.

If entries are displayed in the `rtrv-slk` output and the `VCI` value of any of the signaling links is greater than 16383, perform the Removing an SS7 Signaling Link to remove these signaling links. If you wish to add these signaling links back into the database, perform the Adding an ATM High-Speed Signaling Link procedure. The VCI value of these signaling links must ne 16383 or less. After the signaling links have been removed, and added back into the database if desired, continue the procedure with Oracle.

7. Enable a 3 Links per E5-ATM Card quantity with the `enable-ctrl-feat` command specifying the part number for the 3 Links per E5-ATM Card quantity and the feature access key.

   The part numbers and 3 Links per E5-ATM Card quantities are shown in Table C-11.

   For this example, enter this command.

   ```
   enable-ctrl-feat:partnum=893039106:fak=<3 Links per E5-ATM Card
   feature access key for 30 E5-ATMs>
   ```

   > **Note:**
   >
   > A temporary feature access key cannot be specified to enable the 3 Links per E5-ATM Card quantity.

   > **Note:**
   >
   > The values for the feature access key (the `fak` parameter) are provided by Oracle. If you do not have the feature access key for the 3 Links per E5-ATM Card quantity you wish to enable, contact your Oracle Sales Representative or Account Representative.

   When the `enable-ctrl-feat` command has successfully completed, this message should appear.

   ```
   rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

8. Verify the changes by entering the `rtrv-ctrl-feat` command with the 3 Links per E5-ATM Card quantity part number specified in Oracle.

   For this example, enter this command.

   ```
   rtrv-ctrl-feat:partnum=893039106
   ```

The following is an example of the possible output.

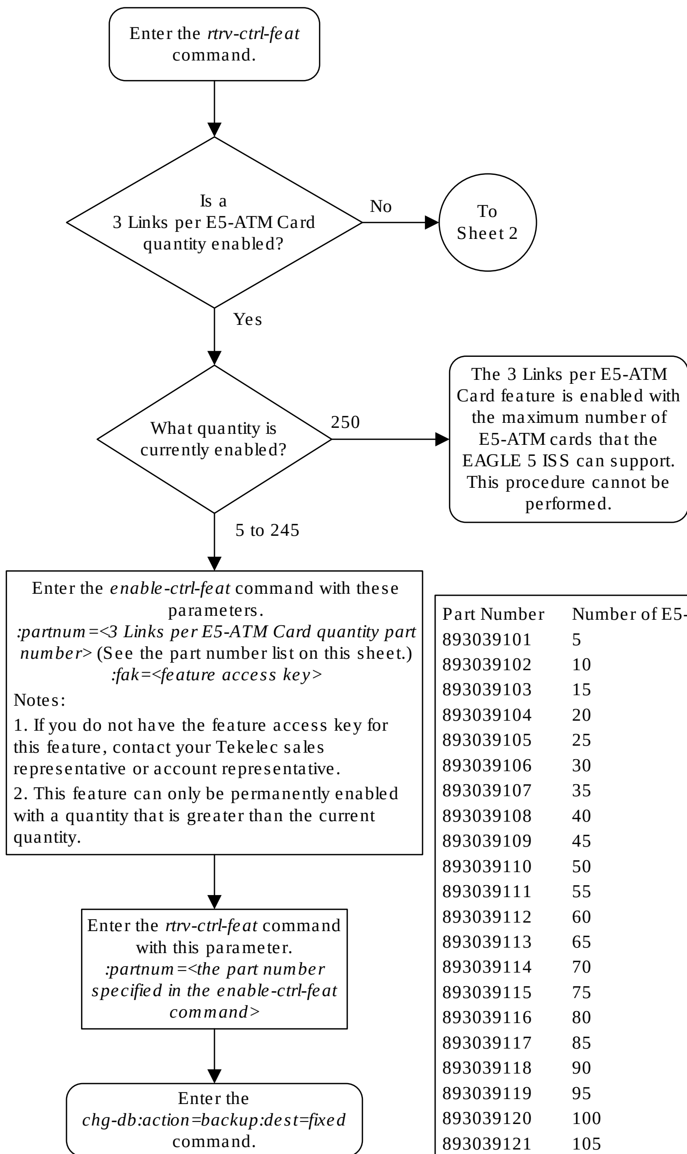
```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
3 Links per E5-ATM Card   893039106  on      30

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

9. Back up the new changes, using the `chg-db:action=backup:dest=fixed` command.

   These messages should appear; the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

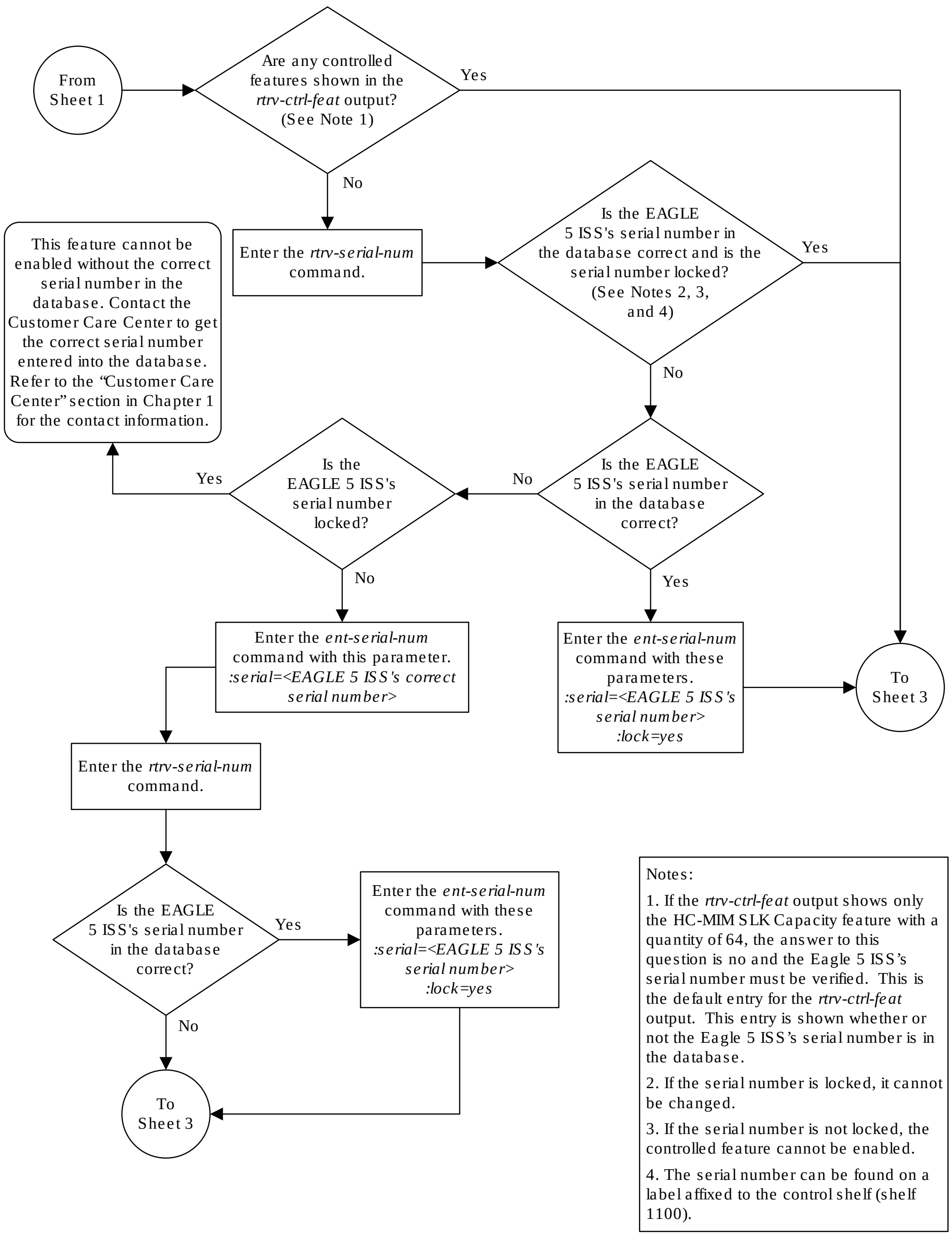
```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure C-12 Changing the Three Links per E5-ATM Card Quantity

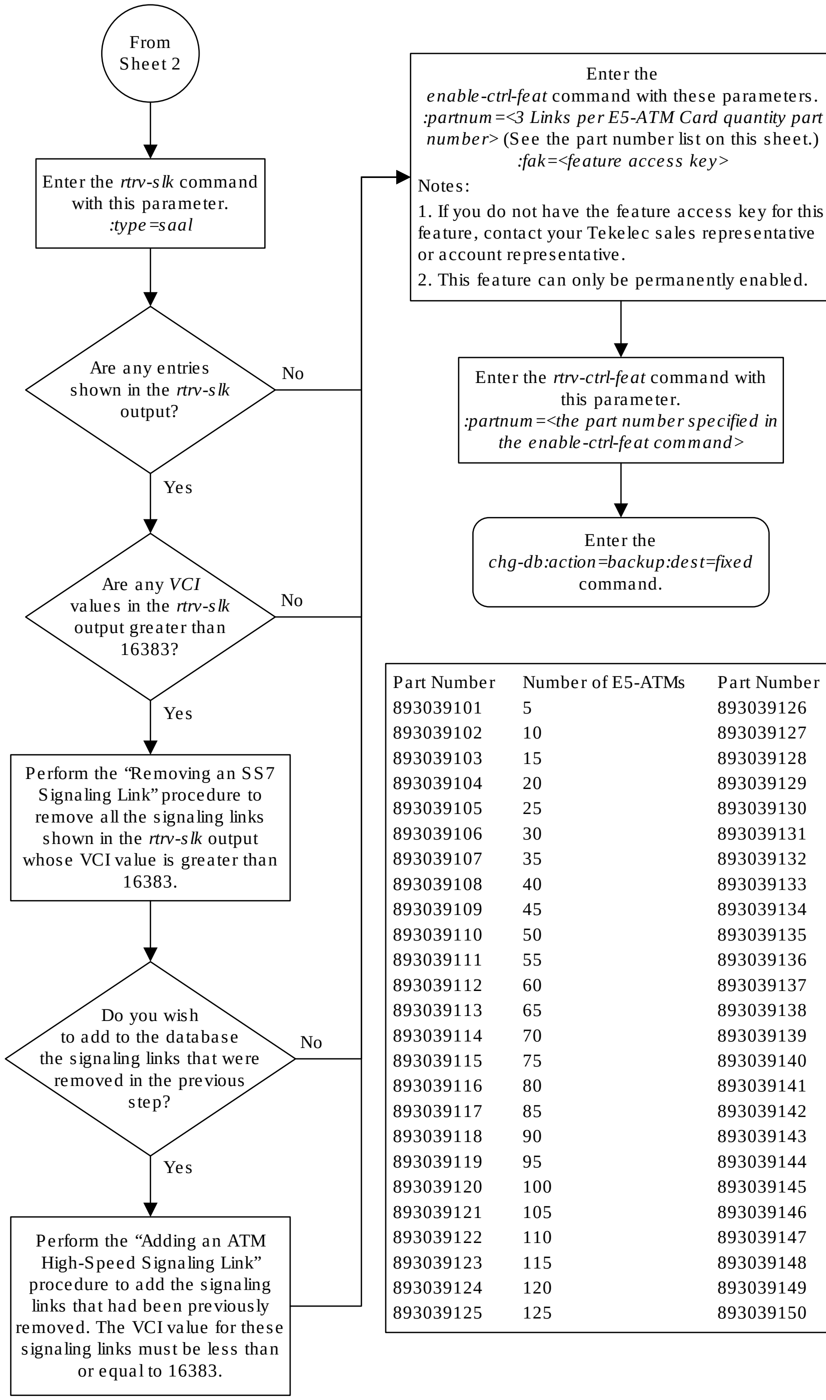


Part Number	Number of E5-ATMs	Part Number	Number of E5-ATMs
893039101	5	893039126	130
893039102	10	893039127	135
893039103	15	893039128	140
893039104	20	893039129	145
893039105	25	893039130	150
893039106	30	893039131	155
893039107	35	893039132	160
893039108	40	893039133	165
893039109	45	893039134	170
893039110	50	893039135	175
893039111	55	893039136	180
893039112	60	893039137	185
893039113	65	893039138	190
893039114	70	893039139	195
893039115	75	893039140	200
893039116	80	893039141	205
893039117	85	893039142	210
893039118	90	893039143	215
893039119	95	893039144	220
893039120	100	893039145	225
893039121	105	893039146	230
893039122	110	893039147	235
893039123	115	893039148	240
893039124	120	893039149	245
893039125	125	893039150	250

Sheet 1 of 3


From Sheet 1
Are any controlled features shown in the rtrv-ctrl-feat output? (See Note 1)
Yes
No
Enter the rtrv-serial-num command.
Is the EAGLE 5 ISS's serial number in the database correct and is the serial number locked? (See Notes 2, 3, and 4)
Yes
No
This feature cannot be enabled without the correct serial number in the database. Contact the Customer Care Center to get the correct serial number entered into the database. Refer to the "Customer Care Center" section in Chapter 1 for the contact information.
Yes
Is the EAGLE 5 ISS's serial number locked?
No
Is the EAGLE 5 ISS's serial number in the database correct?
No
Yes
Enter the ent-serial-num command with this parameter. :serial=<EAGLE 5 ISS's correct serial number>
Enter the ent-serial-num command with these parameters. :serial=<EAGLE 5 ISS's serial number> :lock=yes
To Sheet 3
Enter the rtrv-serial-num command.
Is the EAGLE 5 ISS's serial number in the database correct?
Yes
Enter the ent-serial-num command with these parameters. :serial=<EAGLE 5 ISS's serial number> :lock=yes
No
To Sheet 3
Notes:
1. If the rtrv-ctrl-feat output shows only the HC-MIM SLK Capacity feature with a quantity of 64, the answer to this question is no and the Eagle 5 ISS's serial number must be verified. This is the default entry for the rtrv-ctrl-feat output. This entry is shown whether or not the Eagle 5 ISS's serial number is in the database.
2. If the serial number is locked, it cannot be changed.
3. If the serial number is not locked, the controlled feature cannot be enabled.
4. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Sheet 2 of 3



Part Number	Number of E5-ATMs	Part Number	Number of E5-ATMs
893039101	5	893039126	130
893039102	10	893039127	135
893039103	15	893039128	140
893039104	20	893039129	145
893039105	25	893039130	150
893039106	30	893039131	155
893039107	35	893039132	160
893039108	40	893039133	165
893039109	45	893039134	170
893039110	50	893039135	175
893039111	55	893039136	180
893039112	60	893039137	185
893039113	65	893039138	190
893039114	70	893039139	195
893039115	75	893039140	200
893039116	80	893039141	205
893039117	85	893039142	210
893039118	90	893039143	215
893039119	95	893039144	220
893039120	100	893039145	225
893039121	105	893039146	230
893039122	110	893039147	235
893039123	115	893039148	240
893039124	120	893039149	245
893039125	125	893039150	250

Sheet 3 of 3

C.9 Adding an ATM High-Speed Signaling Link

This procedure is used to add an **ANSI ATM** or **E1** ATM high-speed signaling link to the database using the `ent-slk` command. The `ent-slk` command uses these parameters.

`:loc` – The card location of the **LIM** that the **ATM** high-speed signaling link will be assigned to. The cards specified by this parameter are ATM high-speed LIMs.

`:link` – The signaling link on the card specified in the `loc` parameter.

`:lsn` – The name of the linkset that will contain the signaling link.

`:slc` – The signaling link code. The **SLC** must be unique within the linkset. It must be the same at both the EAGLE location and the distant node.

`:bps` – The transmission rate for the link in bits per second.

`:lpset` – link parameter set identifier – the ATM signaling parameter set. An ATM signaling link can be assigned to any of 30 parameter sets.

`:atmtsel` – ATM timing selector – The source of the timing for the ATM signaling link, internal, line, or external. Internal timing for an ANSI ATM signaling link is derived from an internal clock source operating at 1.544 **MHz** ± 50 ppm. For an E1 ATM signaling link, internal timing is derived from an internal clock source operating at 2.048 MHz ± 50 ppm. Line timing is derived from its received data stream, if present. External timing is derived from a clock source external to the EAGLE. Line timing is the default value for this parameter.

Caution:

The `atmtsel=internal` parameter is only supported for lab use and not for live traffic.

Note:

If the `atmtsel=external` parameter is specified with the `ent-slk` command, make sure that the correct **TDM** (P/N 870-0774-10 or later) is installed in card slots 1114 and 1116. Make sure that the external master clock source is connected to the EAGLE.

Note:

To use an external high-speed master clock source other than RS-422, TDMs 870-0774-15 or later must be installed in card locations 1114 and 1116, and the TDM Global Timing Interface options must be configured. For more information, see the Configuring the Options for the TDM Global Timing Interface procedure.

`:vci` – virtual channel identifier – The identifier of the virtual channel used by the ATM signaling link for virtual channel connections.

`:vpi` – virtual path identifier – The identifier of the virtual path used by the ATM signaling link for virtual path connections.

`:ll` – The length of the cable used for the **ANSI** ATM signaling link. The value of the `ll` parameter is from 0 to 7, with each number representing a range of cable lengths, shown in Table C-12. The default value for this parameter is 0.

Table C-12 ATM Signaling Link Cable Lengths

LL Parameter Value	ATMSignaling Link Cable Length
0	0 to 110 feet
1	110 to 220 feet
2	220 to 330 feet
3	330 to 440 feet
4	440 to 550 feet
5	550 to 660 feet
6	more than 660 feet
7	used for external line buildout networks

`:e1atmcrc4` – Specifies whether or not **CRC4** is enabled on the E1 ATM high-speed signaling link.

`:e1atmsi` – Specifies the value of the two spare international bits of **NFAS** data, from 0 to 3 for the E1 ATM high-speed signaling link.

`:e1atmsn` – Specifies the value of the five spare national bits of NFAS data, from 0 to 31 for the E1 ATM high-speed signaling link.

The `ent-slk` command contains other optional parameters that can be used to configure a signaling link. These parameters are not shown here because they cannot be used to provision an ATM high-speed signaling link. These parameters are explained in more detail in the Adding an SS7 Signaling Link procedure, or in the `ent-slk` command description in the *Commands Manual*.

These items must be configured in the database before an ATM high-speed signaling link can be added:

- Shelf – see Adding a Shelf in the *Database Administration Manual - System Management*
- Card – see Adding an ATM High-Speed LIM
- Destination Point Code – see Adding a Destination Point Code
- Linkset – see Adding an SS7 Linkset.

Adding the ATM high-speed signaling link cannot exceed the total provisioned system TPS shown in the `rtrv-tps` output. The amount of TPS for an ATM high-speed signaling link is shown in this list.

- ANSI ATM high-speed signaling link - 1630 TPS
- ITU ATM high-speed signaling link - 2038 TPS

If adding the ATM high-speed signaling link will exceed the maximum total provisioned system TPS, and the maximum total provisioned system TPS is 500,000, perform the "Activating the HIPR2 High Rate Mode" feature in the *Database Administration Manual - System Management* to enable and turn on the HIPR2 High Rate Mode feature. When the HIPR2 High Rate Mode feature is enabled and turned on, the maximum total provisioned system TPS is increased to 750,000. If the maximum total provisioned system TPS is

750,000, or the maximum total provisioned system TPS is 500,000 and will not be increased, and adding the ATM high-speed signaling link will exceed the maximum total provisioned system TPS, the ATM high-speed signaling link cannot be added unless the amount of available TPS is reduced enough to allow the ATM high-speed signaling link to be added. The available TPS can be reduced by performing one or more of these actions.

- The IP TPS values of some IPGWx linksets have to be changed.
- The MAXSLKTPS values of some IPSG linksets (and the RSVDSLKTPS values if necessary) have to be changed.
- Some ATM high-speed signaling links have to be removed.
- An IPLIMx card that contains signaling links has to be removed.

Verify that the link has been physically installed (all cable connections have been made).

To configure the EAGLE to perform circular routing detection test on the signaling links, Configuring Circular Route Detection procedure.

> **Note:**
>
> Circular route detection is not supported in **ITU** networks.

To provision a EAGLE with more than 1200 signaling links, the EAGLE must have certain levels of hardware installed. See the Requirements for EAGLEs Containing more than 1200 Signaling Links section for more information on these hardware requirements.

The EAGLE can contain a mixture of low-speed, E1, T1, ATM high-speed, and **IP** signaling links. The Determining the Number of High-Speed and Low-Speed Signaling Links section describes how to determine the quantities of the different types of signaling links the EAGLE can have.

ATM High-Speed Signaling Link Parameter Combinations

Table C-13 shows the parameter combinations that can be specified for ATM high-speed signaling links with the `ent-slk` command, and the parameters and values that can be used to provision each type of ATM high-speed signaling link.

Table C-13 ATM High-Speed Signaling Link Parameter Combinations

ATM (ANSI) High-Speed Signaling Link	E1ATM High-Speed Signaling Link
Mandatory Parameters	
:loc = location of the **LIM-ATM**or E5-ATM with the **ATMANSI** application and the **LIMATM** card type.	:loc = location of the E1**HSL** card or E5-ATM with the **ATMITU** application and the **LIME1ATM** card type.
:link = A, B, A1 (See Notes 4 and 5) (See Notes 4, 5, and 6)	:link = A, B, A1 (See Notes 4 and 5) (See Notes 4, 5, and 6)
:lsn = linkset name (See Note 1)	:lsn = linkset name (See Notes 1 and 2)
:slc = 0 - 15	:slc = 0 - 15
Optional Parameters	

Table C-13 (Cont.) ATM High-Speed Signaling Link Parameter Combinations

ATM (ANSI) High-Speed Signaling Link	E1ATM High-Speed Signaling Link
:bps = 1544000 default value = 1544000	:bps = 2048000 default value = 2048000
:lpset = 1 - 30 default value = 1	:lpset = 1 - 30 default value = 1
:atmtsel = line, internal, external default value = line	:atmtsel = line, internal, external default value = line
:vci = 0 - 65535 (See Note 3)(See Notes 3 and 7) default value = 5	:vci = 0 - 65535 (See Note 3)(See Notes 3 and 7) default value = 5
:vpi = 0 - 4095 default value = 0	:vpi = 0 - 4095 default value = 0
:ll = 0 - 7 default value = 0	:e1atmcrc4 = on, off default value = off
	:e1atmsi = 0 - 3 default value = 3
	:e1atmsn = 0 - 31 default value = 0

Notes:

1. The linkset adjacent point code (**APC**) type must match the card's application (ATMANSI - ANSI APC/ATMITU - ITU-I, ITU-N APC). The domain of the linkset adjacent point code must be SS7. A linkset can contain a maximum of 16 signaling links.
2. E1ATM signaling links (signaling links assigned to cards running the ATMITU application) cannot be assigned to linksets containing 24-bit ITU-N APCs (APCN24) or SAPCs (SAPCN24).
3. The values 0 - 4 and 6 - 31 cannot be specified for the `vci` parameter. These values are reserved.
4. The `port` parameter can be used in place of the`link` parameter to specify the signaling link on the card.
5. The `link` parameter value B can be used only if the ATM high-speed LIM is an E5-ATM card.
6. The `link` parameter value A1 can be used only if the ATM high-speed LIM is an E5-ATM card. A 3 Links per E5-ATM Card quantity must be enabled.
7. If a 3 Links per E5-ATM Card quantity is enabled, the `vci` value cannot be greater than 16383.

Canceling the `REPT-STAT-SLK` and `RTRV-SLK` Commands

Because the `rept-stat-slk` and `rtrv-slk` commands used in this procedure can output information for a long period of time, the `rept-stat-slk` and `rtrv-slk` commands can be canceled and the output to the terminal stopped. There are three ways that the `rept-stat-slk` and `rtrv-slk` commands can be canceled.

- Press the F9 function key on the keyboard at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd` without the `trm` parameter at the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered.
- Enter the `canc-cmd:trm=<xx>`, where `<xx>` is the terminal where the `rept-stat-slk` or `rtrv-slk` commands were entered, from another terminal other that the terminal where the `rept-stat-slk` or `rtrv-slk` commands was entered. To enter the `canc-cmd:trm=<xx>` command, the terminal must allow Security Administration commands to be entered from it and the user must be allowed to enter Security Administration commands. The terminal's permissions can be verified with the `rtrv-secu-trm` command. The user's permissions can be verified with the `rtrv-user` or `rtrv-secu-user` commands.

For more information about the `canc-cmd` command, go to the *Commands Manual*.

1. Display the maximum number of signaling links the EAGLE can have and the number of signaling links that are currently provisioned by entering the `rtrv-tbl-capacity` command.

   This is an example of the possible output.

   ```
   rlghncxa03w 09-07-19 21:16:37 GMT EAGLE5 41.1.0

   SLK       table is (         7 of       1200)    1% full
   ```

   > **Note:**
   >
   > The`rtrv-tbl-capacity` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the`rtrv-tbl-capacity` command, refer to the`rtrv-tbl-capacity`command description in the*Commands Manual*.

   If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have (in this example, the maximum number of signaling links is 1200), and the maximum number of signaling links is 2800, this procedure cannot be performed. The EAGLE cannot contain more than 2800 signaling links.

   If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have, and the maximum number of signaling links is less than 2800, perform the Enabling the Large System # Links Controlled Feature procedure to enable the desired quantity of signaling links. After the new quantity of signaling links has been enabled, continue the procedure with 3.

   If the addition of the new signaling link will not exceed the maximum number of signaling links the EAGLE can have, continue the procedure with 3.

2. Display the current signaling link configuration using the `rtrv-slk` command.

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0
                                 L2T               PCR   PCR
LOC   LINK LSN         SLC TYPE      SET   BPS     ECM    N1    N2
1312 A     lsnds0      0    LIMDS0    1     56000  BASIC ---- ------

                                 LP          ATM
LOC   LINK LSN         SLC TYPE      SET BPS     TSEL      VCI    VPI   LL
1305 A     lsnds0      1    LIMATM    1    1.544M LINE      5      0     0

                                 LP          ATM                        E1ATM
LOC   LINK LSN         SLC TYPE      SET BPS     TSEL      VCI    VPI   CRC4  SI
SN
1306 A     lsnituatm   0    LIME1ATM 21   2.048M LINE      5      0     ON    3   0

LOC   LINK LSN         SLC TYPE      ANAME           SLKTPS
1303 A     ipsglsn     0    IPSG      ipsgm2pa1       600
1303 A1    ipsglsn     1    IPSG      ipsgm2pa2       600
1303 B1    ipsglsn     2    IPSG      ipsgm2pa3       600
1303 A2    ipsglsn     3    IPSG      ipsgm2pa4       600
1303 A3    ipsglsn     4    IPSG      ipsgm2pa5       600
1303 B3    ipsglsn2    0    IPSG      ipsgm2pa6       1000
1307 A     ipsglsn     5    IPSG      m2pa2           600

LOC   LINK LSN         SLC TYPE      IPLIML2
1301 A     lsniplim    0    IPLIM     M2PA
1301 A1    lsniplim    1    IPLIM     M2PA
1301 B1    lsniplim    2    IPLIM     M2PA

LOC   LINK LSN         SLC TYPE
1201 A     ipgwx2      2    SS7IPGW
1202 A     ipgwx2      3    SS7IPGW
1203 A     ipgwx2      4    SS7IPGW
1204 A     ipgwx2      5    SS7IPGW
1205 A     ipgwx2      6    SS7IPGW
1206 A     ipgwx2      7    SS7IPGW
1101 A     ipgwx1      0    SS7IPGW
1102 A     ipgwx1      1    SS7IPGW
1103 A     ipgwx1      2    SS7IPGW
1104 A     ipgwx1      3    SS7IPGW
1105 A     ipgwx1      4    SS7IPGW
1106 A     ipgwx1      5    SS7IPGW
1107 A     ipgwx1      6    SS7IPGW
1108 A     ipgwx1      7    SS7IPGW
1111 A     ipgwx2      0    SS7IPGW
1112 A     ipgwx2      1    SS7IPGW

SLK table is (29 of 1200) 2% full.
```

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have (in this example, the maximum number of signaling links is

1200), and the maximum number of signaling links is 2800, this procedure cannot be performed. The EAGLE cannot contain more than 2800 signaling links.

If the addition of the new signaling link will exceed the maximum number of signaling links the EAGLE can have, and the maximum number of signaling links is less than 2800, perform the Enabling the Large System # Links Controlled Feature procedure to enable the desired quantity of signaling links. After the new quantity of signaling links has been enabled, continue the procedure with 3.

If the addition of the new signaling link will not exceed the maximum number of signaling links the EAGLE can have, continue the procedure with 3.

3. Display the total provisioned system TPS by entering the `rtrv-tps` command. This is an example of the possible output.

```
rlghncxa03w 10-07-10 16:20:46 GMT  EAGLE 42.0.0

CARD      NUM    NUM       RSVD        MAX
TYPE    CARDS  LINKS        TPS        TPS
-----   -----  -----   --------   --------
IPGW       17     16      48000      80000
IPSG        3      7       4200       8000
IPLIM       2      4       8000       8000
ATM         2      2       3668       3668

Total provisioned System TPS (99668 of 500000) 20%

Command Completed.
```

An ANSI ATM high-speed signaling link uses 1630 TPS. An ITU ATM high-speed signaling link uses 2038 TPS. If adding the ATM high-speed signaling link will not exceed the maximum total provisioned system TPS, continue the procedure with 98.

If adding the ATM high-speed signaling link will exceed the maximum total provisioned system TPS, and the maximum total provisioned system TPS is 500,000, perform the "Activating the HIPR2 High Rate Mode" feature in the *Database Administration Manual - System Management* to enable and turn on the HIPR2 High Rate Mode feature. When the HIPR2 High Rate Mode feature is enabled and turned on, the maximum total provisioned system TPS is increased to 750,000. After the HIPR2 High Rate Mode feature has been enabled and turned on, continue the procedure with 98.

If the maximum total provisioned system TPS is 750,000, or the maximum total provisioned system TPS is 500,000 and will not be increased, and adding the ATM high-speed signaling link will exceed the maximum total provisioned system TPS, the ATM high-speed signaling link cannot be added unless the amount of available TPS is reduced enough to allow the ATM high-speed signaling link to be added. The available TPS can be increased by performing one or more of these actions.

- The IP TPS values of some IPGWx linksets have to be changed. To perform this action, continue the procedure with 6.
- The MAXSLKTPS values of some IPSG linksets (and the RSVDSLKTPS values if necessary) have to be changed. To perform this action, continue the procedure with 6.

- Some ATM high-speed signaling links have to be removed. To perform this action, continue the procedure with 4.
- An IPLIMx card that contains signaling links has to be removed. To perform this action, continue the procedure with 5.

> **Note:**
>
> If none of these actions are performed, the ATM high-speed signaling link cannot be added and the remainder of this procedure cannot be performed.

4. Display the ATM high-speed signaling links by entering this command.

   `rtrv-slk:type=saal`

   This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                  LP        ATM
LOC   LINK LSN         SLC TYPE      SET BPS    TSEL      VCI    VPI   LL
1303 A     lsnds0      1   LIMATM    1   1.544M LINE      5      0     0

                                  LP        ATM                        E1ATM
LOC   LINK LSN         SLC TYPE      SET BPS    TSEL      VCI    VPI   CRC4  SI
SN
1306 A     lsnituatm   0   LIME1ATM 21   2.048M LINE      5      0     ON    3   0

SLK table is (29 of 1200) 2% full.
```

   If ATM high-speed signaling links are shown in the `rtrv-slk` output, perform the Removing an SS7 Signaling Link procedure to remove some of the ATM high-speed signaling links.

   If ATM high-speed signaling links are not displayed in the `rtrv-slk` output, perform one or more of these actions to increase the available TPS.

> **Note:**
>
> If one or more of these actions are not performed to increase the available TPS and the available TPS will not allow the ATM high-speed signaling link to be added, the ATM high-speed signaling link cannot be added and the remainder of this procedure cannot be performed.

- The IP TPS values of some IPGWx linksets have to be changed. To perform this action, continue the procedure with 6.
- The MAXSLKTPS values of some IPSG linksets (and the RSVDSLKTPS values if necessary) have to be changed. To perform this action, continue the procedure with 6.
- Some ATM high-speed signaling links have to be removed. To perform this action, continue the procedure with 4.

- An IPLIMx card that contains signaling links has to be removed. To perform this action, continue the procedure with 5.

If you do not wish to perform other actions to increase the available TPS and the available TPS will allow the ATM high-speed signaling link to be added, continue the procedure with 98.

5. Display the signaling links that are assigned to IPLIMx cards by entering this command.

`rtrv-slk:type=iplim`

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

LOC   LINK  LSN         SLC  TYPE      ANAME            SLKTPS
1301  A     lsniplim    0    IPLIM     M2PA
1301  A1    lsniplim    1    IPLIM     M2PA
1301  B1    lsniplim    2    IPLIM     M2PA

SLK table is (29 of 1200) 2% full.
```

If IPLIMx cards containing signaling links are shown in the `rtrv-slk` output, perform the " Removing an IPLIMx Card" procedure in the *Database Administration Manual - IP7 Secure Gateway* to remove an IPLIMx card and its associated signaling links.

If IPLIMx cards containing signaling links are not displayed in the `rtrv-slk` output, perform one or more of these actions to increase the available TPS.

> **Note:**
>
> If one or more of these actions are not performed to increase the available TPS and the available TPS will not allow the ATM high-speed signaling link to be added, the ATM high-speed signaling link cannot be added and the remainder of this procedure cannot be performed.

- The IP TPS values of some IPGWx linksets have to be changed. To perform this action, continue the procedure with 6.
- The MAXSLKTPS values of some IPSG linksets (and the RSVDSLKTPS values if necessary) have to be changed. To perform this action, continue the procedure with 6.
- Some ATM high-speed signaling links have to be removed. To perform this action, continue the procedure with 4.

If you do not wish to perform other actions to increase the available TPS and the available TPS will allow the ATM high-speed signaling link to be added, continue the procedure with 98.

6. Display the IPGWx and IPSG linksets by entering this command.

`rept-stat-iptps`

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0
IP TPS USAGE REPORT

           THRESH  CONFIG/  CONFIG/         TPS    PEAK      PEAKTIMESTAMP
                      RSVD      MAX
-------------------------------------------------------------------------
LSN
ipgwx1       100%     ----    32000  TX:    3700   4000   10-07-19 09:49:19
                                     RCV:   3650   4000   10-07-19 09:49:19
ipgwx2       100%     ----    16000  TX:    4800   5000   10-07-19 09:49:09
                                     RCV:   4850   5000   10-07-19 09:49:09
ipgwx3       100%     ----    32000  TX:     427    550   10-07-19 09:49:19
                                     RCV:    312    450   10-07-19 09:49:19
ipsglsn      100%      600    24000  TX:    4800   5000   10-07-19 09:49:19
                                     RCV:   4800   5000   10-07-19
09:49:19
ipsglsn2     100%      600     4000  TX:     427    550   10-07-19 09:49:19
                                     RCV:    312    450   10-07-19
09:49:19
-------------------------------------------------------------------------

Command Completed.
```

If linksets are displayed in the `rept-stat-iptps` output, continue the procedure with 7.

If linksets are not displayed in the `rept-stat-iptps` output, perform one or more of these actions to increase the available TPS.

> **Note:**
>
> If one or more of these actions are not performed to increase the available TPS and the available TPS will not allow the ATM high-speed signaling link to be added, the ATM high-speed signaling link cannot be added and the remainder of this procedure cannot be performed.

- An IPLIMx card that contains signaling links has to be removed. To perform this action, continue the procedure with 5.
- Some ATM high-speed signaling links have to be removed. To perform this action, continue the procedure with 4.

If you do not wish to perform other actions to increase the available TPS and the available TPS will allow the ATM high-speed signaling link to be added, continue the procedure with 98.

7. Display the attributes of the linksets shown in 6 by entering the `rtrv-ls` command with the name of the linkset shown in 6.

   For this example enter these commands.

   `rtrv-ls:lsn=ipgwx1`

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ipgwx1        001-001-002   none 1   1   no  A   8    off off off
no    off

              SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  4          ---    no

           RANDSLS
           off

           IPSG  IPGWAPC  GTTMODE           CGGTMOD
           no    yes      CdPA                no

           MATELSN    IPTPS   LSUSEALM  SLKUSEALM
           ---------- 32000   100%      80%

           LOC  LINK SLC TYPE
           1101 A    0   SS7IPGW
           1102 A    1   SS7IPGW
           1103 A    2   SS7IPGW
           1104 A    3   SS7IPGW
           1105 A    4   SS7IPGW
           1106 A    5   SS7IPGW
           1107 A    6   SS7IPGW
           1108 A    7   SS7IPGW


Link set table is (8 of 1024) 1% full.
```

```
rtrv-ls:lsn=ipgwx2
```

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                 L3T SLT              GWS GWS GWS
LSN           APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ipgwx2        001-001-003   none 1   1   no  A   8    off off off
no    off

              SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
           ---------------- -----------  4          ---    no

           RANDSLS
           off
```

```
                   IPSG  IPGWAPC  GTTMODE          CGGTMOD
                   no    yes      CdPA               no

                   MATELSN    IPTPS   LSUSEALM  SLKUSEALM
                   ---------- 16000   100%      80%

                   LOC  LINK SLC TYPE
                   1111 A    0   SS7IPGW
                   1112 A    1   SS7IPGW
                   1201 A    2   SS7IPGW
                   1202 A    3   SS7IPGW
                   1203 A    4   SS7IPGW
                   1204 A    5   SS7IPGW
                   1205 A    6   SS7IPGW
                   1206 A    7   SS7IPGW


Link set table is (8 of 1024) 1% full.
```

```
rtrv-ls:lsn=ipgwx3
```

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                 L3T SLT              GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ipgwx3         001-001-004   none 1   1   no  A   0    off off off no
off

                  SPCA           CLLI         TFATCABMLQ MTPRSE ASL8
               ---------------- -----------  1          ---    no

               RANDSLS
               off

               IPSG  IPGWAPC  GTTMODE          CGGTMOD
               no    yes      CdPA               no

               MATELSN    IPTPS   LSUSEALM  SLKUSEALM
               ---------- 32000   100%      80%


Link set table is (8 of 1024) 1% full.
```

```
rtrv-ls:lsn=ipsglsn
```

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                 L3T SLT              GWS GWS GWS
```

```
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ipsglsn        003-003-003   none 1   1   no  A   6    off off off
no    off

               SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
            ---------------- -----------  3          ---    no

            RANDSLS
            off

            IPSG  IPGWAPC  GTTMODE          CGGTMOD
            yes   no       CdPA              no

            ADAPTER    RSVDSLKTPS  MAXSLKTPS
            m2pa       600         4000

            TPSALM     LSUSEALM    SLKUSEALM
            rsvdslktps 100%         100%

            LOC  LINK SLC TYPE     ANAME
            1303 A    0   IPSG     ipsgm2pa1
            1303 A1   1   IPSG     ipsgm2pa2
            1303 B1   2   IPSG     ipsgm2pa3
            1303 A2   3   IPSG     ipsgm2pa4
            1303 A3   4   IPSG     ipsgm2pa5
            1307 A    5   IPSG     m2pa2


Link set table is (8 of 1024) 1% full.
```

`rtrv-ls:lsn=ipsglsn2`

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                  L3T SLT              GWS GWS GWS
LSN            APCA   (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
ipsglsn2       005-005-005   none 1   1   no  A   1    off off off
no    off

               SPCA          CLLI         TFATCABMLQ MTPRSE ASL8
            ---------------- -----------  1          ---    no

            RANDSLS
            off

            IPSG  IPGWAPC  GTTMODE          CGGTMOD
            yes   no       CdPA              no

            ADAPTER    RSVDSLKTPS  MAXSLKTPS
            m2pa       600         4000
```

```
            TPSALM      LSUSEALM     SLKUSEALM
            rsvdslktps 100%          100%

            LOC   LINK SLC TYPE      ANAME
            1303 B3    0    IPSG      ipsgm2pa6


Link set table is (8 of 1024) 1% full.
```

Perform one of both of these actions as necessary.

- Perform the "Configuring an IPGWx Linkset" procedure in the *Database Administration Manual - IP7 Secure Gateway* to change the `IPTPS` value for any linksets shown in the `rtrv-ls` output whose `IPGWAPC` value is `yes`.
- Perform the "Changing an IPSG M2PA Linkset" procedure (for linkset whose `IPSG` value is `yes` and `ADAPTER` value is `M2PA`) or the "Changing an IPSG M3UA Linkset" procedure (for linkset whose `IPSG` value is `yes` and `ADAPTER` value is `M3UA`) in the *Database Administration Manual - IP7 Secure Gateway* to change the `MAXSLKTPS` value (and `RSVDSLKTPS` value if necessary) for any linksets shown in the `rtrv-ls` output.

Perform one of both of these actions to increase the available TPS if needed.

- An IPLIMx card that contains signaling links has to be removed. To perform this action, continue the procedure with 5.
- Some ATM high-speed signaling links have to be removed. To perform this action, continue the procedure with 4.

If you do not wish to perform other actions to increase the available TPS and the available TPS will allow the ATM high-speed signaling link to be added, continue the procedure with 98.

8. Display the current signaling link configuration using the `rtrv-slk` command.

   This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0
                                 L2T              PCR   PCR
LOC   LINK LSN         SLC TYPE      SET   BPS     ECM   N1    N2
1312 A     lsnds0      0    LIMDS0    1     56000   BASIC ---- ------


                                 LP          ATM
LOC   LINK LSN         SLC TYPE      SET BPS     TSEL      VCI    VPI   LL
1305 A     lsnds0      1    LIMATM    1    1.544M LINE      5      0     0


                                 LP          ATM                        E1ATM
LOC   LINK LSN         SLC TYPE      SET BPS     TSEL      VCI    VPI   CRC4  SI
SN
1306 A     lsnituatm   0    LIME1ATM 21   2.048M LINE      5      0     ON    3   0

LOC   LINK LSN         SLC TYPE      ANAME            SLKTPS
1303 A     ipsglsn     0    IPSG      ipsgm2pa1        600
1303 A1    ipsglsn     1    IPSG      ipsgm2pa2        600
1303 B1    ipsglsn     2    IPSG      ipsgm2pa3        600
```

```
1303 A2   ipsglsn    3   IPSG     ipsgm2pa4       600
1303 A3   ipsglsn    4   IPSG     ipsgm2pa5       600
1303 B3   ipsglsn2   0   IPSG     ipsgm2pa6       1000
1307 A    ipsglsn    5   IPSG     m2pa2           600

LOC  LINK LSN         SLC TYPE     IPLIML2
1301 A    lsniplim   0   IPLIM    M2PA
1301 A1   lsniplim   1   IPLIM    M2PA
1301 B1   lsniplim   2   IPLIM    M2PA

LOC  LINK LSN         SLC TYPE
1201 A    ipgwx2     2   SS7IPGW
1202 A    ipgwx2     3   SS7IPGW
1203 A    ipgwx2     4   SS7IPGW
1204 A    ipgwx2     5   SS7IPGW
1205 A    ipgwx2     6   SS7IPGW
1206 A    ipgwx2     7   SS7IPGW
1101 A    ipgwx1     0   SS7IPGW
1102 A    ipgwx1     1   SS7IPGW
1103 A    ipgwx1     2   SS7IPGW
1104 A    ipgwx1     3   SS7IPGW
1105 A    ipgwx1     4   SS7IPGW
1106 A    ipgwx1     5   SS7IPGW
1107 A    ipgwx1     6   SS7IPGW
1108 A    ipgwx1     7   SS7IPGW
1111 A    ipgwx2     0   SS7IPGW
1112 A    ipgwx2     1   SS7IPGW

SLK table is (29 of 1200) 2% full.
```

9. Display the cards in the database using the `rtrv-card` command.

   This is an example of the possible output.

```
rlghncxa03w 10-12-28 09:12:36 GMT EAGLE5 43.0.0
CARD   TYPE      APPL     LSET NAME   LINK SLC LSET NAME   LINK SLC
1101   DCM       SS7IPGW  ipgwx1      A    0
1102   DCM       SS7IPGW  ipgwx1      A    1
1103   DCM       SS7IPGW  ipgwx1      A    2
1104   DCM       SS7IPGW  ipgwx1      A    3
1105   DCM       SS7IPGW  ipgwx1      A    4
1106   DCM       SS7IPGW  ipgwx1      A    5
1107   DCM       SS7IPGW  ipgwx1      A    6
1108   DCM       SS7IPGW  ipgwx1      A    7
1111   DCM       SS7IPGW  ipgwx2      A    0
1112   DCM       SS7IPGW  ipgwx2      A    1
1113   GPSM      OAM
1114   TDM-A
1115   GPSM      OAM
1116   TDM-B
1117   MDAL
1201   DCM       SS7IPGW  ipgwx2      A    2
1202   DCM       SS7IPGW  ipgwx2      A    3
```

```
1203    DCM        SS7IPGW  ipgwx2      A    4
1204    DCM        SS7IPGW  ipgwx2      A    5
1205    DCM        SS7IPGW  ipgwx2      A    6
1206    DCM        SS7IPGW  ipgwx2      A    7
1207    DSM        VSCCP
1208    TSM        GLS
1301    DCM        IPLIM    lsniplim    A    0    lsniplim    A1   1
                            lsniplim    B1   2
1302    LIMATM     ATMANSI
1303    ENET       IPSG     ipsglsn     A    0    ipsglsn     A1   1
                            ipsglsn     B1   2    ipsglsn     A2   3
                            ipsglsn     A3   4    ipsglsn2    B3   0
1304    LIMATM     ATMANSI
1305    LIMATM     ATMANSI  lsnds0      A    1
1306    LIME1ATM   ATMITU   lsnituatm   A    0
1307    ENET       IPSG     ipsglsn     A    5
1311    DCM        IPLIM
1312    LIMDS0     SS7ANSI  lsnds0      A    0
1318    LIMATM     ATMANSI
2107    LIMATM     ATMANSI
```

If the ATM high-speed LIM is not shown in the `rtrv-card` output,, perform the Adding an ATM High-Speed LIM procedure to add the ATM high-speed LIM to the database. If the `link` value of the new signaling link will be A1 or B, the card must be an E5-ATM. After the card has been added, perform one of these steps.

- If the `link` value of the new signaling link will be A or B, continue the procedure with 15.
- If the `link` value of the new signaling link will be A1, continue the procedure with 11.

After the Adding an ATM High-Speed LIM procedure has been performed, or if the ATM high-speed LIM is shown in the `rtrv-card` output, continue the procedure with 15.

If the ATM high-speed LIM is shown in the `rtrv-card` output, perform one of these steps.

- If the `link` value of the new signaling link will be A, continue the procedure with 15.
- If the link value of the new signaling link will be A1 or B, continue the procedure with 10.

10. Display the status of the card that the new signaling link will be assigned to by entering the rept-stat-card command with the location of the card from 9. For this example, enter this command.

    `rept-stat-card:loc=2107`

    This is an example of the possible output.

```
rlghncxa03w 10-12-28 09:12:36 GMT EAGLE5 43.0.0
CARD   VERSION      TYPE      GPL        PST            SST       AST
2107   133-045-000  LIMATM    ATMHC      IS-NR          Active    -----
  ALARM STATUS       = No Alarms.
  IMTPCI  GPL version = 133-002-000
```

```
  BLVXW6  GPL version = 133-002-000
  BLDIAG6 GPL version = 133-002-000
  BLBEPM  GPL version = 133-002-000
  BLCPLD  GPL version = 133-002-000
  IMT BUS A           = Conn
  IMT BUS B           = Conn
  CURRENT TEMPERATURE   =  38C (101F)
  PEAK TEMPERATURE:     =  38C (101F)     [07-11-23 06:10]
  SIGNALING LINK STATUS
      SLK    PST                LS            CLLI
      A      IS-NR              lsnatm1       -----------
Command Completed.
```

If the `GPL` value is `ATMHC`, the card is an E5-ATM. Continue the procedure by performing one of these steps.

- If the `link` value of the new signaling link will be B, continue the procedure with 15.
- If the `link` value of the new signaling link will be A1, continue the procedure with 11.

If the `GPL` value is `ATMANSI` or `ATMITU`, the card is not an E5-ATM. Repeat 9 and choose another card.

11. Display the status of the EAGLE features by entering the `rtrv-ctrl-feat` command.

    This is an example of the possible output.

```
rlghncxa03w 10-12-28 21:15:37 GMT EAGLE5 43.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
Command Class Management  893005801  on      ----
LNP Short Message Service 893006601  on      ----
Intermed GTT Load Sharing 893006901  on      ----
XGTT Table Expansion      893006101  on      4000000
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005901  on      1500
Routesets                 893006401  on      6000
HC-MIM SLK Capacity       893012707  on      64
3 Links per E5-ATM Card   893039105  on      25

The following features have been temporarily enabled:

Feature Name              Partnum   Status  Quantity     Trial
Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
```

To specify the `link` value A1 for the new signaling link, a 3 Links per E5-ATM Card quantity must be enabled. A 3 Links per E5-STM Card quantity is shown in the `rtrv-ctrl-feat` output with the entry `3 Links per E5-ATM Card`.

Perform the Changing the Three Links per E5-ATM-B Card Quantity procedure to enable a 3 Links per E5-ATM Card quantity, if a 3 Links per E5-ATM Card quantity is not enabled. After the 3 Links per E5-ATM Card quantity has been enabled, continue the procedure by performing one of these steps.

- If 10 was not performed, continue the procedure with 12.
- If 10 was performed, continue the procedure by performing one of these steps.
  - If the card's state is OOS-MT-DSBLD, continue the procedure with 15.
  - If the card's state is not OOS-MT-DSBLD, continue the procedure with 13. Before the card's state can be OOS-MT-DSBLD, the state of the signaling links that are assigned to the card must be OOS-MT-DSBLD.

If a 3 Links per E5-ATM Card quantity is enabled, continue the procedure by performing one of these steps.

- If adding the new signaling link will not exceed the enabled quantity, continue the procedure with 12.
- If adding the new signaling link will exceed the enabled quantity, continue the procedure by performing one of these steps.
  - If the enabled quantity is 250, the signaling link with the `link` value A1 cannot be added. The EAGLE can contain a maximum of 250 E5-ATMs that have signaling links with the `link` value A1. Continue the procedure by performing one of these steps.
    - If the E5-ATM contains signaling links with the link values A and B, continue the procedure with 9 to choose another card to add the signaling link to.
    - If the E5-ATM does not contain signaling links with the LINK values A and B, continue the procedure with 15 and add the signaling link to the E5-ATM with the link value A or B (the link value on the E5-ATM that is not assigned to a signaling link).
  - If the enabled quantity is less than 250, perform the Changing the Three Links per E5-ATM-B Card Quantity procedure to enable a 3 Links per E5-ATM Card quantity. After the 3 Links per E5-ATM Card quantity has been enabled, continue the procedure by performing one of these steps.
    - If 10 was not performed, continue the procedure with 12.
    - If 10 was performed, continue the procedure by performing one of these steps.
      - If the card's state is OOS-MT-DSBLD, continue the procedure with 15.
      - If the card's state is not OOS-MT-DSBLD, continue the procedure with 13. Before the card's state can be OOS-MT-DSBLD, the state of the signaling links that are assigned to the card must be OOS-MT-DSBLD.

12. Display the status of the card that the new signaling link will be assigned to by entering the rept-stat-card command with the location of the card from 9. For this example, enter this command.

```
rept-stat-card:loc=2107
```

This is an example of the possible output.

```
rlghncxa03w 10-12-28 09:12:36 GMT EAGLE5 43.0.0
CARD   VERSION      TYPE      GPL        PST            SST
AST
2107   133-045-000  LIMATM    ATMHC      IS-NR          Active
-----
  ALARM STATUS       = No Alarms.
  IMTPCI  GPL version = 133-002-000
  BLVXW6  GPL version = 133-002-000
  BLDIAG6 GPL version = 133-002-000
  BLBEPM  GPL version = 133-002-000
  BLCPLD  GPL version = 133-002-000
  IMT BUS A           = Conn
  IMT BUS B           = Conn
  CURRENT TEMPERATURE   =  38C (101F)
  PEAK TEMPERATURE:     =  38C (101F)     [07-11-23 06:10]
  SIGNALING LINK STATUS
      SLK    PST                 LS            CLLI
      A      IS-NR               lsnatm1       -----------
Command Completed.
```

If the card's state is OOS-MT-DSBLD, continue the procedure with 15.

If the card's state is not OOS-MT-DSBLD, continue the procedure with 13. Before the card's state can be OOS-MT-DSBLD, the state of the signaling links that are assigned to the card must be OOS-MT-DSBLD.

13. Deactivate the signaling links that are assigned to the card shown in 10 or 12 by entering the `dact-slk` command. For this example, enter this command.

    `dact-slk:loc=2107:link=a`

    When the command has successfully completed, this message should appear.

    ```
    rlghncxa03w 10-12-07 08:41:12 GMT  EAGLE5 43.0.0
    Deactivate Link message sent to card
    ```

    Repeat this step for each signaling link shown in 10 or 12 whose state is not OOS-MT-DSBLD.

14. Place that card that was specified in 13 out of service by entering the `inh-card` or the `rmv-card` command. The function of the `inh-card` and the `rmv-card` commands are the same. For this example, enter this command.

    `inh-card:loc=2107`

    When this command has successfully completed, this message should appear.

```
rlghncxa03w 10-12-07  11:11:28 GMT  EAGLE5 43.0.0
Card has been inhibited.
```

15. Display the current linkset configuration using the `rtrv-ls` command.

    This is an example of the possible output.

```
rlghncxa03w 10-12-10 11:43:04 GMT EAGLE5 43.0.0

                                 L3T SLT              GWS GWS GWS
LSN            APCA    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
ipgwx1         001-001-002    none 1   1   no  A   8    off off off no
off
ipgwx2         001-001-003    none 1   1   no  A   8    off off off no
off
ipgwx3         001-001-004    none 1   1   no  A   0    off off off no
off
lsniplim       002-002-002    none 1   1   no  A   3    off off off no
off
ipsglsn        003-003-003    none 1   1   no  A   6    off off off no
off
ipsglsn2       005-005-005    none 1   1   no  A   1    off off off no
off
lsnatm1        006-007-008    none 1   1   no  A   1    off off off no
off
lsnds0         009-009-009    none 1   1   no  A   2    off off off no
off

                                 L3T SLT              GWS GWS GWS
LSN            APCI    (SS7)  SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI
NIS
lsnituatm      1-002-3        none 1   2   no  A   1    off off off no
off
atmitu1        3-111-3        none 1   1   no  A   0    off off off ---
off

Link set table is (10 of 1024) 1% full.
```

If the desired linkset is not in the database, perform Adding an SS7 Linkset to add the linkset to the database. After the linkset has been added to the database, continue the procedure by performing one of these steps.

- If the `lpset` parameter will be specified for the signaling link, continue the procedure with 17.
- If the `lpset` parameter will not be specified for the signaling link, continue the procedure with 18.

If the desired linkset is in the database, continue the procedure with 16.

16. Display the linkset that the signaling link is being assigned to using the `rtrv-ls` command, specifying the name of the linkset that the signaling link is being assigned to.

For this example, enter this command.

```
rtrv-ls:lsn=atmitu1
```

This is an example of the possible output.

```
rlghncxa03w 06-10-17 11:43:04 GMT EAGLE5 36.0.0

                                  L3T SLT              GWS GWS GWS
LSN          APCI    (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS
SLSCI NIS
atmitu1      3-111-3        none  1   1   no  A   0    off off off
no    off

             SPCI           CLLI          TFATCABMLQ MTPRSE ASL8
          ---------------- -----------  1          no     ---

          SLSOCBIT  SLSRSB  RANDSLS  MULTGC  ITUTFR
          none      1       off      yes     off

          IPSG  IPGWAPC  GTTMODE          CGGTMOD
          no    no       CdPA               no

          SAPCN
          1234-aa
          1235-bb
          1200-zz

Link set table is (9 of 1024) 1% full.
```

Linksets containing 24-bit ITU-N adjacent point codes (`APCN24`) or secondary adjacent point codes (`SAPCN24`) cannot be assigned to a E1ATM high-speed signaling link. Go back to 15 and choose another linkset, or perform the Adding an SS7 Linkset procedure to add the linkset to the database that does not contain either a 24-bit ITU-N APC or SAPC.

The signaling link cannot be assigned to a linkset whose `IPSG` or `IPGWAPC` values are `yes`. If either the `IPSG` or `IPGWAPC` value for the linkset is `yes`, repeat the procedure from 15 and choose another linkset.

If the `IPSG` and `IPGWAPC` values for the linkset are `no`, continue the procedure by performing one of these steps.

- If the `lpset` parameter will be specified for the signaling link, continue the procedure with 17.
- If the `lpset` parameter will not be specified for the signaling link, continue the procedure with 18.

17. Display the existing values for the **ATM** link parameter set that will be assigned to the signaling link using the `rtrv-atm-lps` command specifying the link parameter set.

    For this example, enter this command.

    ```
    rtrv-atm-lps:lpset=25
    ```

This is an example of the possible output.

```
rlghncxa03w 06-10-28 16:02:05 GMT  EAGLE5 36.0.0
ATM LINK PARAMETER SET TIMERS AND PARAMETERS (TIMERS IN SECONDS)

                              SSCOP PARAMETERS
                              TMR  TMR     TMR    TMR    TMR
LPSET  MAXCC  MAXPD  MAXSTAT  CC   KALIVE  NORSP  POLL   IDLE
25     4      500    67       0.2  0.125   1.5    0.150  0.125

                                SSCF-NNI PARAMETERS
       TMRT1  TMRT2  TMRT3     N1
       05.0   30.0   0.000925  1000

                                SAAL PARAMETERS
       MAX  TMR   TNRNO  TMR    N    TMR
       NRP  SREC  CRED   ERM    BLK  PROV
       0    3600  1.5    0.125  3    0600.0

                          NONCONFIGURABLE PARAMETERS
       SDU   UU       FC  FC
       SIZE  SIZE  N  NR  BC  TSUP  TLOSS  ERMSM  THRES
       272   4     9  --  --  120   1.3    0.1    0.244
```

If you wish to change the values in this ATM parameter set, perform Changing an ATM High-Speed Signaling Link Parameter Set.

> **Caution:**
>
> Changing the values in this ATM link parameter set will impact the performance of all the signaling links using this ATM parameter set.

After the Changing an ATM High-Speed Signaling Link Parameter Set procedure has been performed, or if the values in this **ATM** parameter set were not changed, continue the procedure with 18.

18. Add the signaling link to the database using the `ent-slk` command.

    Use Table C-13 as a guide for the parameters that can be specified with the `ent-slk` command. For this example, enter these commands.

    ```
    ent-slk:loc=1302:link=a:lsn=atmansi0:slc=0:bps=1544000:lpset=3 :atmtsel=external:vci=35:vpi=15:ll=0
    ```

    ```
    ent-slk:loc=1304:link=a:lsn=atmansi1:slc=0:bps=1544000:lpset=4 :atmtsel=internal:vci=100:vpi=20:ll=2
    ```

    ```
    ent-slk:loc=1318:link=a:lsn=atmansi1:slc=1:bps=1544000:lpset=9 :atmtsel=line:vci=150:vpi=25:ll=4
    ```

```
ent-
slk:loc=2101:link=a:lsn=atmitu1:slc=0:bps=2048000:lpset=25 :
atmtsel=line:vci=150:vpi=25:e1atmcrc4=on:e1atmsi=1:e1atmsn=2
0
```

```
ent-
slk:loc=2105:link=a:lsn=atmitu1:slc=1:bps=2048000:lpset=25 :
atmtsel=line:vci=35:vpi=15:e1atmcrc4=on:e1atmsi=2:e1atmsn=15
```

```
ent-
slk:loc=2205:link=a:lsn=atmitu2:slc=0:bps=2048000:lpset=20 :
atmtsel=external:vci=200:vpi=100:e1atmcrc4=on:e1atmsi=3:e1at
msn=10
```

```
ent-
slk:loc=2205:link=b:lsn=atmitu2:slc=1:bps=2048000:lpset=18 :
atmtsel=line:vci=250:vpi=200:e1atmcrc4=on:e1atmsi=1:e1atmsn=
30
```

```
ent-
slk:loc=2207:link=a:lsn=atmansi2:slc=0:bps=1544000:lpset=12
:atmtsel=external:vci=200:vpi=100:ll=4
```

```
ent-
slk:loc=2207:link=b:lsn=atmansi2:slc=1:bps=1544000:lpset=14
:atmtsel=line:vci=300:vpi=150:ll=4
```

```
ent-
slk:loc=2107:link=a1:lsn=atmansi2:slc=2:bps=1544000:lpset=13
:atmtsel=line:vci=300:vpi=150:ll=4
```

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:29:03 GMT  EAGLE5 36.0.0
ENT-SLK: MASP A - COMPLTD
```

> **Note:**
>
> If adding the new signaling link will result in more than 700 signaling links in the database and the OAMHCMEAS value in the`rtrv-measopts` output is`on`, the scheduled UI measurement reports will be disabled.

19. Verify the changes using the `rtrv-slk` command with the `loc` and `link` parameter values specified in 18 .

    For this example, enter these commands.

    `rtrv-slk:loc=1302`

    This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0

                                     LP          ATM
LOC   LINK LSN           SLC TYPE    SET   BPS       TSEL        VCI
```

```
VPI   LL
1302 A    atmansi0      0  LIMATM   3    1.544M   EXTERNAL  35      15     0
```

```
rtrv-slk:loc=1304
```

This is an example of the possible output.

```
rlghncxa03w 10-07-19 21:16:37 GMT EAGLE5 42.0.0

                                   LP           ATM
LOC   LINK LSN          SLC TYPE     SET  BPS      TSEL       VCI     VPI    LL
1304 A    atmansi1      0  LIMATM   4    1.544M   INTERNAL  100     20     2
```

```
rtrv-slk:loc=1318
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
                                   LP           ATM
LOC   LINK LSN          SLC TYPE     SET  BPS      TSEL       VCI     VPI    LL
1318 A    atmansi0      1  LIMATM   9    1.544M   LINE       150     25     4
```

```
rtrv-slk:loc=2101
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
                                   LP          ATM                        E1ATM
LOC   LINK LSN          SLC TYPE     SET BPS     TSEL      VCI    VPI   CRC4 SI
SN
2101 A    atmitu1       0  LIME1ATM 5   2.048M LINE      150    2     ON   1
20
```

```
rtrv-slk:loc=2105
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
                                   LP          ATM                        E1ATM
LOC   LINK LSN          SLC TYPE     SET BPS     TSEL      VCI    VPI   CRC4 SI
SN
2105 A    atmitu1       1  LIME1ATM 5   2.048M LINE      35     15    ON   2
15
```

```
rtrv-slk:loc=2205
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
```

```
                                    LP
ATM                      E1ATM
LOC  LINK LSN           SLC TYPE     SET BPS    TSEL      VCI   VPI
CRC4 SI SN
2205 A    atmitu2        0  LIME1ATM 20  2.048M EXTERNAL 200   100
ON   3  10
2205 B    atmitu2        1  LIME1ATM 18  2.048M LINE      250   200
ON   1  30
```

```
rtrv-slk:loc=2207
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0

                                    LP            ATM
LOC  LINK LSN           SLC TYPE     SET  BPS      TSEL       VCI
VPI   LL
2207 A    atmansi2       0  LIMATM   12   1.544M   EXTERNAL   200
100    4
2207 B    atmansi2       1  LIMATM   14   1.544M   LINE       300
150    4
```

```
rtrv-slk:loc=2107:link=a1
```

This is an example of the possible output.

```
rlghncxa03w 10-12-19 21:16:37 GMT EAGLE5 43.0.0

                                    LP            ATM
LOC  LINK LSN           SLC TYPE     SET  BPS      TSEL       VCI
VPI   LL
2107 A1   atmansi2       2  LIMATM   13   1.544M   LINE       300
150    4
```

If any of the cards shown in this step contain the first signaling link on a card, or if 14 was performed, continue the procedure with 20.

If signaling links were assigned to all the cards shown in this step when 18 was performed, or if 14 was not performed, continue the procedure with 21.

20. Bring into service the cards that contain the first signaling link on that card or that were taken out of service in 14 by entering either the `alw-card` or `rst-card` command with the location of the card specified in 18. The function of the `alw-card` and the `rst-card` commands are the same.If the signaling link added in 18 was the first signaling link assigned to the card, that card must be brought into service with the `rst-card` command, specifying the location of the card specified in 18.

    For this example, enter these commands.

    ```
    rst-card:loc=1302
    ```

rst-card:loc=1304

rst-card:loc=1318

rst-card:loc=2101

rst-card:loc=2105

rst-card:loc=2205

rst-card:loc=2207

When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-23 13:05:05 GMT EAGLE5 36.0.0
Card has been allowed.
```

21. Activate all signaling links on the cards using the `act-slk` command, specifying the card location and signaling link specified in 18.

    For this example, enter these commands.

    act-slk:loc=1302:link=a

    act-slk:loc=1304:link=a

    act-slk:loc=1318:link=a

    act-slk:loc=2101:link=a

    act-slk:loc=2105:link=a

    act-slk:loc=2205:link=a

    act-slk:loc=2205:link=b

    act-slk:loc=2207:link=a

    act-slk:loc=2207:link=b

    act-slk:loc=2107:link=a1

    When each of these commands have successfully completed, this message should appear.

```
rlghncxa03w 06-10-07 08:31:24 GMT  EAGLE5 36.0.0
Activate Link message sent to card
```

22. Check the status of the signaling links added in 18 using the `rept-stat-slk` command with the `loc` and `link` parameter values specified in 18.

    The state of each signaling link should be in service normal (`IS-NR`) after the link has completed alignment (shown in the `PST` field). For this example, enter these commands.

    rept-stat-slk:loc=1302:link=a

    This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK       LSN       CLLI        PST           SST        AST
1302,A    atmansi0  ----------- IS-NR         Avail      ----
```

```
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=1304:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1304,A   atmansi1  ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=1318:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
1318,A   atmansi1  ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2101:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
2101,A   atmitu1   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2105:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK      LSN       CLLI        PST          SST       AST
2105,A   atmitu1   ----------- IS-NR        Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2205:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK       LSN       CLLI        PST           SST       AST
2205,A    atmitu2   ----------- IS-NR         Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2205:link=b
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK       LSN       CLLI        PST           SST       AST
2205,B    atmitu2   ----------- IS-NR         Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2207:link=a
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK       LSN       CLLI        PST           SST       AST
2207,A    atmansi2  ----------- IS-NR         Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2207:link=b
```

This is an example of the possible output.

```
rlghncxa03w 06-10-19 21:16:37 GMT EAGLE5 36.0.0
SLK       LSN       CLLI        PST           SST       AST
2207,B    atmansi2  ----------- IS-NR         Avail     ----
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

```
rept-stat-slk:loc=2107:link=a1
```

This is an example of the possible output.

```
rlghncxa03w 10-12-19 21:16:37 GMT EAGLE5 43.0.0
SLK       LSN       CLLI        PST           SST       AST
2107,A1   atmansi2  ----------- IS-NR         Avail     ----
```

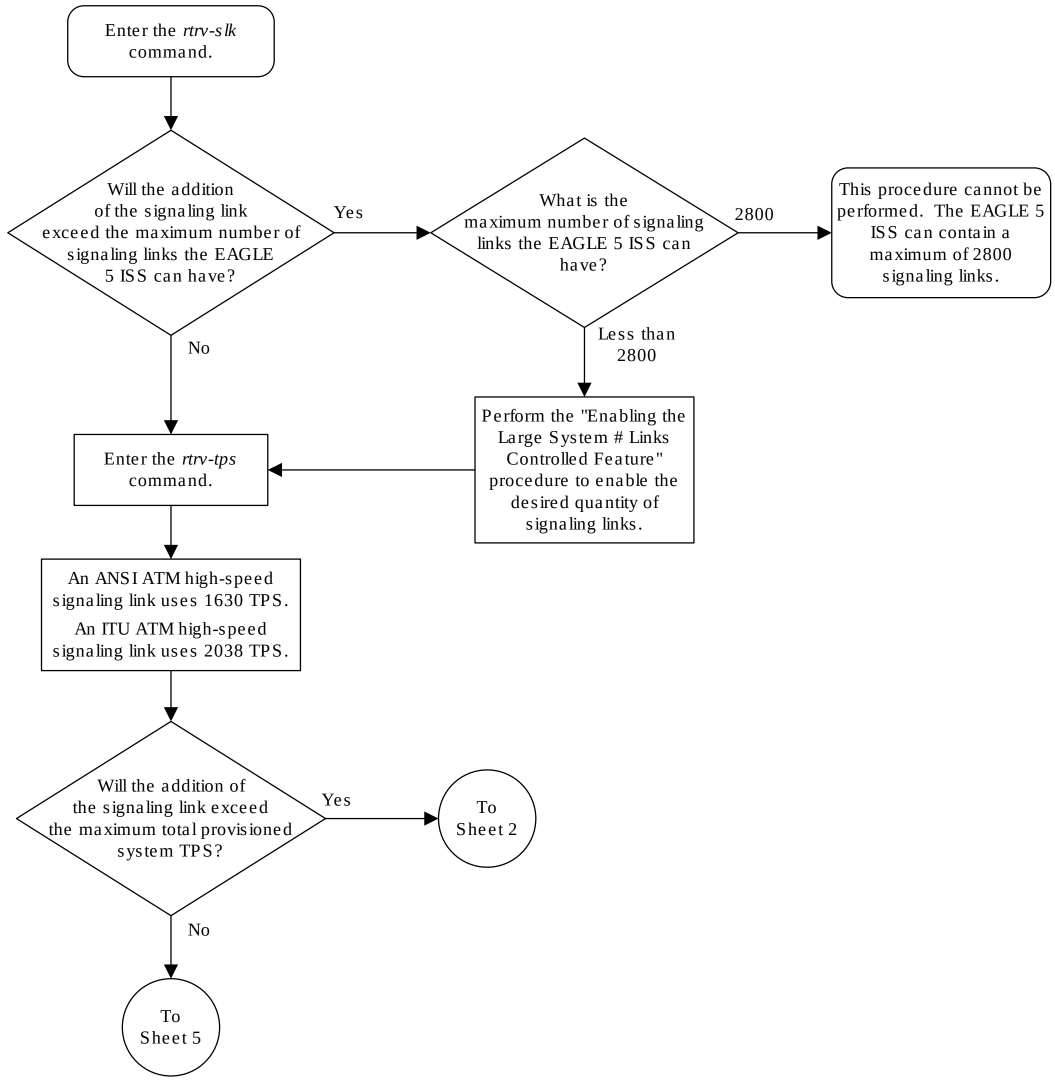
```
  ALARM STATUS       = No Alarms
  UNAVAIL REASON     = --
Command Completed.
```

23. Back up the new changes using the `chg-db:action=backup:dest=fixed` command.

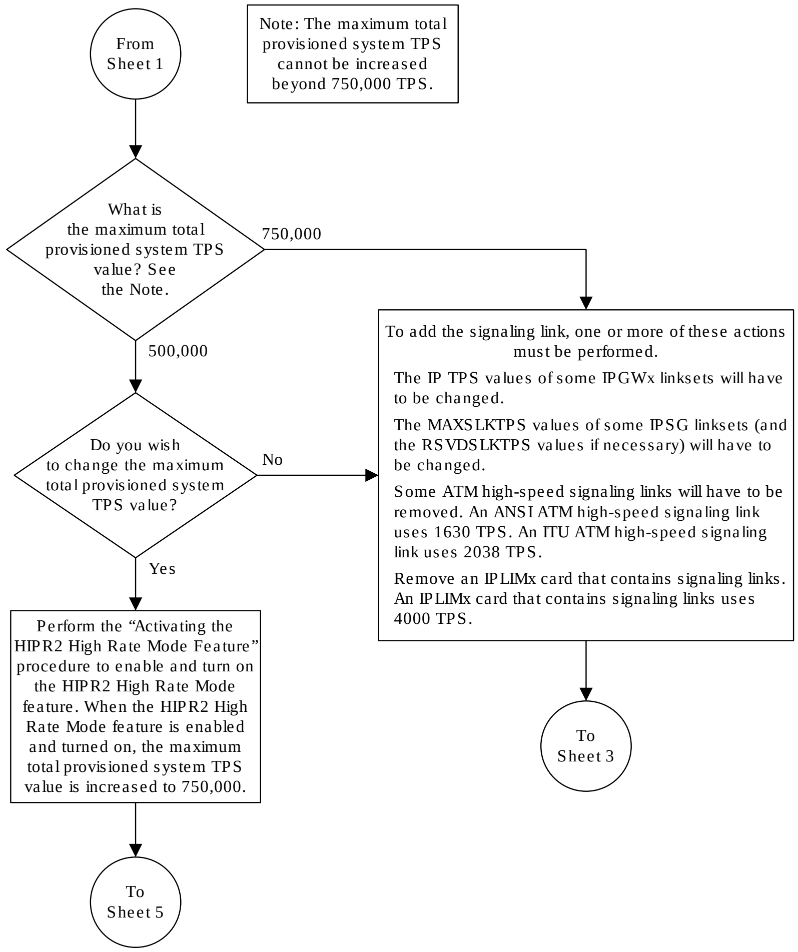
    These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

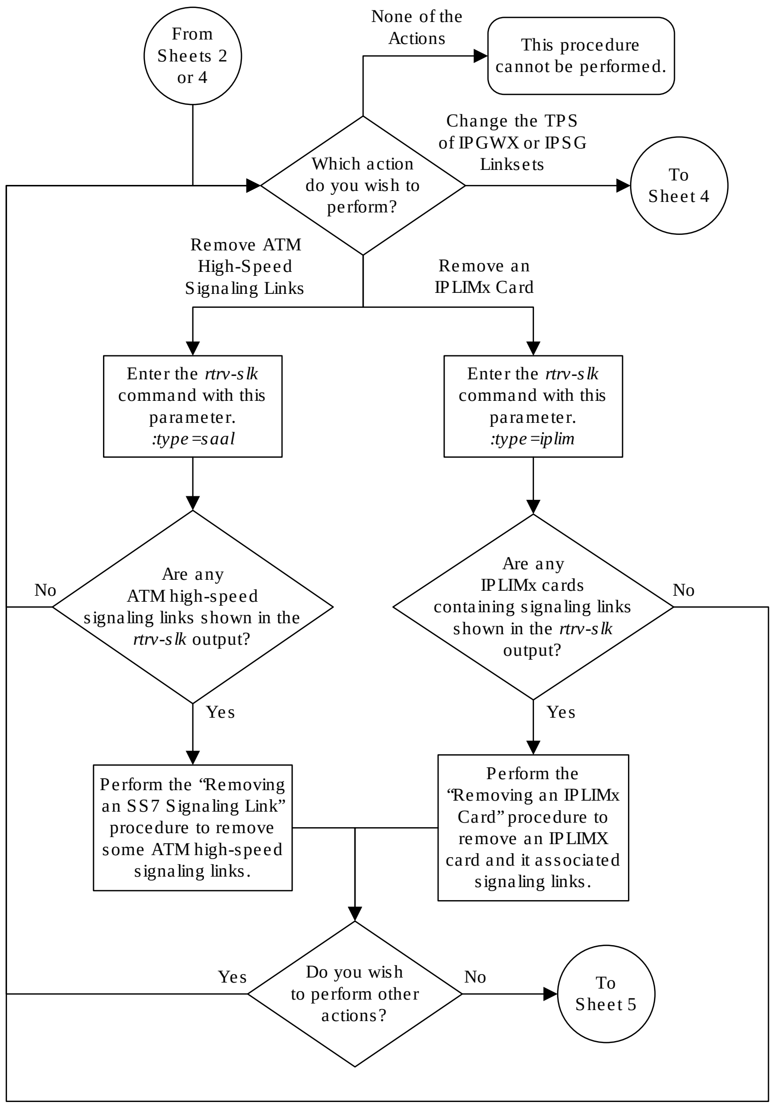
Figure C-13 Adding an ATM High-Speed Signaling Link



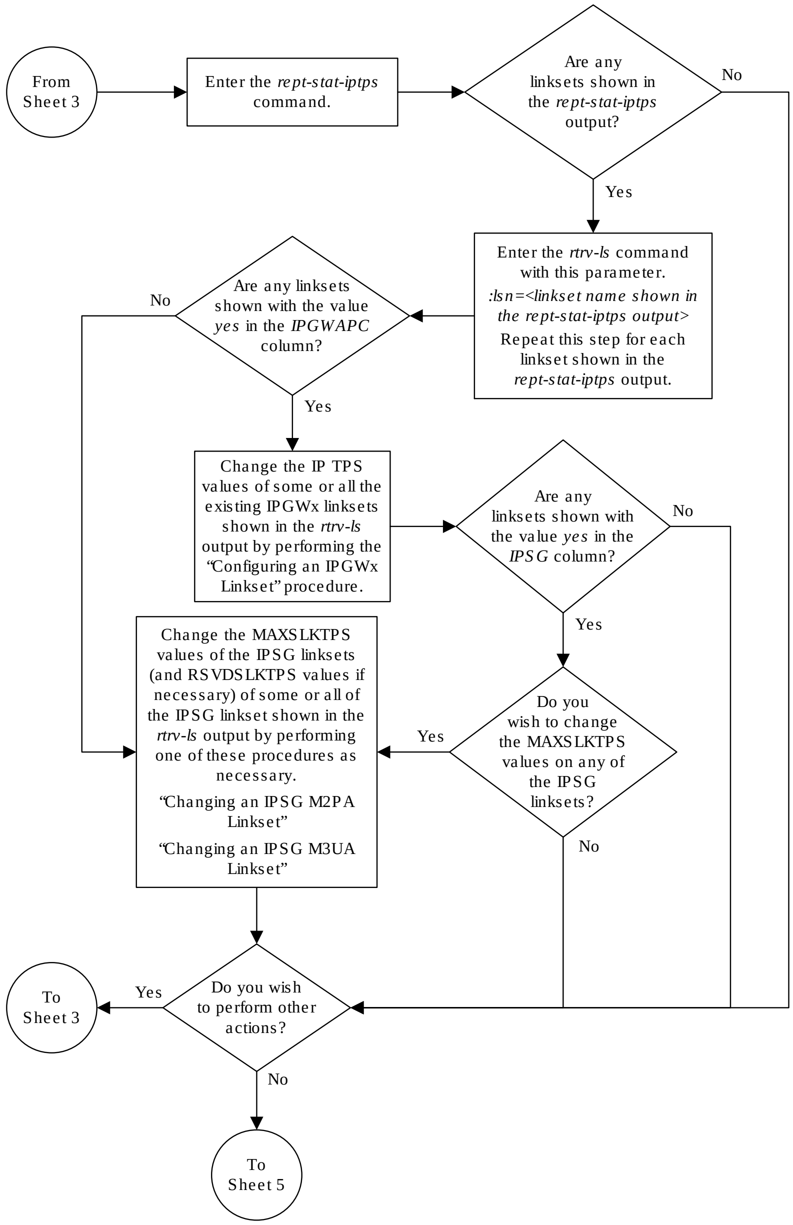
Sheet 1 of 10


From Sheet 1
Note: The maximum total provisioned system TPS cannot be increased beyond 750,000 TPS.
What is the maximum total provisioned system TPS value? See the Note.
750,000
500,000
To add the signaling link, one or more of these actions must be performed.
The IP TPS values of some IPGWx linksets will have to be changed.
The MAXSLKTPS values of some IPSG linksets (and the RSVDSLKTPS values if necessary) will have to be changed.
Some ATM high-speed signaling links will have to be removed. An ANSI ATM high-speed signaling link uses 1630 TPS. An ITU ATM high-speed signaling link uses 2038 TPS.
Remove an IPLIMx card that contains signaling links. An IPLIMx card that contains signaling links uses 4000 TPS.
Do you wish to change the maximum total provisioned system TPS value?
No
Yes
Perform the “Activating the HIPR2 High Rate Mode Feature” procedure to enable and turn on the HIPR2 High Rate Mode feature. When the HIPR2 High Rate Mode feature is enabled and turned on, the maximum total provisioned system TPS value is increased to 750,000.
To Sheet 3
To Sheet 5

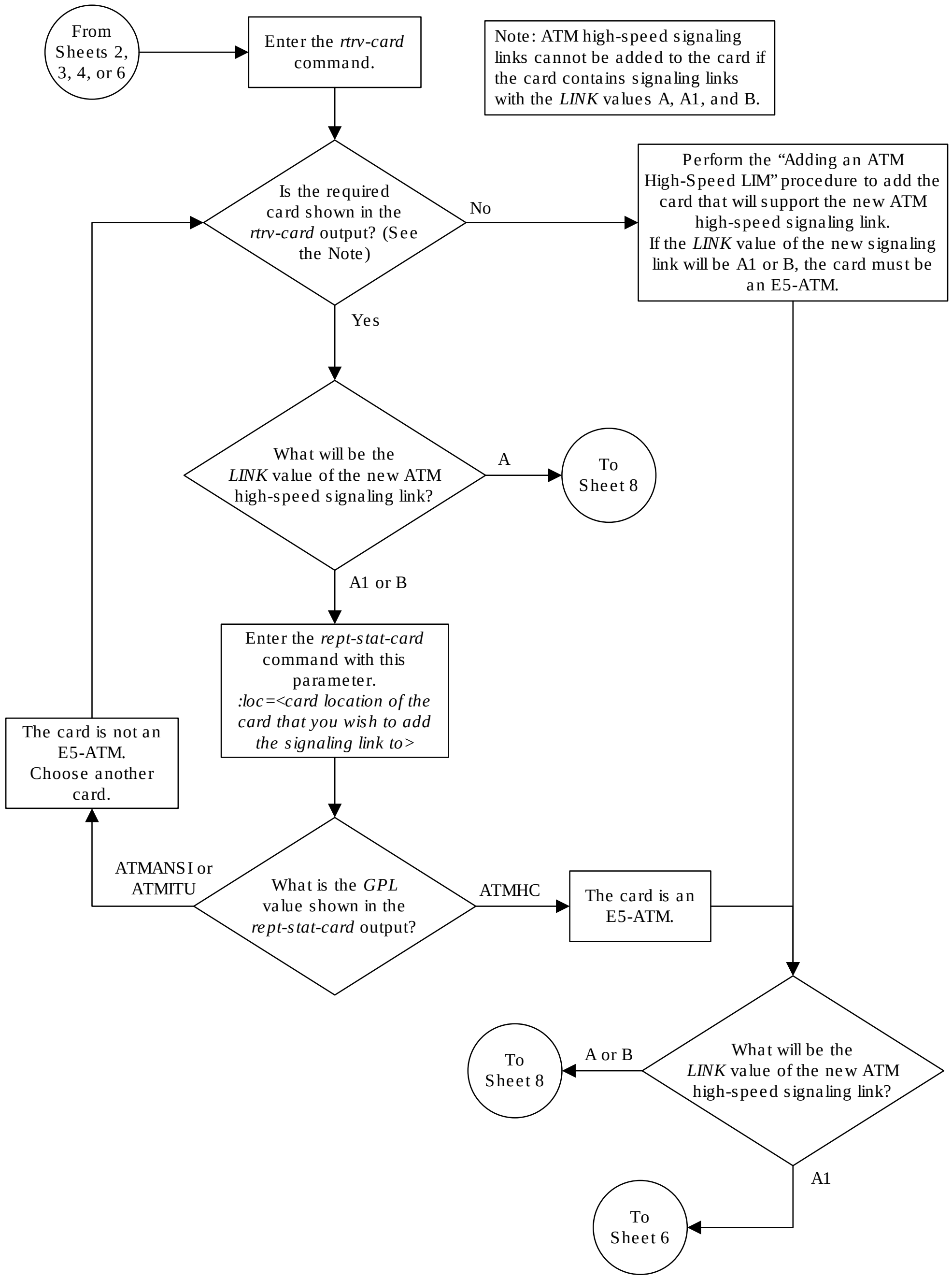
Sheet 2 of 10


From Sheets 2 or 4
None of the Actions
This procedure cannot be performed.
Which action do you wish to perform?
Change the TPS of IPGWX or IPSG Linksets
To Sheet 4
Remove ATM High-Speed Signaling Links
Remove an IPLIMx Card
Enter the rtrv-slk command with this parameter. :type=saal
Enter the rtrv-slk command with this parameter. :type=iplim
No
Are any ATM high-speed signaling links shown in the rtrv-slk output?
Are any IPLIMx cards containing signaling links shown in the rtrv-slk output?
No
Yes
Yes
Perform the "Removing an SS7 Signaling Link" procedure to remove some ATM high-speed signaling links.
Perform the "Removing an IPLIMx Card" procedure to remove an IPLIMX card and it associated signaling links.
Yes
Do you wish to perform other actions?
No
To Sheet 5

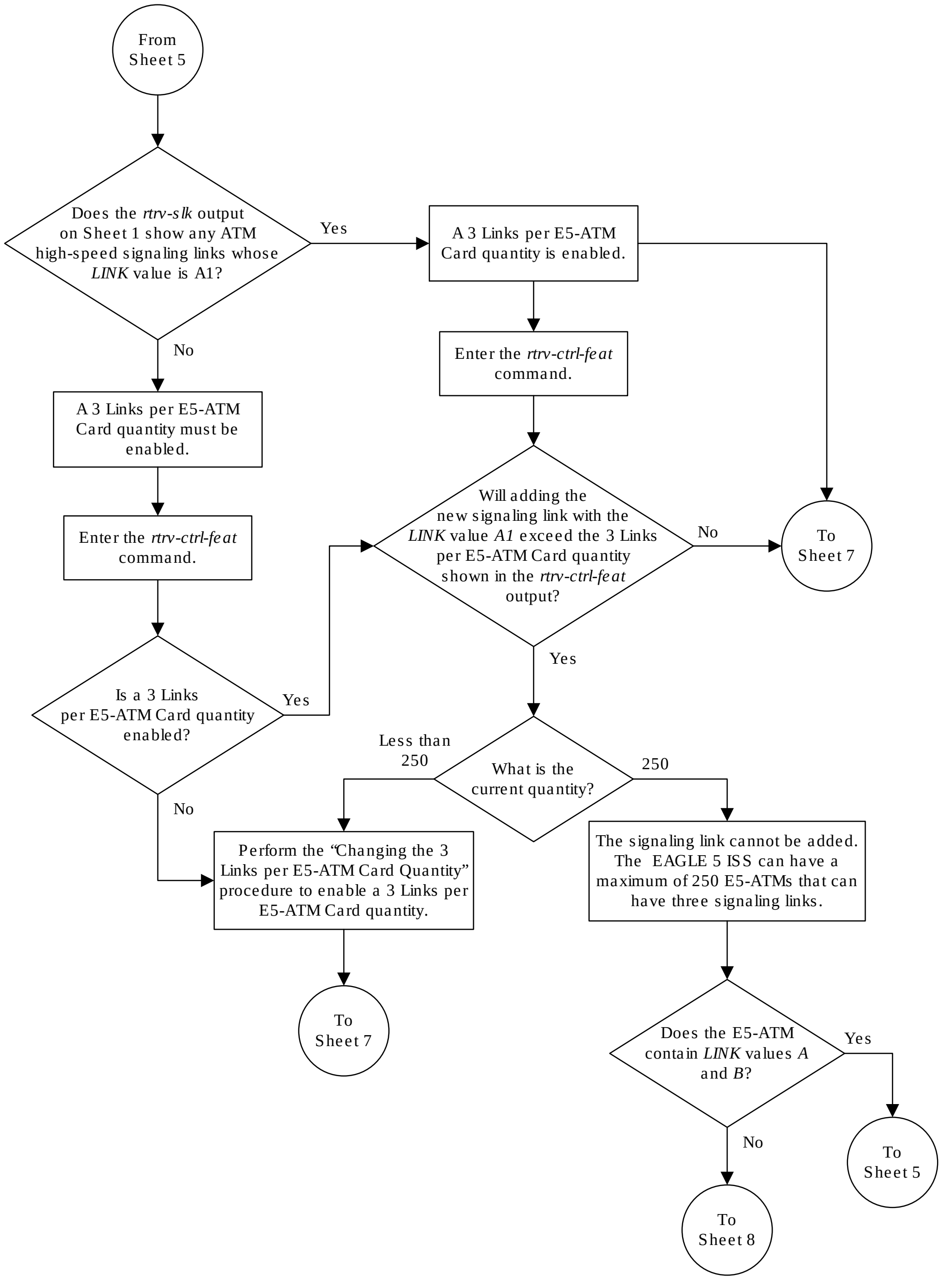
Sheet 3 of 10


From Sheet 3
Enter the rept-stat-iptps command.
Are any linksets shown in the rept-stat-iptps output?
No
Yes
Enter the rtrv-ls command with this parameter.
:lsn=<linkset name shown in the rept-stat-iptps output>
Repeat this step for each linkset shown in the rept-stat-iptps output.
Are any linksets shown with the value yes in the IPGWAPC column?
No
Yes
Change the IP TPS values of some or all the existing IPGWx linksets shown in the rtrv-ls output by performing the "Configuring an IPGWx Linkset" procedure.
Are any linksets shown with the value yes in the IPSG column?
No
Yes
Change the MAXSLKTPS values of the IPSG linksets (and RSVDSLKTPS values if necessary) of some or all of the IPSG linkset shown in the rtrv-ls output by performing one of these procedures as necessary.
"Changing an IPSG M2PA Linkset"
"Changing an IPSG M3UA Linkset"
Yes
Do you wish to change the MAXSLKTPS values on any of the IPSG linksets?
No
To Sheet 3
Yes
Do you wish to perform other actions?
No
To Sheet 5

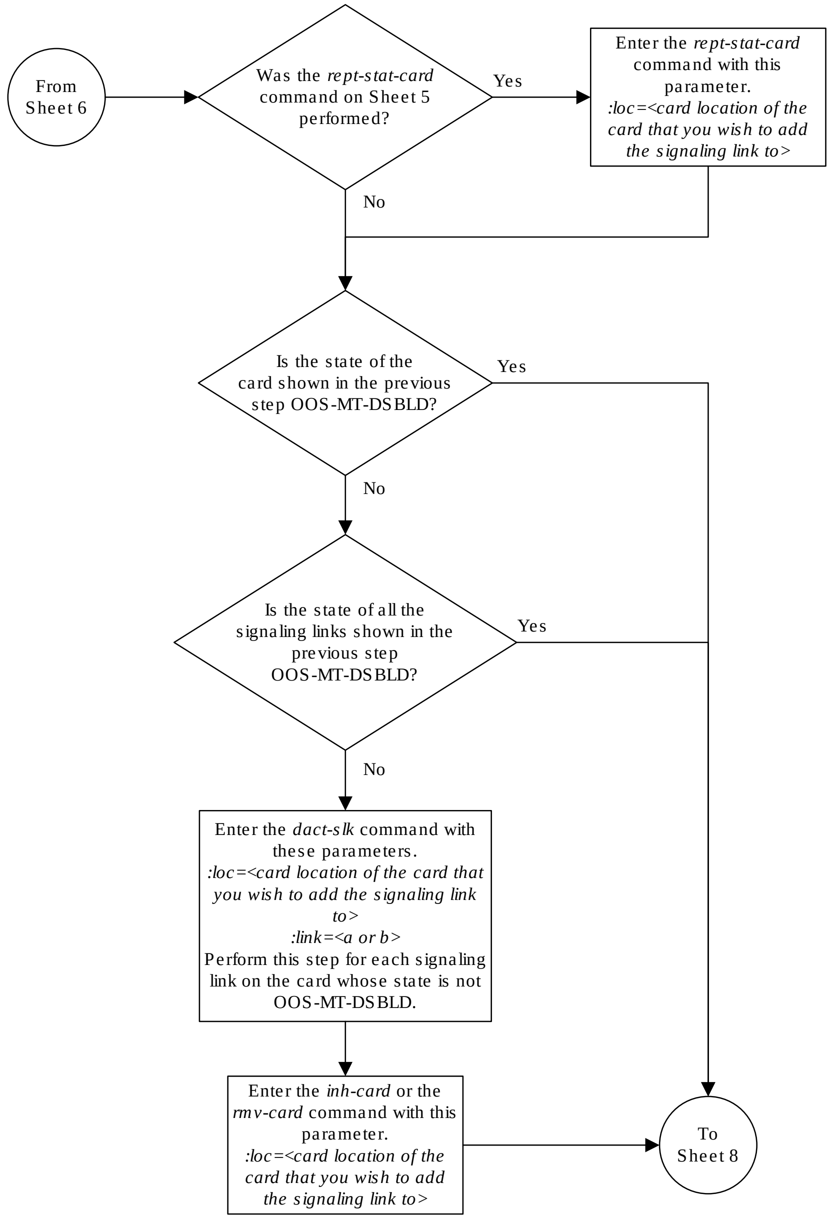
Sheet 4 of 10


From Sheets 2, 3, 4, or 6
Enter the *rtrv-card* command.
Note: ATM high-speed signaling links cannot be added to the card if the card contains signaling links with the *LINK* values A, A1, and B.
Is the required card shown in the *rtrv-card* output? (See the Note)
No
Perform the "Adding an ATM High-Speed LIM" procedure to add the card that will support the new ATM high-speed signaling link.
If the *LINK* value of the new signaling link will be A1 or B, the card must be an E5-ATM.
Yes
What will be the *LINK* value of the new ATM high-speed signaling link?
A
To Sheet 8
A1 or B
Enter the *rept-stat-card* command with this parameter.
:loc=<card location of the card that you wish to add the signaling link to>
The card is not an E5-ATM. Choose another card.
ATMANSI or ATMITU
What is the *GPL* value shown in the *rept-stat-card* output?
ATMHC
The card is an E5-ATM.
What will be the *LINK* value of the new ATM high-speed signaling link?
A or B
To Sheet 8
A1
To Sheet 6

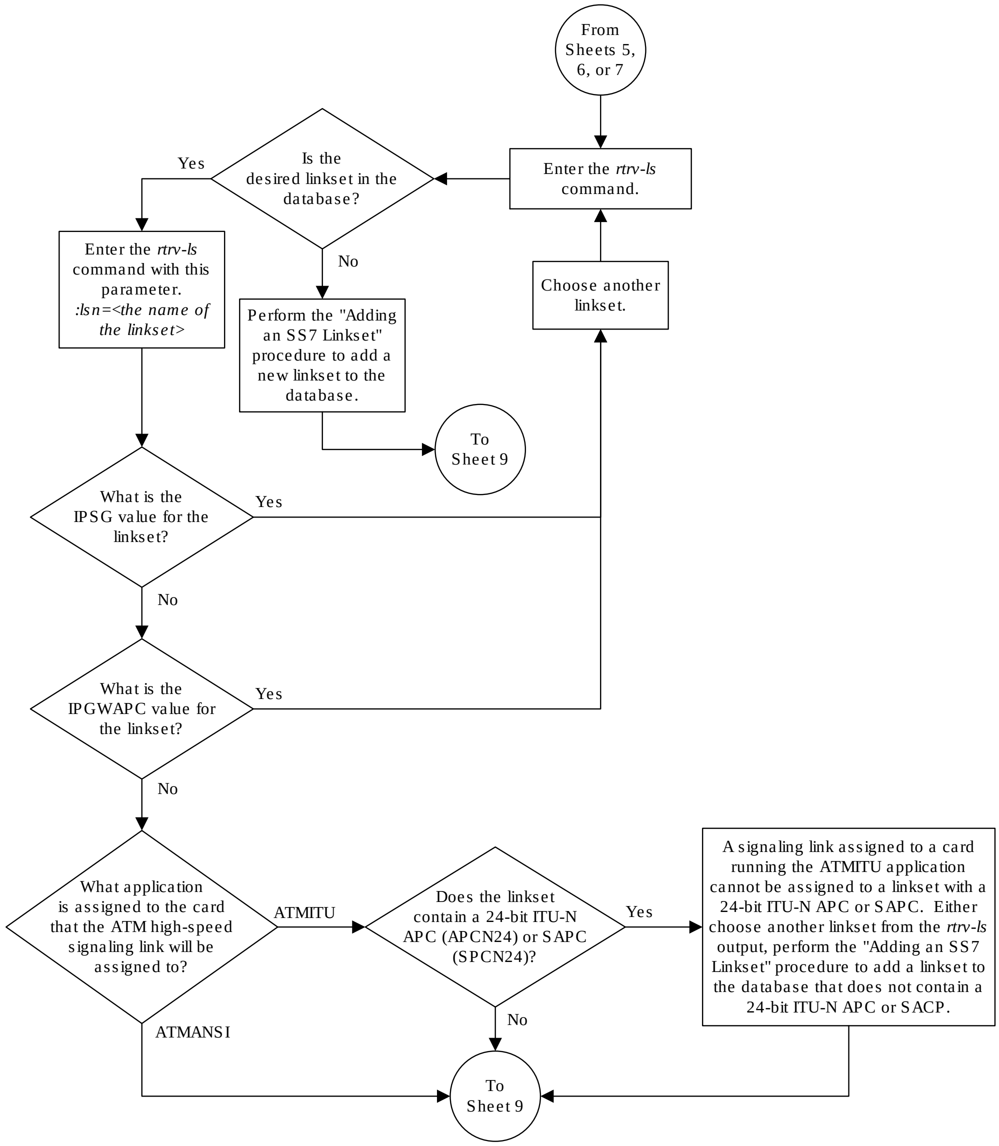
Sheet 5 of 10


From Sheet 5
Does the rtrv-slk output on Sheet 1 show any ATM high-speed signaling links whose LINK value is A1?
Yes
No
A 3 Links per E5-ATM Card quantity is enabled.
Enter the rtrv-ctrl-feat command.
A 3 Links per E5-ATM Card quantity must be enabled.
Enter the rtrv-ctrl-feat command.
Will adding the new signaling link with the LINK value A1 exceed the 3 Links per E5-ATM Card quantity shown in the rtrv-ctrl-feat output?
No
To Sheet 7
Yes
Is a 3 Links per E5-ATM Card quantity enabled?
Yes
No
What is the current quantity?
Less than 250
250
Perform the "Changing the 3 Links per E5-ATM Card Quantity" procedure to enable a 3 Links per E5-ATM Card quantity.
The signaling link cannot be added. The EAGLE 5 ISS can have a maximum of 250 E5-ATMs that can have three signaling links.
To Sheet 7
Does the E5-ATM contain LINK values A and B?
Yes
No
To Sheet 5
To Sheet 8

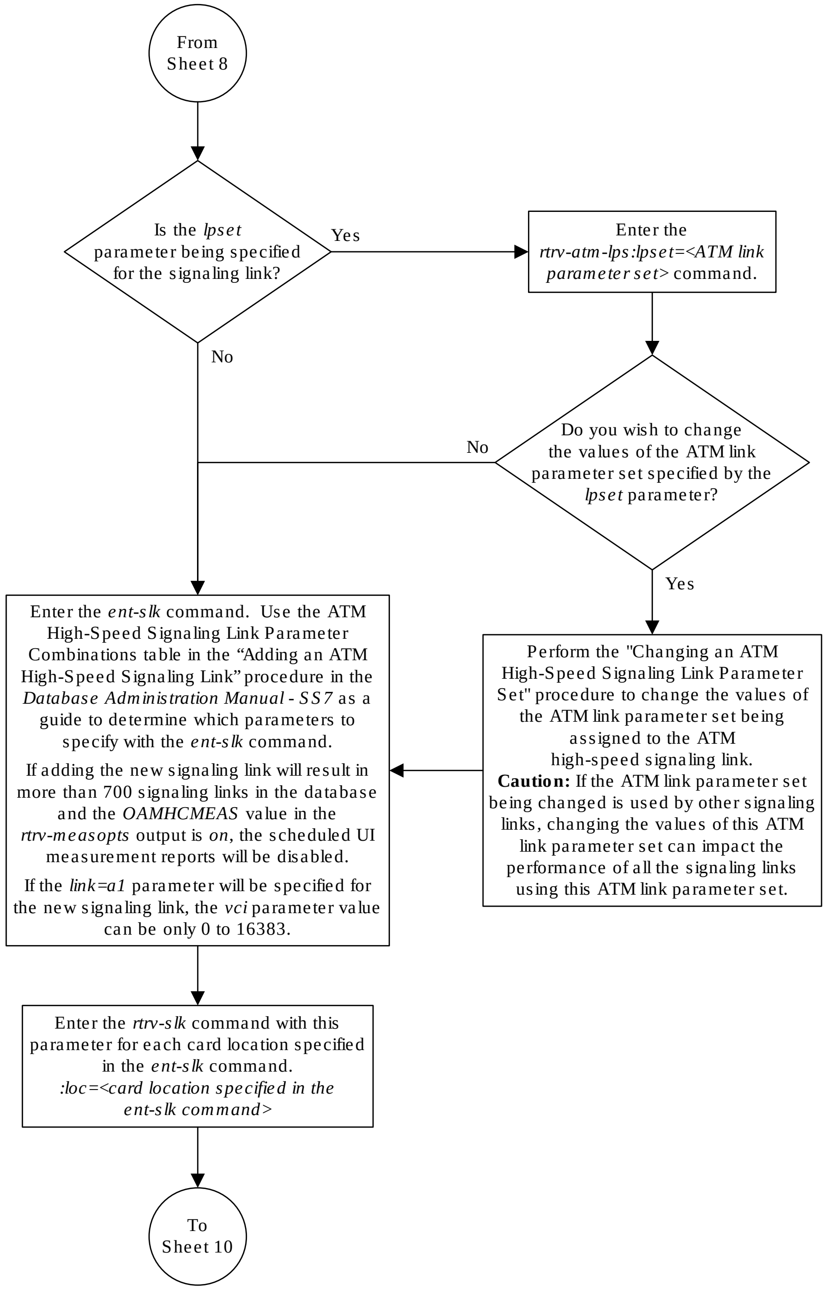
Sheet 6 of 10


From Sheet 6
Was the *rept-stat-card* command on Sheet 5 performed?
Yes
Enter the *rept-stat-card* command with this parameter.
:loc=<card location of the card that you wish to add the signaling link to>
No
Is the state of the card shown in the previous step OOS-MT-DSBLD?
Yes
No
Is the state of all the signaling links shown in the previous step OOS-MT-DSBLD?
Yes
No
Enter the *dact-slk* command with these parameters.
:loc=<card location of the card that you wish to add the signaling link to>
:link=<a or b>
Perform this step for each signaling link on the card whose state is not OOS-MT-DSBLD.
Enter the *inh-card* or the *rmv-card* command with this parameter.
:loc=<card location of the card that you wish to add the signaling link to>
To Sheet 8

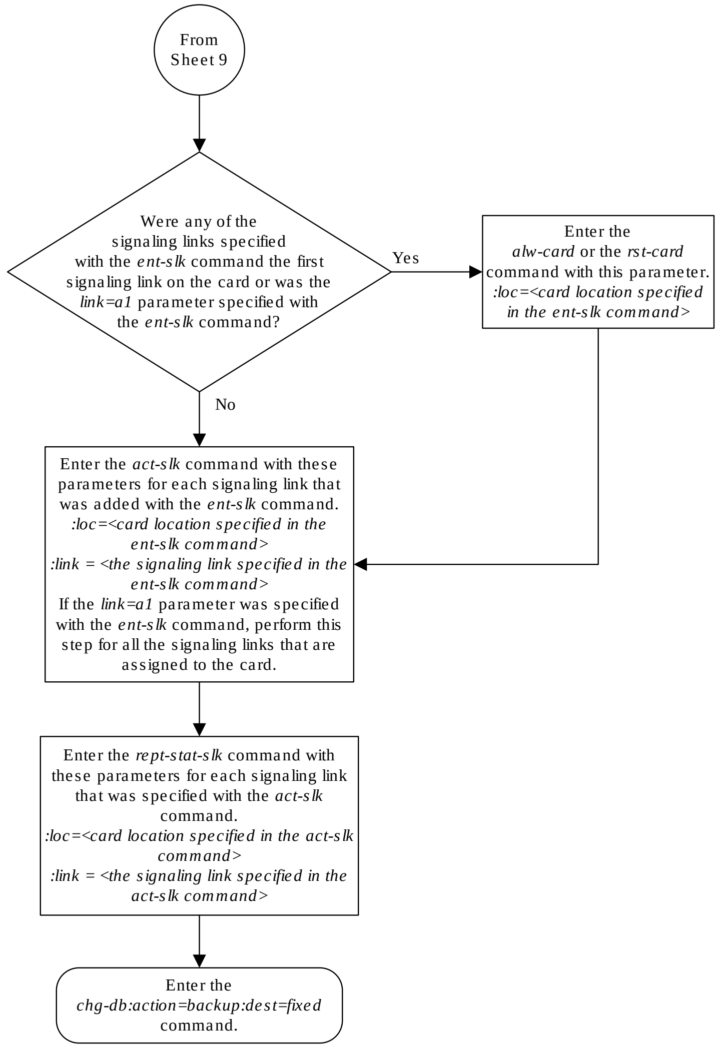
Sheet 7 of 10


From Sheets 5, 6, or 7
Enter the rtrv-ls command.
Is the desired linkset in the database?
Yes
No
Enter the rtrv-ls command with this parameter. :lsn=<the name of the linkset>
Perform the "Adding an SS7 Linkset" procedure to add a new linkset to the database.
To Sheet 9
Choose another linkset.
What is the IPSG value for the linkset?
Yes
No
What is the IPGWAPC value for the linkset?
Yes
No
What application is assigned to the card that the ATM high-speed signaling link will be assigned to?
ATMITU
ATMANSI
Does the linkset contain a 24-bit ITU-N APC (APCN24) or SAPC (SPCN24)?
Yes
No
A signaling link assigned to a card running the ATMITU application cannot be assigned to a linkset with a 24-bit ITU-N APC or SAPC. Either choose another linkset from the rtrv-ls output, perform the "Adding an SS7 Linkset" procedure to add a linkset to the database that does not contain a 24-bit ITU-N APC or SACP.
To Sheet 9

Sheet 8 of 10


From Sheet 8
Is the *lpset* parameter being specified for the signaling link?
Yes
Enter the *rtrv-atm-lps:lpset=<ATM link parameter set>* command.
No
Do you wish to change the values of the ATM link parameter set specified by the *lpset* parameter?
No
Yes
Enter the *ent-slk* command. Use the ATM High-Speed Signaling Link Parameter Combinations table in the "Adding an ATM High-Speed Signaling Link" procedure in the *Database Administration Manual - SS7* as a guide to determine which parameters to specify with the *ent-slk* command.
If adding the new signaling link will result in more than 700 signaling links in the database and the *OAMHCMEAS* value in the *rtrv-measopts* output is *on*, the scheduled UI measurement reports will be disabled.
If the *link=a1* parameter will be specified for the new signaling link, the *vci* parameter value can be only 0 to 16383.
Perform the "Changing an ATM High-Speed Signaling Link Parameter Set" procedure to change the values of the ATM link parameter set being assigned to the ATM high-speed signaling link.
Caution: If the ATM link parameter set being changed is used by other signaling links, changing the values of this ATM link parameter set can impact the performance of all the signaling links using this ATM link parameter set.
Enter the *rtrv-slk* command with this parameter for each card location specified in the *ent-slk* command.
:loc=<card location specified in the ent-slk command>
To Sheet 10

Sheet 9 of 10



Sheet 10 of 10

C.10 Changing an ATM High-Speed Signaling Link Parameter Set

This procedure is used to change any of the **ATM** signaling link parameters using the `chg-atm-lps` command or to copy the values from one link parameter set to another.

> **Caution:**
>
> Changing the values in an ATM link parameter set will impact the performance of all the signaling links using the ATM parameter set being changed.

The `chg-atm-lps` command uses these parameters.

`:lpset` – the link parameter set being changed.

Range of values – 1 - 30

`:action` – copy a set of ATM signaling link parameters from one parameter set to another.

Value – copy

`:srclpset` – the ATM signaling link parameter set used as a source for the `action=copy` parameter.

Range of values – 1 - 30

`:maxcc` – the maximum number of transmissions of a **BGN**, **END**, **ER**, or **RS PDU**

Range of values – 1 - 10

System default – 4

`:maxpd` – the maximum number of **SD PDUs** that can be sent before a **POLL** is sent

Range of values – 5 - 2120

System default – 500

`:maxstat` – the maximum number of list elements in a **STAT PDU**

Range of values – 3 - 67

System default – 67

`:tmrcc` – the timer, in milliseconds, used during the connection phase to guard against unacknowledged **BGN**, **END**, **ER** or **RS PDUs**

Range of values – 100 - 2000

System default – 200

`:tmrkalive` – the timer, in milliseconds, used during the transient phase when no **SD PDUs** are being sent to keep connection up

Range of values – 25 - 500

System default – 100

`:tmrnorsp` – the timer, in milliseconds, used to check that **STAT PDUs** are arriving often enough

Range of values – 500 - 2000

System default – 1500

`:tmrpoll` – the timer, in milliseconds, used to guarantee that **POLL PDUs** are sent often enough

Range of values – 25 - 500

System default – 100

`:tmridle` – the timer, in milliseconds, used during the idle phase when no **SD PDUs** are being sent to limit time in the idle phase

Range of values – 25 - 1000

System default – 100

`:tmrt1` – the time, in milliseconds, between link release action and the next link reestablish action during alignment

Range of values – 1000 - 15000

System default – 5000

`:tmrt2` – the total time, in milliseconds, that **SSCF** will attempt alignment

Range of values – 15000 - 180000

System default (**ANSI ATM**) – 120000

System default (**E1 ATM**) – 30000

`:tmrt3` – the time, in microseconds, between proving **PDUs**

Range of values – 450 - 23000

System default – 925

`:n1` – the number of **PDUs** sent during proving

Range of values – 500 - 64552

System default (**ANSI ATM**) – 64552

System default (**E1 ATM**) – 1000

`:maxnrp` – the maximum number of retransmitted **PDUs** during proving

Range of values (**ANSI ATM**) – 1 - 10

Range of values (**E1 ATM**) – 0 - 10

System default (**ANSI ATM**) – 1

System default (**E1 ATM**) – 0

`:tmrsrec` – the timer, in milliseconds, used to prohibit closely spaced **SSCOP** recoveries from occurring

Range of values – 60000 - 10800000

System default – 3600000

`:tmrnocred` – the timer, in milliseconds, used when no credit exists and **PDUs** are available to be sent

Range of values – 1000 - 6000

System default – 1500

`:tmrerm` – the error rate monitor interval, in milliseconds

Range of values – 25 - 500

System default – 100

`:nblk` – the number of monitoring intervals per block

Range of values – 1 - 10

System default – 3

`:tmrprov` – the timer, in milliseconds, used to monitor the status of a link after it is placed into service

Range of values – 60000 - 1200000

System default – 600000

Link parameter sets 20 and 30 cannot be changed. The values in link parameter set 20 are set to the **ANSI** default values. The values in link parameter set 30 are set to the **ITU** default values. The values in link parameter set 20 and 30 can be copied to another link parameter set.

The values of the `lpset` and `srclpset` parameters cannot be the same.

The `action` and the `srclpset` parameters must be specified together.

If the `action` parameter is specified, only the `lpset` and `srclpset` parameters can be specified.

For any parameters not specified with the `chg-atm-lps` command, the values for those parameters are not changed.

The ATM parameter set values applied to ATM high-speed signaling links are displayed with the `rtrv-atm-lps` and `rtrv-atm-prm` commands. The values displayed with the `rtrv-atm-prm` command are not configurable. These values are:

`PCR` – The maximum or peak cell rate for the **VCL** (virtual channel link).

`DS1 PCR` value – 3622

`E1 PCR` value – 4528

`SCR` – The average or sustainable cell rate supported on the **VCL**.

`DS1 SCR` value – 3622

`E1 PCR` value – 4528

`BT` – Burst tolerance. The number of consecutive cells on the **VCL** permitted on the **ATM** interface by the enforcement process, given the **PCR** and the line speed.

Value – 210

`CDVT` – The amount of cell delay variation, in microseconds, for the **VCL** in the network ingress direction.

Value – 100

`QoS` – Quality of service. The performance objectives that must be met by the **ATM VCL** when it must discard cells during enforcement of the traffic parameters.

Value – 3

`MaxVPC` – The maximum number of simultaneously active Virtual Path Connections (**VPCs**) supported (by the **ATM** interface).

Value – 0

`MAXVCC` – The maximum number of simultaneously active Virtual Circuit Connections (**VCCs**) supported.

Value – 1

`AllocVPI BITS` – The number of bits to be used in the **VPIs** in the **ATM** cells for the **VPLs** terminated on the **ATM** interface.

Value – 12

`AllocVCI BITS` – The number of allocated **VCI** bits to be used in the **VPIs** in the **ATM** cells for the **VCLs** supported on the **ATM** interface.

Value – 16.

The `rtrv-atm-lps` command shows parameter values that cannot be configured with the `chg-atm-lps` command. These values are:

`SDU SIZE` – The maximum size, in octets, of the **SDU**

Value – 272

`UU SIZE` – The size, in octets of the **SSCOP UU**

Value – 4

`N` – The monitoring intervals needed to span the time when messages are not released from buffers as a result of a 400 millisecond error event.

Value – 9

`FCNR` – The moving credit increment value

Value – **NULL**

`FCBC` – The moving credit allocation frequency

Value – **NULL**

`TSUP` – The superblock timer value, in seconds

Value – 120

`TLOSS` – the stat loss limit timer value, in seconds

Value – 1.3

`ERMSM` – The exponential smoothing factor using in **ERM**

Value – 0.1

`THRES` – The threshold for comparing the running QoS computation by the **ERM**

Value – 0.244

For this example, the values **ATM** link parameter set 5 are being changed to these values.

maxcc = 8 **PDUs**

maxpd = 2000 **PDUs**

maxstat = 45 **PDUs**

tmrcc = 1500 milliseconds

tmrkalive = 500 milliseconds

tmrnorsp = 1000 milliseconds

tmrt1 = 10000 milliseconds

tmrt2 = 19000 milliseconds

tmrt3 = 3000 microseconds

n1 = 10000 **PDUs**

maxnrp = 7 attempts

tmrsrec = 750000 milliseconds

nblk = 6 monitoring intervals per block

1. Display the existing values for the ATM link parameter set being changed using the `rtrv-atm-lps` command specifying the link parameter set being changed. For this example, enter this command.

   `rtrv-atm-lps:lpset=5`

   This is an example of the possible output.

```
rlghncxa03w 06-10-28 16:02:05 GMT  EAGLE5 36.0.0
ATM LINK PARAMETER SET TIMERS AND PARAMETERS (REAL NUMBERS IN SECONDS)
                                SSCOP PARAMETERS
                              TMR  TMR     TMR    TMR   TMR
LPSET  MAXCC  MAXPD  MAXSTAT  CC   KALIVE  NORSP  POLL  IDLE
5      4      500    67       0.2  0.1     1.5    0.1   0.1

                                SSCF-NNI PARAMETERS
       TMRT1  TMRT2  TMRT3     N1
       05.0   120.0  0.000925  64552

                                SAAL PARAMETERS
       MAX  TMR     TNRNO  TMR  N    TMR
       NRP  SREC    CRED   ERM  BLK  PROV
       1    3600.0  1.5    0.1  3    0600.0

                          NONCONFIGURABLE PARAMETERS
       SDU   UU        FC   FC
       SIZE  SIZE  N   NR   BC   TSUP  TLOSS  ERMSM  THRES
       272   4     9   --   --   120   1.3    0.1    0.244
```

2. Change the values of the ATM link parameter set with the `chg-atm-lps` command specifying the link parameter set. For this example, enter this command.

```
chg-atm-
lps:lpset=5:maxcc=8:maxpd=2000:maxstat=45:tmrcc=1500 :tmrkal
ive=500:tmrnorsp=1000:tmrt1=10000:tmrt2=19000 :tmrt3=3000:n1
=10000:maxnrp=7:tmrsrec=750000:nblk=6
```

This message should appear.

```
rlghncxa03w 06-10-28 00:22:57 GMT  EAGLE5 36.0.0
CHG-ATM-LPS: MASP A - COMPLTD
```

3. Verify the changes using the `rtrv-atm-lps` command and the link parameter set specified in step 2. For this example, enter this command.

```
rtrv-atm-lps:lpset=5
```

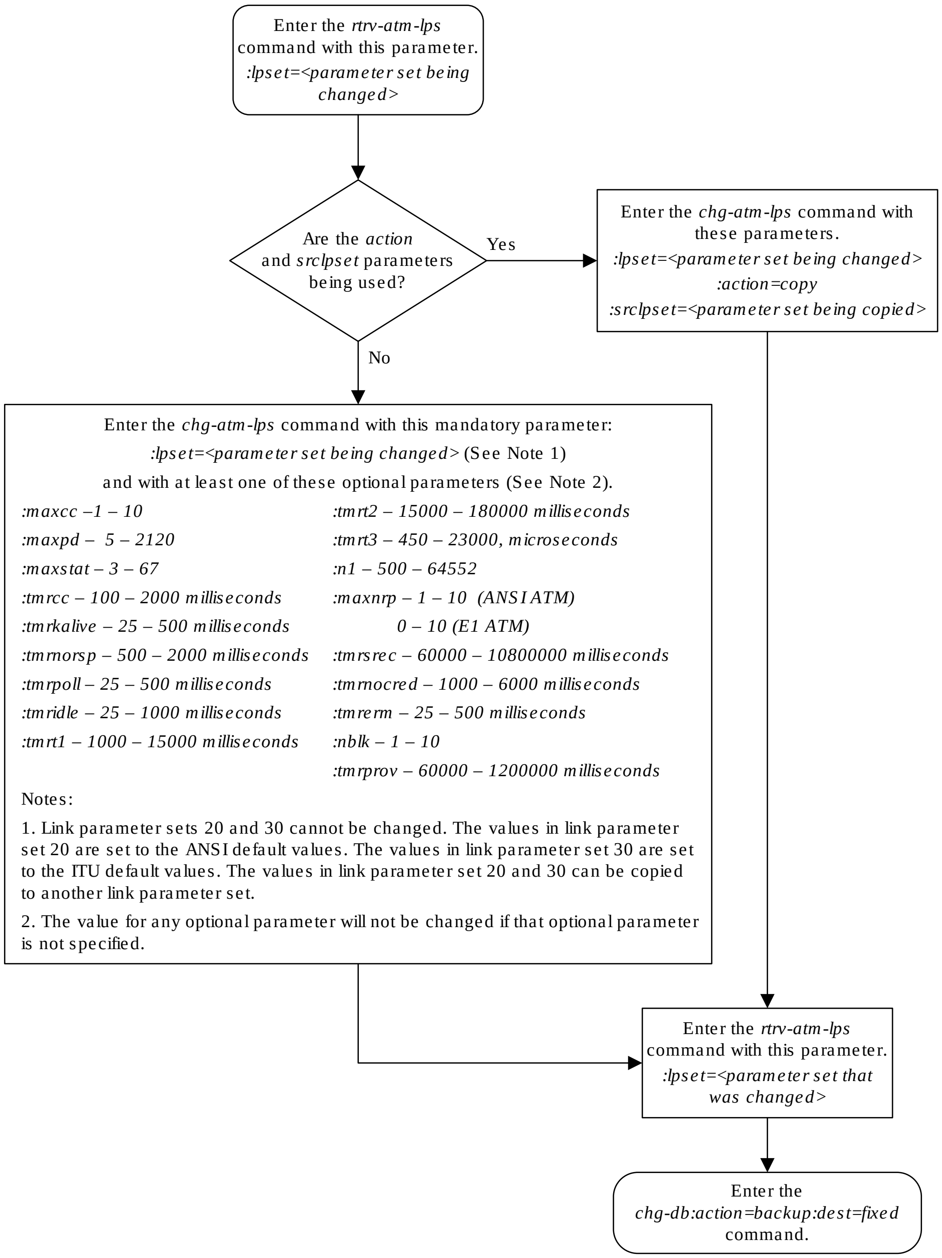
This is an example of the possible output.

```
rlghncxa03w 06-10-28 16:02:05 GMT  EAGLE5 36.0.0
ATM LINK PARAMETER SET TIMERS AND PARAMETERS (REAL NUMBERS IN
SECONDS)
                                  SSCOP PARAMETERS
                                TMR  TMR     TMR    TMR   TMR
LPSET  MAXCC  MAXPD  MAXSTAT   CC   KALIVE  NORSP  POLL  IDLE
5      8      2000   45        1.5  0.5     1.0    0.1   0.1

                                  SSCF-NNI PARAMETERS
       TMRT1  TMRT2  TMRT3     N1
       10.0   019.0  0.003000  10000

                                  SAAL PARAMETERS
       MAX  TMR     TNRNO  TMR  N    TMR
       NRP  SREC    CRED   ERM  BLK  PROV
       7    0750.0  1.5    0.1  6    0600.0

                            NONCONFIGURABLE PARAMETERS
       SDU   UU       FC  FC
       SIZE  SIZE  N  NR  BC  TSUP  TLOSS  ERMSM  THRES
       272   4     9  --  --  120   1.3    0.1    0.244
```

4. Back up the new changes using the `chg-db:action=backup:dest=fixed` command. These messages should appear, the active **Maintenance and Administration Subsystem** Processor (**MASP**) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk
complete.
```

Figure C-14 Changing an ATM High-Speed Signaling Link Parameter Set



D

Reference Information

Appendix D, Reference Information, contains the following information that is used by more than one procedure in this manual: Requirements for EAGLEs Containing more than 700 Signaling Links Determining the Number of High-Speed and Low-Speed Signaling Links

D.1 Requirements for EAGLEs Containing more than 1200 Signaling Links

To provision an EAGLE with more than 1200 signaling links (currently the EAGLE can have maximum capacities of 1200, 1500, 2000, or 2800 signaling links), the following additional requirements must be met:

- The Measurements Platform feature must be enabled. Perform these procedures in *Database Administration - System Management User's Guide* to enable the Measurements Platform Feature:
  - Adding an MCPM
  - Configuring the IP Communications Link for the Measurements Platform Feature
  - Adding an FTP Server
- To provision more than 1200 signaling links, the Large System # Links controlled feature must be enabled for 1500, 2000, or 2800 signaling links. For more information on enabling this feature, go to the Enabling the Large System # Links Controlled Feature procedure.

D.2 Determining the Number of High-Speed and Low-Speed Signaling Links

The EAGLE can contain these quantities of signaling links.

- The maximum number of IP signaling links (signaling links assigned to IPLIMx cards, IPGWx cards, or IPSG cards) or ATM high-speed signaling links (signaling links (signaling links assigned to cards running either **ATMANSI** or **ATMITU** applications), is limited by the total provisioned system **TPS** (transactions per second). If the HIPR2 High Rate Mode feature is not enabled or turned on, the total provisioned system TPS is 500,000 TPS. If the HIPR2 High Rate Mode feature is enabled and turned on, the total provisioned system TPS is 1,000,000 (1M) TPS. The total provisioned system TPS is shown in the `rtrv-tps` output. The EAGLE supports these quantities.
  - 187 IPLIMx cards with each card supporting 4000 TPS. An IPLIMx card can contain up to 16 signaling links. For more information about configuring an IPLIMx signaling link, see the "Adding an IPLIMx Signaling Link" procedure in *Database Administration - IP7 User's Guide*. The EAGLE can support a maximum of 250 IPLIMx cards but not all the IPLIMx cards can contain provisioned signaling links.

  - 187 IPGWx cards with each card supporting 4000 TPS. An IPGWx card can contain one signaling link. For more information about configuring an IPGWx signaling link, see the "Adding an IPGWx Signaling Link" procedure in *Database Administration - IP7 User's Guide*. The EAGLE can support a maximum of 250 IPGWx cards if the TPS that is assigned to some of the IPGWx cards is less than 4000, and there are no other types of cards are in the database other than the control cards.
  - 150 IPSG cards with each card supporting 5000 TPS. An IPSG card can contain up to 32 (128 for SLIC) signaling links. For more information about configuring an IPSG signaling link, see the "Adding an IPSG M2PA Signaling Link" procedure or "Adding an IPSG M3UA Signaling Link" procedure in *Database Administration - IP7 User's Guide*. The EAGLE can support a maximum of 250 IPSG cards if the TPS that is assigned to some of the IPSG cards is less than 5000, and there are no other types of cards are in the database other than the control cards.
  - The amount of TPS for an ANSI ATM high-speed signaling link is 1630. The amount of TPS for an ITU ATM high-speed signaling link is 2038. The EAGLE supports a maximum of 460 ANSI ATM high-speed signaling links and a maximum or 368 ITU ATM high-speed signaling links.
- A maximum of 80 unchannelized **E1** signaling links. An HC MIM can contain two unchannelized E1 signaling links. An E5-E1T1 card can contain one unchannelized E1 signaling link.
- A maximum of 180 unchannelized T1 signaling links. An unchannelized T1 signaling link can be assigned only to an E5-E1T1 card. An E5-E1T1 card can contain one unchannelized T1 signaling link.

The EAGLE can contain a maximum of 250 cards. This quantity does not include the control cards. The sum of the quantities of the signaling links shown in this list cannot be provisioned in the EAGLE as the EAGLE cannot contain enough cards to support the sum of the quantities of these signaling links.

Other signaling links, not shown in this list, can be provisioned if there is space in the shelves for the cards that support these signaling links, and the enabled signaling link quantity is not exceeded.

This hardware is the only hardware that is supported for an EAGLE containing 2001 to 2800 signaling links.

- **E5-E1T1-B**
- **E5-ATM-B**
- **E5-SM8G**
- **E5-ENET-B**
- **E5-STC** card for the EAGLE 5 Integrated Monitoring Support feature