Tekelec EAGLE® 5
Signaling Application System

Release 34.4

Feature Notice

TEKELEC

Table of Contents

Introduction

The EAGLE 5 SAS Release 34.4 documentation is based on Release 34.0 and documents additional functionality for the Triggerless Access SAM Handling (TASH) feature. The TASH feature is described in this document.

For an overview of Release 34.0 features, refer to the Feature Notice for Release 34.0, which is included in this documentation set.

Feature notices are distributed to customers with each new release of software.

The *Feature Notice* includes a brief feature overview, lists new hardware required if any, provides the hardware baseline for this release, and explains how to find the *Release Notice* and other customer documentation on the Customer Support Site for Release 34.4 (see "How to Locate Documentation on the Customer Support Site" on page FN-11).

New Features

The EAGLE® 5 Signaling Application System (SAS) Release 34.4 introduces the following new feature:

- "Triggerless Access SAM Handling" on page FN-2

Important Operational Changes

- "New or Changed UIMs" on page FN-6
- "Error Codes" on page FN-7

Triggerless Access SAM Handling

Overview

This feature enables service providers to invoke previously developed triggerless applications after completing the Called Party Number that provide:

- Blocking or allowing a call based on the Called or Calling Party Number

- Charging for intra-switch calls

- Prepaid calling services

Description

The triggerless application requires a complete Called Party Number. The ISUP Digit Collection Application (IDCA) is used to complete the Called Party Number before invoking the triggerless applications.

Switches operating in the overlap mode that use ISUP signaling send an Initial Address Message (IAM) that contain the Called Party Number digits followed by a Subsequent Address Message (SAM) (or SAMSs) containing the remaining digits.

Switches operating in the overlap mode that use Telephony User Part (TUP) signaling send a TUP Inital Address Additional Information (IAI) that contains the initial Called Party Number digits, followed by a TUP SAM or Subsequent Address Octet (SAO) that contains the remaining Called Party Number digits.

The EAGLE 5 SAS along with the IDCA completes the Called Party Number digits from an IAM/IAI and the related one or more SAM/SOA messages before processing the IAM for Triggerless applications. The EAGLE 5 SAS uses an adjunct Tekelec 1000 Applications Server to host the IDCA. The IDCA assembles and completes the Called Party Number of the IAM/IAI before invoking the Triggerless applications.

Complete Called Party Number

On receipt of an IAM, the EAGLE 5 SAS determines if the Called Party Number is complete. The EAGLE 5 SAS uses a table that includes the maximum length of the Called Party Number based on the leading digits.

- If the Called Party Number is complete, the EAGLE 5 SAS invokes the Triggerless application by sending the message to the Screening Call Service (SCS).

- If the Called Party Address is not complete, the EAGLE 5 SAS (along with the IDCA) stores the IAM/IAI and waits for the related SAM/SAO.

- If the EAGLE 5 SAS receives a SAM with the same OPC, DPC and CIC as that of a stored IAM, the EAGLE 5 SAS extracts the subsequent address from the

SAM and appends the Called Party Number of the stored IAM. The EAGLE 5 SAS compares the length of Called Party Number with the provisioned length for the leading digits to decide if the Called Party Number is complete. When the Called Party Number is complete, the EAGLE 5 SAS invokes the Triggerless application by sending the message to the SCS.

Hardware Requirements

A Tekelec 1000 Application Server is required to run the IDCA software application.

See "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Limitations

The TASH feature can only be enabled via a valid part number (**pn**) or feature name.

The IDCA is limited to 3000 messages (IAM/SAM/REL) per second.

The IAM Filter List is limited to 250 entries.

The measurements platform cannot be on if the TASH feature is enabled.

The Gateway Screening feature must be on prior to enabling the TASH feature.

Enhancements to Existing Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your release.

Common Screening List commands—The **chg**-/**ent**-/**dlt**-/**rtrv**-**csl** commands are used to change, enter, or delete lists of numbers or point codes used for screening messages in various features.

The **ent**-**csl** command enters a digit string into the Common Screening List (CSL). Each entry is identified by a feature name or part number which specifies the particular feature associated with the list, a list name which identifies a screening list used by the feature, and a digit string (**ds**) which identifies the unique screening number to be used.

- The **part number** parameter (pn) or **feature** parameter (feature name) identify the particular enabled screening feature for which the digit string will be associated.

- The **list** parameter (list name) is a mandatory parameter which is used to specify an associated list for the specified feature.

- The **digit string** parameter (ds) value identifies a unique string of digits used for the specified screening feature.

CSL Command Parameters	Range of Values	Default Value
digit string (ds)	1 to 6 digits [0-9, a-e, A-E, none]	n/a
p1	1 to 32 min value =1 max value=32	8
p2	0 = Regular 2 = IN Prefix	n/a

The p1 parameter can only be specified if p2=0 (Regular).

If p2=2 (IN Prefix), the p1 parameter cannot be specified.

The **rtrv-csl** command is used to display the existing entries from a Common Screening List (CSL).

- The specified **list** parameter value must be valid for the specified screening feature.

- The specified screening list entry must exist in the screening list that is used by the feature.

Example output for rtrv-csl

rtrv-csl:feature="TASH":list=iam

```
    telemar 05-07-04 20:24:17 EST   EAGLE5 34.4.0


    TASH
    IAM Filter
    DS                Number Len Number Typ
    ---------------   ---------- ----------
    8                 8          0
    123               2          0
    234               12         0
    1234              8          0


    IAM Filter table is (4 of 250) 1% full
;
```

Controlled Features commands— The **enable-/chg-/rtrv-ctrl-feat** commands are used to enable and turn on the feature, and display the status of the enabled feature (on or off).

> **NOTE: This feature uses a Permanent Key that cannot be turned off once turned on.**

Example output for rtrv-ctrl-feat

The **rtrv-ctrl-feat** command is used to display the status of all Controlled Features that have been purchased and enabled in the system.

> **NOTE:** **The following output example will differ from the output shown at your terminal and might include features that are not supported in your system.**

rtrv-ctrl-feat

```
telemar 05-07-04 20:24:17 EST  EAGLE5 34.4.0
The following features have been permanently enabled:

Feature Name             Partnum     Status    Quantity
IPGWx Signaling TPS      893012805   on        2000
ISUP Normalization       893000201   on        ----
Command Class Management  893005801   on        ----
LNP Short Message Service 893006601  on        ----
Prepaid SMS Intercept Ph1 893006701  on        ----
Intermed GTT Load Sharing 893006901  on        ----
G-Port Circ Route Prevent 893007001  on        ----
XGTT Table Expansion     893006101   on        400000
XMAP Table Expansion     893007710   on        3000
Large System # Links     893005910   on        2000
Routesets                893006401   on        6000
EAGLE5 Product           893007101   off       ----
EAGLE Product            893007201   off       ----
IP7 Product              893007301   off       ----
Network Security Enhance  893009101   off       ----
TASH                     893016301   on        ----
```

Alarms

New or Changed UAMs

No new Unsolicited Alarm Messages (UAMs) are necessary to support this release.

New or Changed UIMs

New Unsolicited Information Messages (UIMs) added for this release are listed in Table FN-1.

Table FN-1.   New UIMs for the Triggerless Access SAM Handling feature.

UIM #	UIM Format	Output Group	Text	Description / Corrective Action
1327	I8 (OPC-DPC)	Link	SCS (Redirect) PC Prohibited: Cannot Route	The SCS is prohibited, so messages that would be redirected to it are sent to their original destination.
1328	I8 (OPC-DPC)	Link	IDCA not provisioned for network type	The IDCA must be provisioned in the remote appl table for the network type (ANSI, ITU-I, ITU-N, ITU-N24)
1329	I8 (OPC-DPC)	Link	IDCA not reachable for network type	The IDCA is prohibited, so MSUs that would have been routed there are sent to their original destination

New or Changed Hardware Verification Codes

No new or changed Hardware Verification Codes are required to support this release.

UAM Format Changes

No UAM Format changes are required to support this release.

UIM Format Changes

No UIM Format changes are required to support this release.

Error Codes

Incorrect use of the enhanced commands for the Triggerless Access SAM Handling (TASH) feature may generate the error messages listed in Table FN-2.

Table FN-2.   Error Messages - TASH feature

Response ID Code	Error Message	New?	Used by Command:
E2068	This feature is not compatible with the Measurements Platform.	N	enable-ctrl-feature
E3524	INP feature must be ON	N	enable-ctrl-feature
E4339	Common screening list feature invalid	N	chg-/dlt-/ent-csl
E4340	Common screening list key invalid	Y	chg-/dlt-/ent-csl
E4358	Common screening list feature is required	N	chg-/dlt-/ent-csl
E4359	Common screening list type is required	N	chg-/dlt-/ent-csl
E4360	Common screening list type is invalid	N	chg-/dlt-/ent-csl
E4361	Common screening list entry already exists	N	chg-/dlt-/ent-csl
E4362	Common screening list entry not present	N	chg-/dlt-csl
E4364	Common screening list invalid parameter combination	N	chg-/dlt-/ent-csl
E4366	Common screening list is full	N	ent-csl
E4367	Common screening list read fail	N	chg-/dlt-/ent-csl
E4489	Common screening list starting digits of key must be unique	Y	chg-/dlt-/ent-csl
E4492	Common screening list invalid DS parameter value	N	chg-/dlt-/ent-csl
E4493	After: Common screening list DS length invalid	Y	chg-/dlt-/ent-csl
E4499	After: Common screening list invalid parameter value	Y	chg-/dlt-/ent-csl

Customer Documentation

Documentation Set

The documentation set for EAGLE 5 SAS Release 34.4 comprises the following manuals and documents. The list is sorted by manual name and is followed by a brief description of each manual.

> **NOTE: The most current update of each manual can be found on Tekelec's Customer Support website.**

- *Commands Error Recovery Manual*

- *Commands Manual*

- *Database Administration Manual – Features*

- *Database Administration Manual – Gateway Screening*

- *Database Administration Manual – Global Title Translation*

- *Database Administration Manual – IP7 Secure Gateway*

- *Database Administration Manual – SS7*

- *Database Administration Manual – System Management*

- *Hardware Manual – Tekelec 1000 Application Server*

- *Maintenance Manual*

- *Release Documentation*

  - *Release 34.0 Feature Notice**

  - *Release 34.4 Feature Notice*

  - *Master Glossary*

  - *Release Notice (online only)*

  - *System Overview*

* The EAGLE 5 SAS Release 34.4 documentation is based on Release 34.0. The EAGLE 5 SAS Release 34.4 documentation set includes two Feature Notices, one for Release 34.4, and one for Release 34.0. The Feature Notice for Release 34.4 provides an overview of the Triggerless Access SAM Handling (TASH) feature. The Feature Notice for Release 34.0 provides an overview of the features included in Release 34.0.

Commands Error Recovery Manual

The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.

Commands Manual

The *Commands Manual* contains procedures for logging into an EAGLE 5 SAS system, logging out of the system, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.

Database Administration Manual – Features

The *Database Administration Manual – Features* contains procedural information required to configure an EAGLE 5 SAS or an IP[7] Secure Gateway system to implement these features: X.25 Gateway, STP LAN, Database Transport Access, GSM MAP Screening, and EAGLE 5 SAS Support for Integrated Sentinel.

Database Administration Manual – Gateway Screening

The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 SAS or IP[7] Secure Gateway system to support this feature.

Database Administration Manual – Global Title Translation

The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 SAS or an IP[7] Secure Gateway system to implement these features: Global Title Translation, Enhanced Global Title Translation, Variable Length Global Title Translation, Interim Global Title Modification, and Intermediate GTT Load Sharing.

Database Administration Manual – IP[7] Secure Gateway

This manual contains procedural information required to configure the system to implement the SS7-IP Gateway.

Database Administration Manual – SS7

The *Database Administration Manual – SS7* contains procedural information required to configure an EAGLE 5 SAS or an IP[7] Secure Gateway system to implement the SS7 protocol.

Database Administration Manual – System Management

The *Database Administration Manual – System Management* contains procedural information required to manage the EAGLE 5 SAS's database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.

Hardware Manual – Tekelec 1000 Application Server

The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Applications Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures used to physically install the Tekelec 1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

EAGLE 5 SAS Release 34.4 includes an ISUP Digit Collection Application (IDCA) hosted on a Tekelec 1000 Application Server. The procedures and drawings needed for installing the hardware are included in the *Hardware Manual - Tekelec 1000 Application Server.*

Maintenance Manual

The *Maintenance Manual* contains procedural information required for maintaining the EAGLE 5 SAS system and the IP^7 Secure Gateway system. The *Maintenance Manual* provides preventive and corrective maintenance procedures used to maintain the different systems.

Release Documentation

The *Release Documentation* is a release-specific compilation of the following documents:

- *Feature Notice* - Describes the features contained in the specified release; also provides the hardware baseline, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.

- *Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.

- *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The final Release Notice provides a list of Generic Program Loads (GPLs), problems identified and resolved in a build, and all known problem reports.

    NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support Website to provide you with instant access to the most up-to-date release information.

- *System Overview* - Provides high-level information on SS7, the IP^7 Secure Gateway, system architecture, LNP, and EOAP.

How to Locate Documentation on the Customer Support Site

Access to Tekelec's Customer Support area is restricted to current Tekelec customers. This section describes how to log into Tekelec's Customer Support site and how to locate customer documentation. Viewing these files requires Adobe Acrobat Reader.

1   Go to Tekelec's Customer Support login page at
     https://support.tekelec.com/index.asp

2   Enter your assigned username and chosen password, then click **Go.**

     Or, if you do not have access to the Customer Support site, click **Need an Account?**

     Follow the instructions on the screen.

     NOTE: After 20 minutes of inactivity, you will be logged off, and you must repeat this step to regain access.

3   After successful login, select a product from the Product Support drop-down menu.

4   Select a release number from the Product Support Release drop-down menu.

5   Locate the appropriate documentation section (i.e., a Feature Notice would be under **Notices,** and user documentation would be under **Manuals**).

6   To open the documentation in the same window, double click the document name. To open the documentation in a new window, right-click the document name and select **Open in New Window**.

7   To download the document, right-click the document name and select **Save Target As**.

Customer Training

Tekelec offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate and maintain the EAGLE 5 SAS. To enroll in any of the courses or for schedule information, contact the Tekelec Training Center at (919) 460-3064 or E-mail **eagletrain@tekelec.com**.

A complete list and schedule of open enrollment can be found at **www.tekelec.com**.

Tekelec Customer Care Center

The Tekelec Customer Care Center offers a point of contact through which customers can receive support for problems that may be encountered during the use of Tekelec's products. The Tekelec Customer Care Center is staffed with highly trained engineers to provide solutions to your technical questions and issues seven days a week, twenty-four hours a day. A variety of service programs are available through the Tekelec Customer Care Center to maximize the performance of Tekelec products that meet and exceed customer needs.

Technical Assistance

To receive technical assistance, call the Tekelec Customer Care Center at one of the following locations:

- Tekelec, Europe and UK

  Phone: +44 1784 467 804

  Fax: +44 1784 477 120

  Email: *ecsc@tekelec.com*

- Tekelec, USA

  Phone (within the continental US) 1 888-FOR-TKLC
         (outside the continental US) +1 919-460-2150

  Fax: +1 919 460 0877

  Email: *support@tekelec.com*

When your call is received, the Customer Care Center issues a Customer Service Report (CSR). Each CSR includes an individual tracking number. When a CSR is issued, the Customer Care Center determines the classification of the trouble. The CSR contains the serial number of the system, problem symptoms, and messages. The Customer Care Center assigns the CSR to a primary engineer, who will work to solve the problem. The Customer Care Center closes the CSR when the problem is resolved.

If a critical problem exists, the Customer Care Center initiates emergency procedures (see the following topic, "Emergency Response").

Emergency Response

If a critical service situation occurs, the Tekelec Customer Care Center offers emergency response twenty-four hours a day, seven days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure a rapid resolution to the problem.

A critical situation is defined as an EAGLE 5 SAS problem that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service or system operation, resulting in:

- Failure in the system that prevents transaction processing

- Reduction in system capacity or in system traffic-handling capability

- Inability to restart the system

- Corruption of the database

- Inability to perform maintenance or recovery operations

- Inability to provide any required critical or major trouble notification

- Any other problem severely affecting service, capacity, traffic, and billing. Maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Appendix A. Acronyms and Terminology

BCSM—Basic Call State Model

CdPN—Called Party Number

CgPN—Calling Party Number

CSL—Common Screening List The common screening list commands can be used to change, enter, or delete lists of numbers or point codes used for screening messages in various features. The IDP Relay feature can screen up to 4 lists.

CSL CCNDC—The list of prefixes that have a Country Code (CC) and a Network Code (NDC) for which the IDP Relay is applicable.

CSL SKBCSM—The list of concatenated string of service key (SK) and basic call state model (BCSM) parameter for which the IDP Relay is applicable.

DEFCC—The default country code parameter in the existing STPOPTS table.

DLTPFX—Delete Prefix

DN—Dialed Number or Directory Number

DRA—Destination Routing Address

DS—Digit String

DSM—Database Service Module

EIR—Equipment Identity Register

FAK—Feature Access Key

GPL—Generic Program Load

GTT—Global Title Translation

IAI—Initial Address Additional Information

IAM—Initial Address Message

DCA—Digit Collection Application is a software application that runs on an adjunct Tekelec 1000 Applications Server and is used to complete the Called Party Number.

IDP—Initial Detection Point

IDP Query—IDP is the INAP "Initial Detection Point" message. This message comes in a TCAP Begin package and is referred to as an IDP Query message.

IN Prefix—Intelligent Network Prefix, pre pended to 'Regular' E164 number in the IAM message to route the IAM to the SSP.

INP—INAP Number Portability

ISUP—ISDN User Part

LRN—Location Routing Number

M3UA—Message Transfer Part (MTP3) – User Adaptation Layer.

NCDPNPFX—New Called Party Number Prefix

NI—Network Indicator

NP—Number Portability

Out Of Area Number—Regular number that is not part of the NP Serving Area e.g. A call placed to subscriber in another country.

PDB—Provisioning Database

REL—Release Message

RLC—Release Complete

RN—Routing Number

SAM—Subsequent Address Message

SAO—Subsequent Address Octet

SCCP—Signaling Connection Control Part

SCS—Screening Call Service

SI—Service Indicator

SK—Service Key

SN—Subscriber Number

SNAI—Service Nature of Address Indicator

SRI—Send Routing Information

ST—End of Pulsing Signal a.k.a Stop Digit

SUA—SCCP User Adaptation Layer

TASH—Triggerless Subsequent Address Message Handling

TPS—Transactions Per Second

TUP—Telephony User Part

UAM—Unsolicited Alarm Message

UIM—Unsolicited Information Message

VSCCP—VxWorks Signaling Connection Control Part

Appendix B. Hardware Baseline

The following hardware baseline supports this release. This list shows top-level part numbers (in bold) and assembly part numbers (if applicable).

- Control Shelf   **870-2321-02 Rev A**[1] or
  Control Shelf   **870-2321-04 Rev A**[2] or
  Control Shelf   **870-2377-01 Rev A**[3]

- Control Shelf Backplane   **870-0775-03 Rev E**

- Extension Shelf   **870-2378-01 Rev A**[4]
  Extension Shelf   **870-0776-02 Rev C**[5]
  Extension Shelf   **870-0776-03 Rev D**
  Extension Shelf   **870-0776-06 Rev A**
  Extension Shelf   **870-0776-07 Rev A**

- Extension Shelf Backplane   **870-0776-08 Rev A** or
  Extension Shelf Backplane   **870-0776-11 Rev A**

- ACM   **870-1008-02 Rev D** or
  ACM   **870-1008-03 Rev A** or
  ACM   **870-1008-04 Rev A** or
  ACM   **870-1008-05 Rev A**

- Air Management Card   **870-1842-01 Rev A**[6]

- DCM   **870-1945-03 Rev A**

- DCM   **870-1945-01 Rev A**
  DCM   **870-1945-02 Rev A**

- EDCM   **870-2371-01 Rev E**

- EDCM (single-slot)   **870-2372-01 Rev E**

- DCMX   **870-1984-01 Rev A**

- DSM, 1GB MEM   **870-1984-02 Rev A** or
  DSM, 2GB MEM   **870-1984-03 Rev A** or
  DSM, 3GB MEM   **870-1984-04 Rev A** or
  DSM, 4GB MEM   **870-1984-05 Rev A**[7]

- DSM-1G   **870-2371-02 Rev A**

- EDSM-2G (MCPM)   **870-2372-03 Rev A**

- E1/T1 MIM   **870-2198-01 Rev G or**
  E1/T1 MIM   **870-2198-02 Rev A**

- E1-ATM   **870-2455-01 Rev B**
  E1-ATM   **870-2455-02 Rev B**

---

[1] Required for HMUX.
[2] Required for HMUX, Standard Frame
[3] Required for HMUX, Heavy Duty Frame
[4] Required for Heavy Duty Frame
[5] Required for Standard Frame
[6] Required for shelves with HC-MIM Cards
[7] Required for 192 Million LNP Numbers

- EILA　　　　　　　　　　　　　　　**870-2049-01 Rev A** or
  EILA w/ DIMM　　　　　　　　　　**870-2049-02 Rev A**

- FAP　　　　　　　　　　　　　　　**870-1606-02 Rev C**[1] [2] or
  FAP　　　　　　　　　　　　　　　**870-2320-01 Rev J**[3] [4]

- FAP-CF/EF　　　　　　　　　　　　**870-0243-08 Rev C**
  FAP-MISC　　　　　　　　　　　　　**870-0243-09 Rev C**

- GPSM-II　　　　　　　　　　　　　**870-2360-01 Rev E**

- HC-MIM　　　　　　　　　　　　　**870-2671-01 Rev P**

- HC-MIM　　　　　　　　　　　　　**870-2671-02 Rev A**

- HIPR　　　　　　　　　　　　　　　**870-2574-01 Rev D**

- HMUX　　　　　　　　　　　　　　**870-1965-01 Rev A**

- LIM-AINF　　　　　　　　　　　　　**870-1014-01 Rev D** or
  LIM-AINF　　　　　　　　　　　　　**870-1014-02 Rev A** or
  LIM-AINF　　　　　　　　　　　　　**870-1014-03 Rev B** or
  LIM-AINF　　　　　　　　　　　　　**870-1014-04 Rev A** or
  LIM-AINF　　　　　　　　　　　　　**870-1014-05 Rev A** or
  LIM-AINF　　　　　　　　　　　　　**870-1014-06 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-01 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-02 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-03 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-04 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-05 Rev A** or
  LIM-AINF w/ DIMM　　　　　　　　**870-1488-06 Rev A**

- LIM-ATM　　　　　　　　　　　　　**870-1293-02 Rev A** or
  LIM-ATM　　　　　　　　　　　　　**870-1293-03 Rev A**
  LIM ATM　　　　　　　　　　　　　**870-1293-06 Rev A**
  LIM ATM　　　　　　　　　　　　　**870-1293-07 Rev A**
  LIM-ATM　　　　　　　　　　　　　**870-1293-08 Rev A**

- LIM-DS0　　　　　　　　　　　　　**870-1009-02 Rev D** or
  LIM-DS0　　　　　　　　　　　　　**870-1009-03 Rev A** or
  LIM-DS0　　　　　　　　　　　　　**870-1009-04 Rev A** or
  LIM-DS0 w/ DIMM　　　　　　　　　**870-1485-01 Rev A** or
  LIM-DS0 w/ DIMM　　　　　　　　　**870-1485-02 Rev A** or
  LIM-DS0 w/ DIMM　　　　　　　　　**870-1485-03 Rev A**

- LIM-E1　　　　　　　　　　　　　　**870-1379-01 Rev A**

- IM-ILA　　　　　　　　　　　　　　**870-1484-01 Rev E** or
  LIM-ILA w/ DIMM　　　　　　　　　**870-1484-02 Rev C**

- LIM-OCU　　　　　　　　　　　　　**870-1010-03 Rev D** or
  LIM-OCU　　　　　　　　　　　　　**870-1010-04 Rev A** or
  LIM-OCU　　　　　　　　　　　　　**870-1010-05 Rev A** or
  LIM-OCU w/ DIMM　　　　　　　　　**870-1486-02 Rev A** or
  LIM-OCU w/ DIMM　　　　　　　　　**870-1486-03 Rev A** or
  LIM-OCU w/ DIMM　　　　　　　　　**870-1486-04 Rev A**

---

[1] Required for Standard Frame
[2] Required for Frames with HC-MIMs
[3] Required for Heavy Duty Frame
[4] Required for Frames with HC-MIMs

- LIM-V.35   **870-1012-02 Rev D**
  LIM-V.35   **870-1012-03 Rev A**
  LIM-V.35   **870-1012-04 Rev A**
  LIM-V.35 w/ DIMM   **870-1487-01 Rev A** or
  LIM-V.35 w/ DIMM   **870-1487-02 Rev A** or
  LIM-V.35 w/ DIMM   **870-1487-03 Rev A**

- MDAL   **870-0773-04 Rev B** or
  MDAL   **870-0773-05 Rev A** or
  MDAL   **870-0773-06 Rev A** or
  MDAL   **870-0773-08 Rev A**

- MPL   **870-2061-01 Rev A**
  MPL-T   **870-2061-02 Rev C**

- MPS TekServer EPAP   **890-1801-01 Rev D**

- MPS Sun Netra ELAP   **890-1374-06 Rev A**

- TDM   **870-0774-10 Rev A** or
  TDM   **870-0774-11 Rev A**

- TDM GTI   **870-0774-15 Rev B**

- TSM-256   **870-1289-02 Rev A** or
  TSM-256   **870-1289-03 Rev A**

- TSM-512   **870-1290-02 Rev A** or
  TSM-512   **870-1290-03 Rev A**

- TSM-768   **870-1291-02 Rev A** or
  TSM-768   **870-1291-03 Rev A**

- TSM-1024   **870-1292-02 Rev A** or
  TSM-1024   **870-1292-03 Rev A**

- Dual GR-376 EOAP   **890-1050-02 Rev G**

- Single EOAP   **890-1050-03 Rev H**

- Dual EOAP   **890-1050-01 Rev K**

- Kit, E1   **890-1037-01 Rev A**

- Kit, Holdover Clock Assy   **890-1013-01 Rev A**

- Fan Assy (Standard Frame)   **890-1038-01 Rev D**

- Fan Assy (Heavy Duty Frame)   **890-1038-02 Rev A**

- Fan Assy (Shelves with HC-MIM cards) **890-0001-01 Rev A**

- MPS Sun Netra ELAP   **890-1277-04 Rev G**

- Sun Netra ELAP   **890-1374-04 Rev E**

- T1000 Application Server   **870-2640-01 Rev F**

  - Dual Port G-Bit E-Net Card   **870-2707-01 Rev B**

  - Quad Serial Exp. Card   **870-2708-01 Rev B**

  - 120 GB Hard Drive Assy   **870-2721-02 Rev B**

- Upgrade kit, MPS Netra-to-T1000 AS   **870-2735-01 Rev A**