Sun microsystems

StorageTek™
Expert Library Manager

Software

User's Guide

Expert Library Manager

User's Guide

Version 6.2

MVS

PN 316105001

Revision A

We welcome your feedback. Please contact the Sun Learning Solutions Feedback System at SLSFS@Sun.com or

> Sun Learning Services
> Sun Microsystems, Inc.
> One StorageTek Drive
> Louisville, CO 80028-3256
> USA

Please include the publication name, part number, and edition number in your correspondence if they are available. This will expedite our response.

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Potential equipment damage: Cables that connect peripherals must be shielded and grounded; refer to descriptions in the cable instruction manuals. Operation of this equipment with cables that are not shielded and not correctly grounded might result in interference to radio and TV reception.

Changes or modifications to this equipment that are not expressly approved in advance by StorageTek will void the warranty. In addition, changes or modifications to this equipment might cause it to create harmful interference.

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The following compliance statement pertains to Federal Communications Commission Rules 47 CFR 15.105:

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This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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English translation: This is a Class A product based on the Technical Requirement of the Voluntary Control Council for Interference by Information Technology (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take corrective actions.

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English translation: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

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Internal Code Notice

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   (ii) transfer of possession of the Equipment to another party, StorageTek and its authorized service providers shall have the right with respect to the affected Equipment to remove all service tools and manuals and to remove or disable all Maintenance Code and/or replace Microcode which includes both Internal Code and Maintenance Code with Microcode that consists only of Internal Code.

Revision History

EC	Date	Description
132874	March 2007	Revision A

About this Guide

Expert Library Manager (ExLM) is MVS host software that manages Nearline and VSM resources. ExLM 6.2.0 provides the enhancements described in "What's New in This Guide?" on page xiii.

Intended Audience

This guide is for StorageTek or customer personnel who are responsible for configuring and administering ExLM.

Prerequisites

To perform the tasks described in this guide, you should already understand the following:

- MVS or OS/390 operating system
- NCS
- VTCS
- Your tape management system
- Operational requirements of your site for scratch volumes, free cells, and remote vaulting

Reader's Comments

If you have comments on this book, please e–mail us at **slsfs@sun.com** and include the document title and number with your comments.

About the Software

This guide applies to ExLM Version 6.2.0.

How this Guide is Organized

This guide contains the following sections:

What's New in This Guide?

ExLM 6.2 adds the following features:

- The ExLM Eject Utility function has been replaced with enhancements to `Action Eject`. The ExLM Eject Utility will be removed after this release.

- New and enhanced ExLM control statements. **Note that**:

  - ExLM 6.2 control statements provide similar function to selected HSC (`SLUADMIN`) and VTCS (`SWSADMIN`) utilities.

  - A new form of the Condition clause for volume selection is available where either a value or a range of values works with the condition to select volumes.

  - ExLM 6.2 is updated to issue a warning message when `EQ` and `NE` is specified with a field specified for comparison that represents a data set name and the specified string constant contains wild-card characters. For example:

    WHEN(DataSetName EQ 'SYSBACK.')**

    WHEN(DataSetName NE 'SYSBACK.')**

    A warning message is written to the parameter file listing to document the applied change.

    If the comparison operator is `LT`, `LE`, `GT`, or `GE`, a syntax warning (or error) message is issued because such characters are illegal in a properly formed data set name.

  - New volume fields are available. For more information, see *ExLM Quick Reference*.

Table 1. on page xv describes the ExLM 6.2 control statements.

Table 1. ExLM 6.2 Control Statements

ExLM Control Statement	6.2 Status	Corresponding HSC or VTCS Utility
`ACTION CONSOLIDATE`	Enhanced	`SWSADMIN CONSOLIDATE`
`ACTION EJECT`	Enhanced	`SLUADMIN EJECT`
`ACTION EXPORT`	Enhanced	`SWSADMIN EXPORT`
`ACTION MIGRATE`	Enhanced	`SWSADMIN MIGRATE`
`ACTION MOVE`	Enhanced	`SLUADMIN MOVE`
`ACTION RECALL`	Enhanced	`SWSADMIN RECALL`
`ACTION RECLAIM`	New	`SWSADMIN RECLAIM`
`ACTION SCRATCH`	New	`SLUADMIN SCRATCH`
`ACTION UNSCRATCH`	New	`SLUADMIN UNSCRATCH, SLUADMIN REPLACEALL`
`DATASET`	Enhanced	
`LOCATION`	Unchanged	
`MANAGE PHYSICAL`	Unchanged	
`MANAGE VIRTUAL`	Unchanged	
`METHOD`	Enhanced	
`OPTIONS`	Enhanced	
`OPTIONS SYNC and SYNCVTV MANAGE PHYSICAL and MANAGE VIRTUAL`	Unchanged	`SLUCONDB (and SMC equivalent)`
`PULLLIST`	Unchanged	
`REPORT CELLCNT`	Unchanged	
`REPORT CONSOLIDATE`	Unchanged	
`REPORT DATASET`	Unchanged	
`REPORT EJECT`	Unchanged	
`REPORT ENTER`	Unchanged	
`REPORT EXPORT`	Unchanged	
`REPORT LSM`	Enhanced	
`REPORT MIGRATE`	Unchanged	

Table 1. ExLM 6.2 Control Statements

ExLM Control Statement	6.2 Status	Corresponding HSC or VTCS Utility
REPORT MULTIPLE	New	SWSADMIN MVCRPT
REPORT NONSCRCNT	Unchanged	
REPORT OPERATOR	Unchanged	
REPORT PHYSICAL	New	SLUADMIN VOLRPT
REPORT RECALL	Unchanged	
REPORT SCRCNT	Unchanged	
REPORT SUMMARY	Unchanged	
REPORT VIRTUAL	New	SWSADMIN VTVRPT
REPORT VOLUME	Enhanced	
SET METHOD	Enhanced	
SUBPOOL	Enhanced	
SUBPOOL and MANAGE PHYSICAL BALSCR	Unchanged	SLUADMIN SCRATCH REDISTRIBUTION
TMS CA1	Enhanced	
TMS COMMON	Enhanced	
TMS CTT	Enhanced	
TMS CUSTOM	Enhanced	
TMS OPEN	Enhanced	
TMS RMM	Enhanced	
TMS TLMS	Enhanced	
UNMANAGED	Enhanced	

- ExLM 6.2 adds the LISTDD and LISTDSN parameters to selected ACTION statements. Specified as an alternative to a WHEN condition, the LISTDD and LISTDSN parameters specify a file containing the list of volsers to use for the statement.

- ExLM 6.2 supports IF REQ statements in PTFs when necessary to identify requisite HSC or VTCS maintenance.

- ExLM 6.2 provides failover capability for ExLM Agent. You can now specify multiple Agent host/port pairs on the AGENT keyword of the TMS statements. The specified host/port pairs are tried in order until a successful connection is made or the list of hosts is exhausted. If none of the Agents can be contacted, a WTOR message says that no Agents can be contacted.

What's New for ExLM Explorer in Version 6.2?

- ExLM Explorer is enhanced to support all new features as described in Table 1. on page xv.

- Additional fields are available for reports and selection criteria.

- You can now specify an external list of items as an alternative to specifying selection rules for Action objects and Custom reports.

- You can now specify multiple hosts for the ExLM Agent. ExLM tries each Agent in the list until a successful connection can be made or the end of the list is reached. This provides a failover capability when ExLM obtains tape management system information from a remote host.

- You can now specify whether volumes ejected from an SL8500 library are ejected in the sequence determined by the hardware to provide for the least robotic motion or in the sequence specified by ExLM.

- Three new Action object types have been added: Action Scratch, Action Unscratch, and Action Reclaim. These replace the SLUADMIN Scratch, SLUADMIN Unscratch, and SWSADMIN Reclaim functions.

- Four new report types have been added: Multiple, MVC_VTV, Physical, and Virtual. These report on MVCs, MVC-VTV combinations, physical volumes in an LSM, and VTVs, respectively. These replace the SWSADMIN MVCRPT, SLUADMIN VOLRPT, and SWSADMIN VTVRPT functions.

- You can generate text strings in custom report columns and headings based on the run-time evaluation of complex expressions.

- You can now use substrings in comparisons of text fields, such as CreationJobName and DataSetName.

Related Publications

The following publications provide additional information about ExLM, VSM, and NCS.

ExLM

The ExLM documentation set consists of the ExLM Information CD-ROM, which contains PDF file formats of the following publications:

- *ExLM Installation and Maintenance Guide*
- *ExLM User's Guide* (*formerly ExLM System Administrator's Guide*)
- *ExLM Messages and Codes*
- *ExLM Quick Reference*

VTCS and VSM

The VTCS and VSM documentation set consists of he VTCS Information CD-ROM, which contains PDF file formats of the following books:

- *Introduction to VSM*
- *VTCS Installation and Configuration Guide*
- *VTCS Administrator's Guide*
- *VTCS Messages and Codes*
- *VTCS Command and Utility Reference*
- *VTCS Quick Reference*

NCS

NCS Installation Guide

HSC-MVS Environment

- *Configuration Guide*
- *Operator's Guide*
- *System Programmer's Guide*
- *Messages and Codes*
- *System Programmer's Reference Summary*
- *Operator's Reference Summary*
- *NCS/VTCS XML Guide*

SMC

- *Configuration and Administration Guide*

LibraryStation

- *Configuration Guide*
- *Operator and System Programmer's Guide*
- *Messages and Codes*

MVS/CSC

- *Configuration Guide*
- *Operator Guide*
- *System Programmer Guide*
- *Messages and Codes*

Conventions for Reader Usability

Conventions are used to shorten and clarify explanations and examples within this book.

Typographic   The following typographical conventions are used in this book:

- **Bold** is used to introduce new or unfamiliar terminology.

- `Letter Gothic` is used to indicate command names, filenames, and literal output by the computer.

- **`Letter Gothic Bold`** is used to indicate literal input to the computer.

- *`Letter Gothic Italic`* is used to indicate that you must substitute the actual value for a command parameter. In the following example, you would substitute your name for the "username" parameter.

- Logon *username*

- A bar (|) is used to separate alternative parameter values. In the example shown below either username or systemname must be entered.

- Logon *username|systemname*

- Brackets [ ] are used to indicate that a command parameter is optional.

- Ellipses (...) are used to indicate that a command may be repeated multiple times.

- The use of mixed upper and lower case characters (for non–case sensitive commands) indicates that lower case letters may be omitted to form abbreviations. For example, you may simply enter **Q** when executing the **Quit** command.

Keys   Single keystrokes are represented by double brackets [[ ]] surrounding the key name. For example, press [[ESC]] indicates that you should press only the escape key.

Combined keystrokes use double brackets and the plus sign (+). The double brackets surround the key names and the plus sign is used to add the second keystroke. For example, press [[AL]] + [[C]] indicates that you should press the alternate key and the C key simultaneously.

Enter Command   The instruction to "press the [[ENTER]] key" is omitted from most examples, definitions, and explanations in this book.

For example, if the instructions asked you to "enter" **Logon pat**, you would type in **Logon pat** *and* press lENTERm.

However, if the instructions asked you to "type" **Logon pat**, you would type in **Logon pat** and you would *not* press [[ENTER]].

Symbols   The following symbols are used to highlight text in this book.

Warning: Information necessary to keep you from damaging your hardware or software.

Caution: Information necessary to keep you from corrupting your data.

Hint: Information that can be used to shorten or simplify your task or they may simply be used as a reminder.

Note: Information that may be of special interest to you. Notes are also used to point out exceptions to rules or procedures.

Syntax   Syntax flow diagram conventions include the following:

Flow Lines—Syntax diagrams consist of a horizontal baseline, horizontal and vertical branch lines and the command text. Diagrams are read left to right and top to bottom. Arrows show flow and direction.

Single Required Choice—Branch lines (without repeat arrows) indicate that a single choice must be made. If one of the items to choose from is on the baseline of the diagram, one item must be selected.
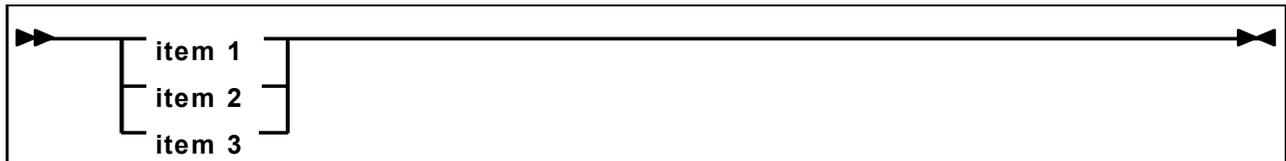
Single Optional Choice—If the first item is on the line below the baseline, one item may optionally be selected.
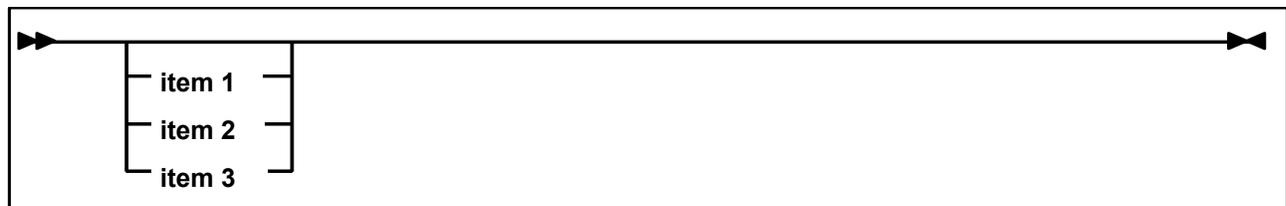
Defaults—Default values and parameters appear above the baseline.
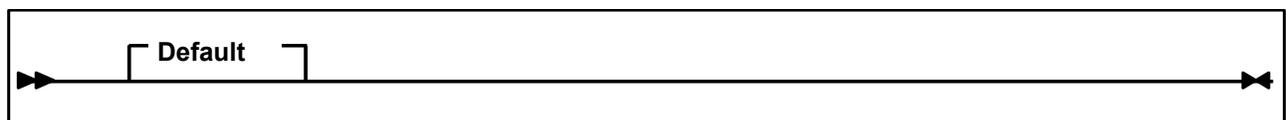
Repeat Symbol—A repeat symbol indicates that more than one choice can be made or that a single choice can be made more than once. The repeat symbol shown in the following example indicates that a comma is required as the repeat separator.

```
         ,
►►──┬── variable ──┬──────────────────────────────────────────►◄
```

Keywords—All command keywords are shown in all upper case or in mixed case. When commands are not case sensitive, mixed case implies that the lowercase letters may be omitted to form an abbreviation.

Variables—Italic type is used to indicate a variable.

Alternatives—A bar (|) is used to separate alternative parameter values.

Optional—Brackets [ ] are used to indicate that a command parameter is optional.

Delimiters—If a comma (,), a semicolon (;), or other delimiter is shown with an element of the syntax diagram, it must be entered as part of the statement or command.

Ranges—An inclusive range is indicated by a pair of elements of the same length and data type, joined by a dash. The first element must be strictly less than the second element.

```
►►──┬── items 1-3 ──┬──────────────────────────────────────────►◄
    ├── items 4-6 ──┤
    └── items 7-9 ──┘
```

Lists—A list consists of one or more elements. If more than one element is specified, the elements must be separated by a comma or a blank and the entire line must be enclosed by parentheses.

```
►►──┬── (items 1,2) ──┬─────────────────────────────────────────►◄
    ├── (items 4,5) ──┤
    └── (items 6,7) ──┘
```

Additional Information

Sun Microsystems, Inc. (Sun) offers several methods for you to obtain additional information.

Sun's External Web Site
Sun's external Web site provides marketing, product, event, corporate, and service information. The external Web site is accessible to anyone with a Web browser and an Internet connection.

The URL for the Sun external Web site is: http://www.sun.com

The URL for Sun StorageTek™ brand-specific information is: http://www.storagetek.com

Customer Resource Center
The Sun StorageTek product Customer Resource Center (CRC) is a Web site that enables members to resolve technical issues by searching code fixes and technical documentation for StorageTek brand products. CRC membership entitles you to other proactive services, such as HIPER subscriptions, technical tips, answers to frequently asked questions, addenda to product documentation books, and online product support contact information. Customers who have a current warranty or a current maintenance service agreement may apply for membership by clicking on the `Request Password` button on the CRC home page. Sun employees may enter the CRC through the SunWeb PowerPort.

The URL for the CRC is http://www.support.storagetek.com

Partners Site
The StorageTek Partners site is a Web site for partners with a StorageTek Partner Agreement. This site provides information about products, services, customer support, upcoming events, training programs, and sales tools to support StorageTek Partners. Access to this site, beyond the Partners Login page, is restricted. On the Partners Login page, Sun employees and current partners who do not have access can request a login ID and password and prospective partners can apply to become StorageTek resellers.

The URL for the StorageTek Partners site is: http://members.storagetek.com

The URL for partners with a Sun Partner Agreement is: http://www.sun.com/partners/

Hardcopy Publications
Contact a Sun sales or marketing representative to order additional paper copies of this publication or to order other StorageTek brand product customer publications in paper format.

Customer Support

Customer support is available 24 hours a day, seven days a week, to customers with Sun or StorageTek maintenance contracts and to Sun employees. You can find additional information about customer support on the Customer Resource Center (CRC) Web site at:

http://www.support.storagetek.com

Requesting Help with Software

A publication that is sent to customers using Sun StorageTek software is called *Requesting Help from Software Support*. This book outlines the customer support provided by the Sun StorageTek Software Support organizations for software and it details the process and guidelines for getting help with Sun Sto

Customer-initiated Maintenance

Customer-initiated maintenance begins with a telephone call from you to Sun Microsystems StorageTek Support. You receive immediate attention from qualified Sun personnel, who record problem information and respond with the appropriate level of support.

To contact Sun Microsystems StorageTek Support about a problem:
1. Use the telephone and call:

   ☎ **800.525.0369** (inside the United States)

   ☎ **303.673.4056** (outside the United States)
2. Describe the problem to the call taker. The call taker will ask several questions and will either route your call to or dispatch a support representative.

If you have the following information when you place a service call, the process will be much easier:

Account name	
Site location number	
Contact name	
Telephone number	
Equipment model number	
Device address	
Device serial number (if known)	
Urgency of problem	
Fault Symptom Code (FSC)	
Problem description	

Sun's Worldwide Offices

You may contact any of Sun's worldwide offices to discuss complete storage, service, and support solutions for your organization. You can find address and telephone number information on Sun's external Web site at:

http://www.sun.com/worldwide/

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Chapter 1. ExLM Overview

Expert Library Manager (ExLM) is MVS host software that manages Nearline and VSM resources. ExLM also includes ExLM Explorer, a graphical user interface that you can use to configure ExLM by creating configuration files instead of parameter files.

ExLM 6.2.0 adds the features described in "" on page xix.

ExLM Management Services for Nearline Systems

ExLM can provide the following management services for Nearline systems:

- Maintain sufficient levels of scratch volumes by:

    - Distributing scratch volumes across LSMs within an ACS.

    - Synchronizing a volume's HSC scratch status with the tape management system (TMS) scratch status.

ExLM can also mark a volume as "unscratch" to HSC even if it is defined as scratch to the TMC. This feature lets you maintain a reserve of scratch volumes

that HSC does not select for scratch mounts until you use ExLM to mark them as scratch to HSC.

- Ejecting scratch volumes that have been marked defective by the TMS.

- Requesting additional scratch volumes on the Enter Report.

- Maintain sufficient levels of free cells by:

  - Ejecting excess scratch volumes and less active data volumes.

  - Distributing free cells across LSMs within an ACS.

- Maintain sufficient levels of cleaning cartridges.

- If desired, manage LSM contents (scratch volumes, nonscratch volumes, and free cells) by individual LSMs or by groups (which can be divided into subgroups) of LSMs.

- ExLM can also manage LSMs as a hierarchy. For example, ExLM can:

  - "Promote" the most active data volumes by moving them up to LSMs higher in the hierarchy.

  - "Demote" less active data volumes by moving them down to LSMs lower in the hierarchy, which creates free cells in LSMs higher in the hierarchy.

  - Maintain scratch levels in LSMs higher in the hierarchy by "promoting" scratch volumes to these LSMs.

- Concentrate operator tasks (entering and removing volumes) around specific time periods (such as at the beginning of each shift or during periods of low activity). For example, a job scheduler can generate a "pull list" of volumes required for an

upcoming production run. ExLM adds any pull list volumes not in the ACS to the Enter Report, and frees cells needed for these volumes.

- Support multi-volume data sets. If all volumes in a multi-volume data set have the same ExLM management method, ExLM will manage all volumes together. If these volumes have different management methods, ExLM will manage them individually.

- Provide standard and customized LSM and volume reports. ExLM also maintains log files that log ExLM actions.

- Provide the ability to do ad hoc volume ejects (`ACTION EJECT`), moves (`ACTION MOVE`), scratches (`ACTION SCRATCH`), and unscratches (`ACTION UNSCRATCH`).

ExLM Management Services for VSM Systems

ExLM provides the following management services for VSM systems:

- Manages subpools that contain VTVs (defined as `MEDIA(VIRTUAL)`).

- Synchronizes a VTV's HSC scratch status with the TMS scratch status via the `OPTIONS` statement `SYNCVTV` parameter.

- Manages MVCs.

- Displays VTV and MVC information on consolidation, migrate, recall, scratch counts, nonscratch counts, summary reports, and custom volume, MVC, and VTV reports.

- Consolidates, migrates, recalls, scratches, and unscratches VTVs, including the ability to do these actions *ad hoc* via the `ACTION` statement.

- Exports VTVs and MVCs.

How Does ExLM Work?

ExLM runs as a batch job. You specify the job processing options by creating parameter files with a text editor or by creating configuration files with the ExLM Explorer GUI. You can also create an ExLM Agent to provide access to TMS information from multiple hosts without the use of shared DASD. ExLM provides reports that you can use to monitor resource status, and a log file of ExLM actions.

Hint: ExLM Explorer 5.0.0 and above provides the ability to submit ExLM batch jobs via a **Submit...** choice in the context menus for **Run** objects. For more information, see the Explorer help information.

For physical volumes, ExLM uses information from the TMS to:

- Determine a volume's scratch status.
- Select scratch volumes for entry into the ACS.
- Determine a volume's last time of reference.
- Determine if a volume is externally managed.
- Manage volumes by data set name or location code.

For VTVs, ExLM uses information from the TMS to determine a VTV's scratch status and also extracts information directly from HSC and VTCS to display VSM information and manage VSM resources (the flat file interface is no longer required with NCS and VTCS 4.0.0 and above).

ExLM supports multiple TMSs, and checks them in the order you specify. A volume is controlled by the first TMS that references the volume. You can also use ExLM to manage volumes that are not under TMS control, and in this case, ExLM uses information from the HSC CDS instead.

ExLM uses the SMC Uniform User Interface (UUI) to communicate with HSC to request scratch updates, ejects, moves, and the last mounted date for data volumes.

You can use the ExLM operator commands to do the following:

- Start and stop ExLM.

- Display ExLM status, ejects completed and remaining, moves completed and remaining, VTV consolidation status, export status, migrate and recall status, and MVC reclaim status.

- Redirect ejects from one CAP to another.

- Pause and resume CAP activity, volume moves, VTV consolidations, exports, migrates and recalls, and MVC reclaims.

Figure 1 shows an ExLM configuration.
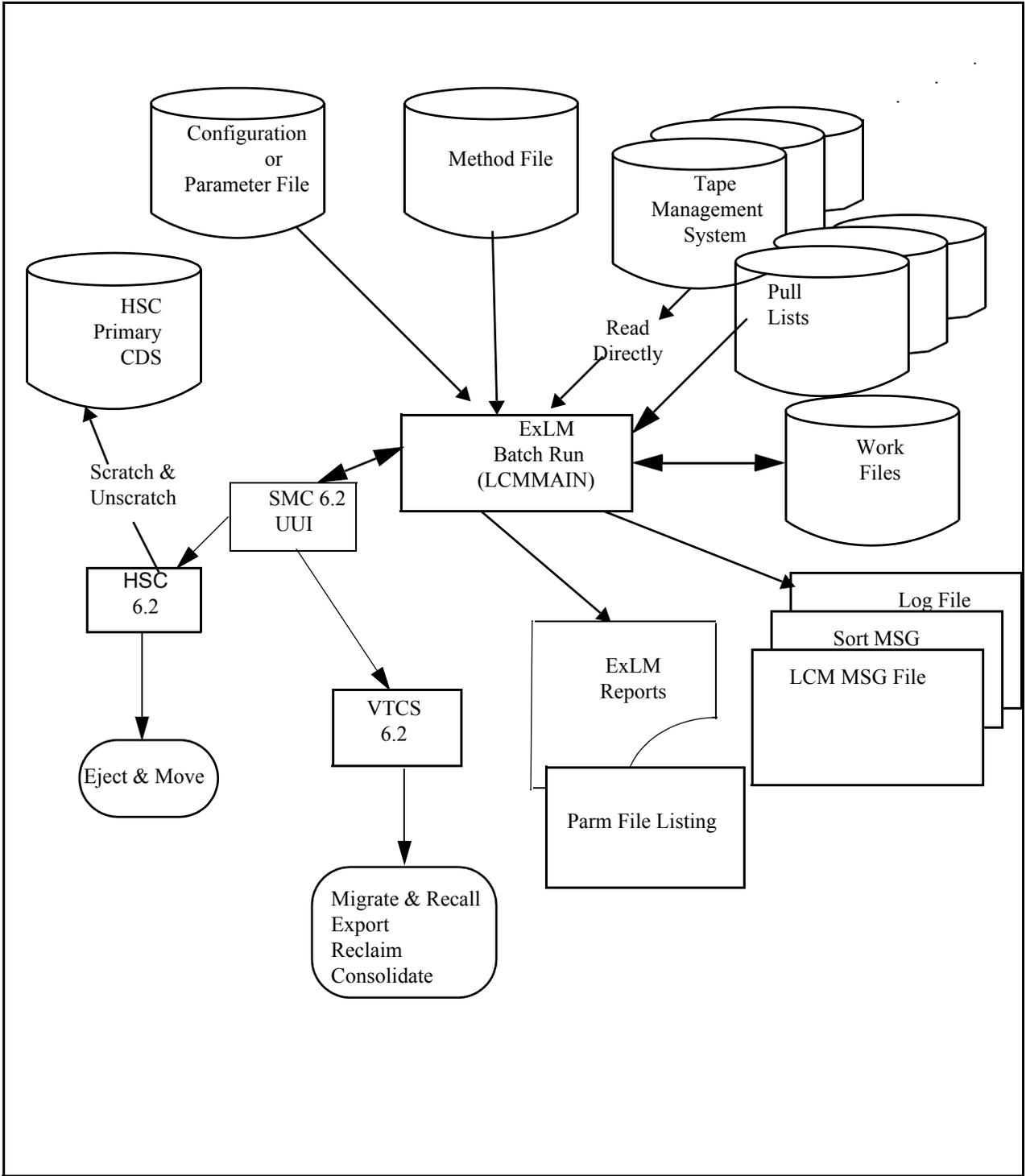
Figure 1. ExLM Processing

As Figure 1 on page 6 shows, ExLM manages resources as follows:

1. Loads library configuration data from the HSC CDS.

2. Reads the ExLM processing options from the parameter file or configuration file.

3. Processes the HSC VOLDEF file.

4. Reads volume information from the CDS.

5. Reads Pull List information.

6. Reads volume information from the TMS and does the following:

   • Marks HSCUNSCR volumes as non-scratch.

   • Does scratch synchronization (for ACS-resident Nearline tape volumes and VTVs managed by a TMS).

7. Reads the Method File for individual volser overrides.

8. Applies content management rules from the ExLM configuration.

9. Optionally produces pre-action reports.

10. Ejects and moves physical volumes.

11. Produces post-action reports.

12. Consolidates, migrates, and recalls VTVs.

13. Reclaims MVCs.

14. Exports VTVs and MVCs.

Chapter 2. Using ExLM to Manage Nearline and VTCS Resources

This chapter tells how to use ExLM to manage your Nearline and VTCS resources as described in the following sections:

- "ExLM Usage Considerations" on page 10
- "ExLM Parameter Files" on page 11
- "Creating an ExLM Batch Job" on page 27
- "Using ExLM to Manage Nearline Resources" on page 33
- "Using EXLM to Manage VSM Resources" on page 35

ExLM Usage Considerations

As described in "ExLM Management Services for Nearline Systems" on page 1, ExLM can help you manage your Nearline system resources. For example, ExLM can maintain sufficient levels of scratch volumes, cleaning cartridges, and free cells, and balance or distribute these levels across LSMs in a multi-LSM Nearline system.

The management policies you create with ExLM, such as specifying free cell levels, are site-specific decisions. For example, in general, you want to have as many volumes as possible in your LSMs, because free cells are unused storage capacity. However, you need to maintain some free cells to allow cartridge enters and volume movements between LSMs. In addition, in a multi-LSM system, you should probably maintain more free cells in the LSMs where you do most cartridge enters.

For Nearline systems, your planning for ExLM should focus on how you use your ACS. How many scratch volumes do you use in an average day? Does your operations staff enter volumes throughout the day or only at the beginning of a day or shift? Do you move volumes to off-site vaults and if so, when do you move these volumes? What times are best for operators to enter and eject volumes? Which are your most active data volumes, and which volumes can reside outside the ACS? Which CAPs do you want to use for volume ejects? To answer these questions, use information from one or more of the following resources:

- If you are considering an ACS purchase, your StorageTek representative can analyze your proposed ACS configuration for ExLM usage.

- For an existing ACS, use TMS and HSC reports. For more information about HSC reports, see *HSC System Programmer's Guide*.

- Use MVS system data. For example, you can use SMF type 15 to estimate the average number of scratch mounts that occur during each shift or during a normal day.

- If you already have ExLM, you can use ExLM reports to help plan for changes to your Nearline system. See '"ExLM Reports" on page 14 for more information.

Hint: ExLM can help make your operations more flexible via the ACTION statement that allow you to do *ad hoc* tasks. For more information, see "ExLM ACTION Control Statements" on page 18.

ExLM Parameter Files

ExLM parameter files specify how you use ExLM to:
- Manage resources, for example:

    - Read the TMS for updated volume scratch status and do HSC scratch synchronization.

    - After a TMS run:

        - Eject volumes destined for vaulting.

        - Ensure sufficient scratch volumes in the ACS.

    - Create free cells before a large number of volume entries.

    - Eject data volumes and request scratch volume enters if scratch or free cell shortages occur.

    - Eject all scratch volumes in a subpool within a managed LSM to retire that subpool.

- Generate ExLM reports on Nearline and VSM resources as described in "ExLM Reports" on page 14.

- Do *ad hoc* tasks including Nearline volume moves and ejects; VTV consolidations, exports, migrations, and recalls; and scratches and unscratches of Nearline volumes and VTVs.

Note: You can, of course, combine functions within single parameter file. For example, one parameter file can do TMS-HSC scratch synchronization, scratch and free cell balancing, ejects for vaulting, and report on the results. The ExLM SAMPLIB contains sample parameter files that you can customize for your system; for more information, see Appendix A, "ExLM SAMPLIB Members" on page 357.

Hint: You can convert parameter files into an ExLM Explorer configuration file, where each parameter file is a different Run object within the configuration file.   For more information, start Explorer and see the "Migrating to ExLM Explorer" help topics. You can use ExLM Explorer to create configuration files instead of parameter files; for more information, see the Explorer help information.

Note that the ExLM Explorer 5.0 and above configuration file has changed to an XML based format. ExLM XML based configuration files are compatible with ExLM 4.0 configuration files as follows:

- The mainframe component of ExLM 5.0 and above can read ExLM 4.0 configuration files.

- The 5.0 and above ExLM Explorer can read ExLM 4.0 configuration files, but it will always save them in the new format.

Caution: StorageTek recommends that you make a backup copy of your production configuration files from prior releases before saving them with the 6.2 and above ExLM Explorer in case you need to revert to ExLM from the prior level.

ExLM Management Control Statements

An ExLM parameter file can contain Management control statements that define management policies for your system resources.   For example, you can use the `MANAGE` statement to control the level of scratch volumes in your ACS and how they are distributed across LSMs. Control statements also define the reports ExLM produces.

The following list describes the ExLM Management control statements in their recommended order within a parameter file. As this ordering shows, you should create a resource before you refer to it in another statement. Also note that TMS(s) are read in TMS statement order and a volume is managed by the first statement that references it.

METHOD

> The `METHOD` statement defines an ExLM management method that can be assigned to nonscratch volumes. ExLM provides standard volume management methods, but you can use the `METHOD` statement to define additional methods. For example, you can define management methods that unconditionally eject volumes, eject them only to create free cells, or never eject them.

OPTIONS

> The `OPTIONS` statement defines global ExLM processing options. For example, the `OPTIONS` statement can specify a title used in all reports, the management method to use for HSC-only and externally managed volumes, and global values for volume scratch status management and defective media removal.
>
> You can create only one `OPTIONS` statement in each parameter file. The `OPTIONS` statement is optional; if not specified, ExLM uses the default values.

TMS

> The `TMS` statement defines a TMS to ExLM and selects processing options for that TMS.
>
> You should create a `TMS` statement for each TMS that controls volumes in the LSMs specified by the `MANAGE` statement.

PULLLIST

> The `PULLLIST` statement specifies a list of volumes that an operator must enter for an upcoming production run. ExLM uses the pull list to ensure that sufficient free cells exist for these volumes and lists them on an Enter Report.

LOCATION

> The `LOCATION` statement specifies a TMS volume location code, the management method, and eject options for data volumes associated with that location. You typically use a `LOCATION` statement to explicitly eject volumes for off-site vaulting.

DATASET

> The `DATASET` statement specifies a data set name, management method, and report production for data volumes associated with that data set.

SUBPOOL

> The SUBPOOL statement defines a volume subpool that you can use to qualify scratch criteria specified on the MANAGE statement. The SUBPOOL statement can also specify the TMS that manages the volumes in the subpool (or IGNORE for TMS-managed volumes not available to ExLM). You can also use the SUBPOOL statement to specify a management method for data volumes in the subpool.

REPORT

> The REPORT statement specifies ExLM reporting options. You can create multiple REPORT statements in a single parameter file to produce different reports, and you can also specify the same REPORT statements in different parameter files to produce comparison reports for different production runs.

SET METHOD

> The SET METHOD statement conditionally assigns management methods to volumes. The SET METHOD statement overrides any method previously assigned to those volumes by any other statement or option.

MANAGE

> The MANAGE statement specifies an LSM group and management policies for the volumes and free cells in the LSMs in the group. A MANAGE statement is required for ExLM to manage LSM contents.

> You can also use the MANAGE statement to define LSM group hierarchies. ExLM uses these hierarchies to use available free cells and volumes in LSM groups towards the bottom of the hierarchy to satisfy the requirements of LSM groups towards the top of the hierarchy. LSM group hierarchies can also optimize your use of ExtendedStore™ LSMs by placing them at the bottom level of the hierarchy where they can provide low cost storage of infrequently accessed data volumes and excess scratch volumes and cleaning cartridges.

> Similarly, you can use the MANAGE VIRTUAL statement to manage your VSM resources.

UNMANAGED

> The UNMANAGED statement specifies an LSM group that is not managed by ExLM. ExLM does not move, eject, or update HSC scratch status of the volumes in this LSM group. You can, however, produce reports for this LSM group.

ExLM Reports

ExLM reports, which can help you manage your system resources, are provided as three types:

- • "ExLM Standard Reports"
- • "ExLM Optional Reports" on page 16
- • "ExLM Custom Reports" on page 16

ExLM also provides report templates that you can customize to easily produce complex reports as described in "REPORT Statement Templates" on page 17.

ExLM Standard Reports

ExLM standard reports, which are produced by default by an ExLM batch job, meet many of your needs with little customization required. For example, to change the standard reports for your site's needs, you can specify the number of lines per page or, for some reports, the type of totals ExLM produces. The standard reports require a `MANAGE` statement in the parameter file, which produces reports with the parameters shown in Figure 2.

```
t operator    ddname(sysprint);

t scrcnt      ddname(sysprint) totals(standard);

t nonscrcnt   ddname(sysprint) totals(standard);

t cellcnt     ddname(sysprint) totals(standard);

t summary     ddname(sysprint);

t enter       ddname(sysprint);

t eject       ddname(sysprint);

t dataset     ddname(sysprint) for(report);

t consolidate ddname(sysprint);
```

Figure 2. Standard Report Structures

You can suppress the standard reports with the `SUPAUTORPT` option; for more information, see "SUPAUTORPT" on page 129.

Table 2 describes the ExLM standard reports.

Table 2. ExLM Standard Reports

Report Type	Contents	For more information, see...
CELLCNT	storage cell and volume status for a single LSM, LSM subgroup, LSM group, or entire ACS	"REPORT CELLCNT" on page 247
CONSOLIDATE	VTVs that ExLM consolidates onto consolidation MVCs for each consolidation group	"REPORT CONSOLIDATE" on page 252
EJECT	volumes that ExLM will eject for each LSM	"REPORT EJECT" on page 257
ENTER	volumes that must be entered for each LSM	"REPORT ENTER" on page 262
EXPORT	VTVs that ExLM will export	"REPORT EXPORT" on page 266
MIGRATE	VTVs that ExLM will migrate.	"REPORT MIGRATE" on page 270
NONSCRCNT	non-scratch volume counts and ejects, enters, and moves that ExLM will do for each LSM	"REPORT NONSCRCNT" on page 274
OPERATOR	describes actions, such as entering and removing volumes, the operator must do to complete ExLM content management	"REPORT OPERATOR" on page 279
RECALL	VTVs that ExLM will recall.	"REPORT RECALL" on page 283
SCRCNT	scratch volume counts and ejects, enters, and moves that ExLM will do for each LSM	"REPORT SCRCNT" on page 286
SUMMARY	summarizes LSM or VSM content and status	"REPORT SUMMARY" on page 292

ExLM Optional Reports

ExLM Optional Reports, unlike Standard Reports, are not automatically produced; you must specifically request them. Optional Reports have a fixed output, and default and specifiable selection criteria for report contents.

DATASET	data sets saved on volumes processed by ExLM	"REPORT DATASET" on page 297
MULTIPLE	MVC report	"REPORT MULTIPLE" on page 302
PHYSICAL	Nearline volume report	"REPORT PHYSICAL" on page 307
VIRTUAL	VTV report	"REPORT VIRTUAL" on page 312

ExLM Custom Reports

Custom Reports, which must be explicitly requested, provide both a wide range of selection criteria and output formats that can be ordered and sorted in many ways. Table 3 describes the ExLM custom reports.

Table 3. ExLM Standard Reports

Report Type	Contents	For more information, see...
LSM	customized reports of LSM content and status	"REPORT LSM" on page 318
MVC_VTV	customized reports of MVCs and VTVs	"REPORT MVC_VTV" on page 320
VOLUME	customized reports of ExLM-managed volumes	"REPORT VOLUME" on page 322

REPORT Statement Guidelines

The following are guidelines for REPORT statements:

- Reports print in the order that you code REPORT statements in a parameter file.

- You can do report-only runs for only the LSM, MVC_VTV, and VOLUME custom reports, and a MANAGE statement is not required in the parameter file.

- Specify FREE=CLOSE on the SYSPRINT DD statement to allow the report to print while ExLM is still executing.

- Use the DDNAME(*ddname*) or SYSOUT(*class*) parameter to specify the report destination (ddname or SYSOUT class).

- Use the TITLE(*text*) parameter to specify the title for each page of the report (maximum 70 characters). This title is printed below the OPTIONS TITLE text if specified.

REPORT Statement Templates

The REPORT PHYSICAL, REPORT MULTIPLE, and REPORT VIRTUAL statements generate an expanded listing in the parameter file showing the statements created for the appropriate Custom Report as described in Table 4.

Table 4. Expanded Listings Custom Reports

This Report statement generates...	...an expanded listing with this Report statement
REPORT MULTIPLE DETAIL	REPORT MVC_VTV
REPORT MULTIPLE	REPORT VOLUME
REPORT PHYSICAL	REPORT VOLUME
REPORT VIRTUAL	REPORT VOLUME

If you want to customize your reports more than is available with parameters on these reports, you can copy the expanded listings for the Custom Report to use as a template.

ExLM ACTION Control Statements

The ExLM `ACTION` statements do *ad hoc* actions, including Nearline volume moves and ejects; VTV consolidations, exports, migrations, and recalls; and scratches and unscratches of Nearline volumes and VTVs. The `ACTION` statements let you select volumes (physical or virtual) using any combination of fields and specify actions for the selected volumes.

The `ACTION` statement works alone or in combination with other ExLM statements. If an ExLM file contains a mixture of `ACTION` statements and `MANAGE` statements, ExLM first does actions specified by the `ACTION` statements, then does whatever additional actions, if any, are required to satisfy the `MANAGE` statements. For more information, see "ExLM Action Control Statements" on page 195.

Parameter File Syntax Requirements

ExLM parameter files have the following syntax requirements:

- Use columns 1-72 are for control statements.

- Begin each statement with the control statement name followed by parameters.

- Use spaces to separate the control statement name and parameters. Use blanks or commas to separate parameters.

- End each control statement with a semi-colon (;).

- Control statements can flow across lines anywhere spaces are permitted.

- You can specify control statements in lowercase, uppercase, or mixed case.

- Write comments in any of the following styles:

    - /* Comment */ Anywhere spaces are allowed. This style can span multiple lines.

    - *   Everything on this line.

    - ..parms; //   Anything from double slashes to end of line.

Subparameter Data Types

Data types and coding requirements for control statement subparameter values are defined as follows.

Character Data

alphabetic character
a letter A, B, ..., Z, in uppercase or lowercase, or a national character (#, @, or $).

numeric character
a decimal digit 0, 1, ..., 9.

alphanumeric character
an alphabetic character or a numeric character.

special character
any character other than an alphanumeric character, including the blank character.

Numeric Data

decimal number
a sequence of numeric characters.

hexadecimal number
a base sixteen number; a sequence of characters in which each character is a numeric character or a letter A, B, C, D, E or F, in uppercase or lowercase.

ExLM converts lowercase letters in a hexadecimal number to uppercase.

Textual Data

character string

any sequence of one or more alphanumeric or special characters.

If a character string contains a special character, put the string in single quotes ('). You may also code a null string. A null string is a character string that represents no characters, and is coded as two consecutive single quotes.

The length of a character string is equal to the number of characters represented by the string. The beginning and ending single quotes of a quoted string are not regarded as string data and do not count toward the length of the string.

ExLM converts lowercase letters in a character string to uppercase letters unless the string is put in single quotes; ExLM does not alter the case of characters coded in a quoted string.

A character string must be wholly contained on a single line of a parameter file.

If a subparameter value must be coded as a numeric value, a data set identifier, or a volser range, do not code the value as a quoted string.

Represent a single quote in a character string by coding two consecutive single quotes. The following is an example of how to code a character string that contains single quotes.

Example of Coding Single Quotes in a Character String

The string:

```
Tape 'vault'
```

must be coded as:

```
'Tape ''vault''
```

data set identifier

a character string that represents the names of one or more nongeneration data sets or represents the names of one or more generation data groups.

The true name of a nongeneration tape data set consists of a sequence of one or more qualifiers, each separated by periods. The true name of a generation tape data set consists of a base name and a generation identifier. A base name consists of a sequence of one or more qualifiers, each separated by periods, and identifies a family of cataloged data sets called a generation data group (GDG). The data sets of a GDG are called generation data sets.

A generation identifier is a suffix qualifier for a base name and has the form GnnnnVnn. The absolute generation number, nnnn, is a four-digit decimal number in the range 0001 through 9999. The version number, nn, is a two-digit decimal number in the range 00 through 99. A generation identifier identifies a version of a specific generation data set that belongs to the GDG identified by the base name. Only generation data set names have a generation identifier as a suffix qualifier.

The true name of a nongeneration data set may be coded as a data set identifier. For a generation data group, only the GDG base name may be coded as a data set identifier.

A data set identifier must be coded as a sequence of one or more qualifiers. If the sequence consists of two or more qualifiers, separate each qualifier by a period (.). Do not code a data set identifier as a string enclosed by single quotes.

A qualifier must be coded as a string that ranges in length from one to eight characters. Only characters that can be coded in an OS data set name may be coded as characters of a qualifier. For more information about OS data set names, refer to the IBM publication *JCL Reference* or *MVS Data Administration Guide* for your system.

Letters coded in a qualifier may be coded as lowercase or uppercase letters. ExLM converts lowercase letters in a qualifier to uppercase letters during execution. Do not code a qualifier as a string enclosed by single quotes.

By using wild cards, you can code a single data set identifier that represents more than one data set name. There are wild cards to represent qualifier characters, qualifier suffixes, whole qualifiers, sequences of qualifiers, and a whole data set name.

- The percent sign wild card (%) represents any single character of a qualifier.

  Each percent sign coded in a qualifier counts toward the length of the qualifier as one character.

- The asterisk wild card (*) can represent any qualifier or all suffixes of a qualifier.

  An asterisk coded as a whole qualifier represents any qualifier. An asterisk coded as a qualifier suffix represents all valid suffixes of the qualifier, including no suffix at all.

  An asterisk coded in a qualifier counts toward the length of the qualifier as one character, and may only be coded as the last character of a qualifier.

- The double asterisk wild card (**) can represent any sequence of qualifiers or all data set names.

  A double asterisk coded as a qualifier sequence may only be coded at the end of a data set identifier and represents all valid sequences of qualifiers, including no sequence at all. A double asterisk coded as a whole data set identifier represents all data set names.

  A double asterisk coded in a data set identifier counts toward the length of the data set identifier as two characters.

A data set identifier that does not contain a wild card represents either the true name of a specific nongeneration data set or the base name of a specific generation data group.

Unless a control statement syntax definition indicates otherwise, a data set identifier may consist of at most 44 characters, including periods, and may contain wild cards.

Shown in Figure 3 on page 23 are several examples of valid data set identifiers.

```
                        SYS1.ABCDEFGH.DATA

                        SYS1.%%%%%%%%.DATA

                        SYS1.%%%%%%%*.DATA

                        SYS%.A%C%E%G%.DATA

                        SYS%.ABCD*.DATA

                        SYS%.*.DAT*

                        SYS*.*.D%T*

                        SYS*.*.D%T*.**

                        SYS*.**

                        **
```

Figure 3. Examples of Valid Data Set Identifiers

Shown in Table 5 are several examples of improperly coded data set identifiers.

Table 5. Examples of Improperly Coded Data Set Identifiers

Invalid Data Set Identifier	Reason Identifier is Invalid
BACKUP..VOL123	A qualifier is missing.
BACKUP.VOL123.	A qualifier is missing.
BACKUP.%%%%%%%%%%.VOL123	There are more than eight characters coded in a qualifier.
BACKUP.%%%%%%%%*.VOL123	There are more than eight characters coded in a qualifier.
BACKUP.*TAPE.VOL123	The asterisk is not coded as the last character of a qualifier.
BACKUP.**.VOL123	The double asterisk is not coded at the end of the data set identifier.
BACKUP**	The double asterisk is not coded as a qualifier.
BACKUP1.TAPE.VOL123.G0255V00	The data set identifier contains a generation identifier.
'BACKUP1.TAPE.VOL123'	The data set identifier is enclosed by single quotes.

volser number
> identifies the volume serial number of a specific tape volume.
>
> Code a volser number as you would code any valid OS tape volume serial number. If you code a volser number that contains a special character or a lowercase letter, put the volser number in single quotes (').
>
> ExLM converts lowercase letters coded in a volser number to uppercase letters unless the volser number is put in single quotes; ExLM does not alter the case of characters coded in a quoted volser number.
>
> The number of characters coded in a volser number must not exceed six. ExLM stores all volser numbers internally as six-character volser numbers; if necessary, ExLM pads a volser number with trailing blanks to convert it to a six-character volser number. For example, ExLM would store the volser number 0000 internally as 0000bb (b represents the blank character).

volser range
> defines a range of consecutive tape volume serial numbers.
>
> Code a volser range as two volser numbers separated by a dash (-). The volser number coded ahead of the dash represents the first volume serial number of the range, and the other volser number represents the last volume serial number of the range. Do not code a volser range as a string enclosed by single quotes.
>
> Both volser numbers of a range must contain a sequence number portion and may optionally contain other characters. ExLM regards the rightmost decimal numeric field within a volser as the sequence number position.
>
> Code each sequence number portion as a one- to six-digit decimal number. The sequence number portion of both volser numbers must have the same number of digits and must be coded within the volser numbers at the same position. The magnitude of the first sequence number of a range must not be greater than the magnitude of the last sequence number of the range.
>
> Other characters coded optionally in the volser numbers of a range must correspond exactly, by position and by value.

Shown in Table 6 are several examples of valid volser ranges.

Table 6. Examples of Valid Volser Ranges

Valid volser range	Sequence number portion	
	First volser number	Last volser number
X0Z555-X0Z777	555	777
X00Z30-X00Z60	30	60
X444ZZ-X800ZZ	444	800
000VOL-999VOL	000	999
000000-200000	000000	200000
6000-6500	6000	6500
'vol1id'-'vol9id'	1	9

Shown in Table 7 are several examples of improperly coded volser ranges.

Table 7. Examples of Improperly Coded Volser Ranges

Invalid Volser Range	Reason Volser Range is Invalid
2000-0000	The starting sequence number (2000) is of a greater magnitude than the ending sequence number (0000).
VOL1-VOL100	The sequence numbers (1 and 100) do not have the same number of digits.
HH00XX-H99HXX	The sequence numbers (00 and 99) are not at the same positions; consequently, the non sequence number characters do not correspond.
VOL001-TAP999	The non sequence number characters (VOL and TAP) are not identical.
V00L00-V00X00	The non sequence number characters (L and X) are not identical.
X1Z555-X2Z777	The non sequence number characters (1 and 2) are not identical.
VOLAAA-VOLZZZ	Neither volser number has a sequence number portion.
'X0Z555-X0Z777'	The volser range is enclosed by single quotes.

For information about using alphabetic volsers, see "NCS/VTCS Alphabetic Volsers" on page 381.

ExLM Fields

As described in *ExLM Quick Reference,* ExLM provides you with a panoply of fields you can use to generate reports, supercharge your `ACTION` statements, and so forth. Anywhere a field occurs, you can also code the `SUBSTR` function to reference a portion of a field as follows:

SUBSTR(*field*,*position*[,*length*]).

field
> The field from which to obtain a substring. This must be a field of type character.

position
> The starting position of the substring within field. Position is required and must be between 1 and the length of the field's value.

length
> The length of the substring within field. Length is optional. If length is not specified, the remainder of the value starting at position is returned.

Creating an ExLM Batch Job

You create and submit an ExLM batch job, which specifies a parameter file or Explorer configuration file, to specify how ExLM manages your system resources and which reports ExLM produces. You typically run ExLM batch jobs at the following times:

- After the daily TMS run to eject volumes for vaulting, establish scratch volume levels, and establish free cell levels.

- After entering volumes, to synchronize scratch status.

- To alleviate scratch or free cell shortages.

- To retire a subpool.

- To eject volumes associated with specific data sets.

- To eject volumes for placement in assigned vault locations.

- To provide service levels.

- To produce before and after LSM contents reports.

For more information about creating an ExLM batch job, see the following sections:

- "JCL EXEC Statement" on page 28

- "Required and Optional JCL DD Statements" on page 30

- "Using ExLM to Manage Nearline Resources" on page 33

- "Using EXLM to Manage VSM Resources" on page 35

Hint: `SAMPLIB` member `LCMRUN` is a sample ExLM batch job. ExLM Explorer 5.0.0 and above provides the ability to submit ExLM batch jobs via a **Submit...** choice in the context menus for **Run** objects. For more information, see the Explorer help information.

JCL EXEC Statement

This section describes the JCL `EXEC` statement used to submit an ExLM batch job.

Syntax
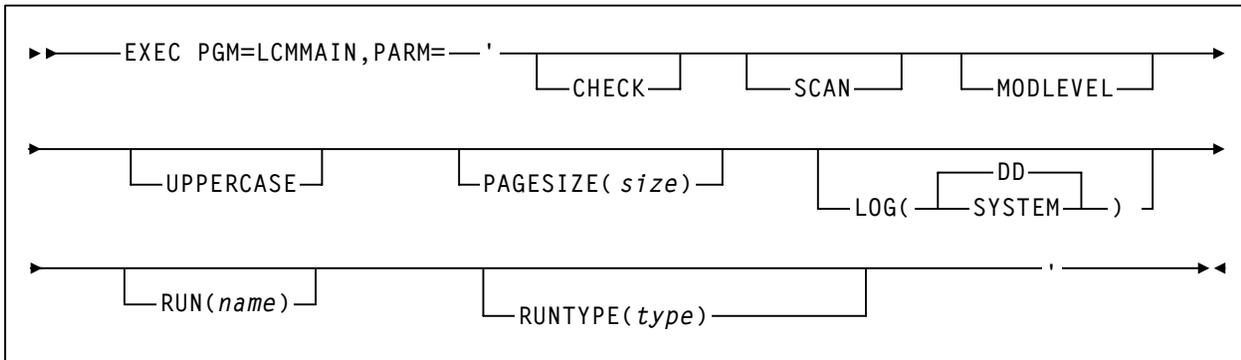
Figure 4. JCL EXEC Statement Syntax

Parameters

`EXEC PGM=LCMMAIN`
> invokes the `LCMMAIN` program to run an ExLM batch job.

`PARM='`*parameter,parameter,...*`'`
> specifies a comma or blank delimited list (enclosed in single quotes) of one or more of the following job execution parameters.

`CHECK`
> identical to the `OPTIONS` statement `CHECK` parameter, specifies that ExLM:
>
> • Manages LSMs as defined by the control statements in the parameter file used for this batch job, but does not eject volumes or modify the HSC CDS (including scratch synchronization).
>
> • Produces reports and creates the Eject File.
> If you specify both the `CHECK` and `SCAN` options, ExLM executes in SCAN mode.

`SCAN`
> identical to the `OPTIONS` statement `SCAN` parameter, specifies that ExLM scans control statement syntax and creates a Parameter File listing with any errors, but does not perform any management action.
>
> If you specify both the `CHECK` and `SCAN` options, ExLM executes in SCAN mode.

`MODLEVEL`
> specifies that ExLM logs a message for each ExLM module loaded for execution. This message describes the module's maintenance level.

UPPERCASE
specifies that ExLM produces reports in all uppercase; the default is mixed case.

PAGESIZE
specifies the number of lines per page for ExLM reports.

size
the number of lines per page. Valid values are 20 to 1000 and the default is 58.

LOG
specifies where ExLM writes log messages.

DD
specifies that ExLM writes log messages to ddname LCMLOG if specified in the job JCL. Otherwise, ExLM writes log messages to ddname LCMMSGS. DD is the default.

SYSTEM
specifies that ExLM writes log messages to the system console.

RUN
specifies that ExLM executes an Explorer RUN object from the Explorer configuration file allocated to ddname LCMCFG. RUN is optional; only specify RUN if you are using an Explorer configuration file.

name
specifies the 1 to 10 character name of the Explorer RUN object.

RUNTYPE
defines a variable for comparisons in the SET METHOD statement.

runtype
specifies the 1 to 10 character name of the variable. The default is STANDARD.

Required and Optional JCL DD Statements

`STEPLIB`

specifies ExLM, HSC, SMC, VSM and sort load libraries; required only if these libraries are not in the MVS linklist. By default, the ExLM, HSC, SMC, and VSM load libraries are installed as data sets LCM.LCMLINK, SLS.SLSLINK, SLS.SMCLINK and SWS.SWSLINK respectively, and the sort package as SYS1.SORTLIB. The sort load library must be APF authorized.

`LCMTMSDB`

specifies the default TMS data base if not specified on the `TMS` statement, and is only required if you do *not* use:

- The `TMS` statement to dynamically allocate to a TMS by data set name.

- ExLM Agent to obtain TMS information.

Because the TMS statement has been updated to support dynamically allocating to a TMS by DSN or obtaining TMS information through the use of the ExLM Agent, which uses dynamic allocation to get to the TMS, the `LCMTMSDB DD` statement is no longer required.

Note: This DD statement is not used if you have specified the NOTMS parameter of the OPTIONS statement.

ExLM defines five input buffers for the `LCMTMSDB` data set by default. ExLM batch job performance might be improved by defining a larger number of input buffers. Code the `DCB BUFNO` subparameter for the `LCMTMSDB DD` statement to specify the desired number of input buffers.

If you create an `LCMTMSDB` statement:

- For CA-1 and CA-TLMS, ddname `LCMTMSDB` should point directly to your TMS catalog or volume master file, respectively.

- For DFSMSrmm, ddname `LCMTMSDB` should point to a DFSMSrmm extract file. The extract file can be produced in another job or in the ExLM run job.

- For other TMSs, the TMS CUSTOM or TMS COMMON interface is required. Contact your TMS vendor to determine how ExLM should be set up with the vendor's TMS.

- Use DCB=BUFNO=255 if your TMS catalog does not contain blocked records.

LCMSECUR

only required to specify the ExLM Agent security file. For example:

```
//LCMSECUR DD DSN=<agent access code file>,DISP=SHR
```

LCMMSGS

specifies the ExLM message file data set. If not specified, ExLM automatically allocates an `LCMMSGS DD` statement using the default SYSOUT class.

SORTMSGS

specifies where messages from your sort software appear.

SYSPRINT

specifies where ExLM writes certain reports. StorageTek recommends that you specify `FREE=CLOSE` to let these reports print while and ExLM job is still running.

If not specified, ExLM automatically allocates a `SYSPRINT DD` statement using the default `SYSOUT` class.

LCMLOG

specifies the ExLM log file data set. If not specified, ExLM writes log output, along with the message file, to ddname `LCMMSGS`.

SYSTERM

specifies where ExLM writes client error messages. If not specified, ExLM automatically allocates an `SYSTERM DD` statement using the default SYSOUT class. SYSTERM is only required if you use an ExLM Agent for remote TMS access.

LCMPARM

specifies the ExLM parameter file data set. `LCMPARM` is required if you do not specify the `RUN` parameter on the `EXEC` statement; see "RUN" on page 29.

You can specify either `LCMCFG` or `LCMPARM` but not both.

LCMCFG

specifies the Explorer configuration file data set. `LCMCFG` is required if you specify the `RUN` parameter on the `EXEC` statement; see "RUN" on page 29. Specify `FREE=CLOSE` to let Explorer update the configuration file when an ExLM job does not have the configuration data set allocated.

You can specify either `LCMCFG` or `LCMPARM` but not both.

LCMEJECT
> specifies the ExLM Eject File data set; only required if the OPTIONS statement specifies the EJFILE option.

> Listed below are the default data set attributes for the Eject File data set.

> - The data set must be a sequential data set (DSORG=PS).
> - The record format must be fixed blocked (RECFM=FB).
> - The logical record length must be 80 bytes (LRECL=80).
> - The block size depends on the type of DASD device used for the data set.

If you wish to code data set attributes for the LCMEJECT DD statement, code the record format as fixed blocked and code the logical record length as 80 bytes.

An example of the LCMEJECT DD statement is:

```
//LCMEJECT DD DSN=EJFILE.DATA.SET,DISP=(,CATLG,DELETE),UNIT=DISK,
//         SPACE=(TRK,(1,1))
```

LCMMTHIN
> specifies the ExLM method file data set; only required if the OPTIONS statement specifies the METHODFILE parameter.

LCMPULL
> specifies the default ExLM pull list file data set if not specified on the PULLLIST statement. This statement is not required if you do not specify a PULLLIST statement.

Various Report DD Statements
> DD statements as specified by the DDNAME parameter of REPORT statements you have coded in your parameter file; for more information, see Chapter 4, "ExLM Management Control Statements" on page 97.

LCMLIB
> specifies the ExLM template library data set; only required if using a customer-defined report template.

Using ExLM to Manage Nearline Resources

> **Hint:** ExLM 6.2 provides new functions that correspond to HSC utilities. For more information, see "What's New in This Guide?" on page xiii.

Member `LCMRUN` in the ExLM SAMPLIB is sample JCL to run an ExLM batch job for Nearline systems; for more information, see Appendix A, "ExLM SAMPLIB Members" on page 357.

ExLM produces printed output whose DCB is LRECL=255,RECFM=VBA. If you direct the output to a disk or tape data set, you should also specify the data set block size.

The Eject Report lists the location name, volume serial number, and slot number for each cartridge ejected. The Enter Report lists volumes (by volser, location name, and slot, if available) that must be entered, including data volumes required for upcoming production runs flagged by `PULLIST` statement parameters. Enter these volumes after eject processing (which creates needed free cells) completes.

ExLM picks scratch volumes for entry and lists their volsers on the Enter Report if:

- You specify the `PICKSCR` parameter on the `OPTIONS` statement,
- Additional scratch volumes are required,
- Non-library scratch volumes are available.

If you do not specify the `PICKSCR` parameter, you must select scratch volumes by another method.

The Scratch Counts Report lists the total number of scratch volumes to be entered for each tape group. If you specify the `PICKSCR` parameter on the `OPTIONS` statement and there are insufficient non-library scratch volumes available, the Operator Report shows this condition. In this case, you may need to make more physical scratch volumes available.

If scratch volumes are entered through a CAP, HSC enters those volumes as nonscratch volumes unless you specify `SCRATCH` on the `ENTER` command. You can also use ExLM to mark newly entered volumes as scratch.

The total number of scratch volumes to be entered is listed on the Scratch Report under the appropriate tape group.

The `ACTION` statement does *ad hoc* actions, including Nearline volume moves and ejects. The `ACTION` statement lets you select volumes (physical or virtual) using any combination of fields and specify actions for the selected volumes.

The `CLEARFROZENPANELS` parameter of the `OPTIONS` statement specifies that ExLM removes volumes from frozen panels in managed LSMs. For more information, see "OPTIONS" on page 126.

HSC usually ejects used cleaning cartridges when they reach maximum use count. If you are running a darkened data center, however, you may want to schedule all ejects for a specific time as follows:

1. Use the following HSC command to mark these cleaning cartridges as not usable without ejecting them:

    ```
    .MNTD EJctauto(OFF)
    ```

2. Write an `ACTION EJECT` statement that uses the clean and notuseable fields to eject these cleaning cartridges when you want. For example:

    ```
    action eject when(clean and notuseable)

            ejmsg('Spent Cleaning Cartridges')

            ejcap(000);
    ```

    For more information, see "ACTION EJECT" on page 201.

    Hint: ExLM provides new functions that correspond to HSC utilities. For more information, see "What's New in This Guide?" on page xiii.

Using EXLM to Manage VSM Resources

> **Hint:** ExLM 6.2 provides new functions that correspond to VTCS utilities. For more information, see "What's New in This Guide?" on page xiii.

ExLM interoperates with VSM as described in the following sections:

- "General Guidelines" contains guidelines for all versions of ExLM and VTCS.
- "Using ExLM to do VTV Consolidations" on page 37
- "Using ExLM to do Migrates and Recalls" on page 38
- "Using ExLM to do Exports" on page 39

General Guidelines

The following are guidelines for using ExLM with all versions of VTCS:

- You can define subpools that contain VTVs by specifying `MEDIA(VIRTUAL)`; for more information, see "SUBPOOL" on page 154.
- To synchronize VTV scratch status, you specify the `OPTIONS SYNCVTV` keyword; for more information, see "OPTIONS" on page 126. If you specify the `SYNCVTV` keyword, note the following:

  - `SYNCVTV` does not update the scratch status of VTVs not defined to the TMS.
  - StorageTek recommends that you define VTV ranges in scratch status; for more information, see the `VTVVOL` statement of the `CONFIG` utility in *VTCS Installation, Configuration, and Administration Guide.* If you do not define VTVs as scratch, you must use `ACTION SCRATCH` to scratch these volumes.
  - You use the `DELSCR` parameter of the `MGMTclas` statement to specify whether VSM deletes scratched VTVs from the VTSS; for more information, see Chapter 2 of *VTCS Installation, Configuration, and Administration Guide.*
  - Specifying `DELSCR YES` causes VTCS to delete scratched VTVs from the VTSS, which frees VTSS buffer space. `DELSCR YES`, however, eliminates the ability to recover data from scratched VTVs.
  - Normally, if the TMS marks a VTV as scratch, `DELSCR` is set to `YES`, and you specify the `OPTIONS SYNCVTV` keyword, the VTV is deleted from the VTSS on scratch and cannot be recovered. However, in ExLM 6.0 and above, there is a default grace period of 1 hour (or a user-set time) when performing scratch synchronization for VTVs. This means that any VTV selected during this period

of time will be excluded from scratch synchronization to reduce exposure to an inadvertent scratch of a VTV created during the scratch synchronization run.

- The ExLM Volume Report provides additional fields to report VSM information; for more information, see "REPORT VOLUME" on page 322.

- The following standard ExLM reports also include VSM information, where ExLM reports the *lsm-id* as `VSM` and the *acs-id* as `VS`:

  - The Scratch Counts Report, where scratch counts for VTVs are denoted by a "+" suffix.

  - The Nonscratch Counts Report.

  - The Summary Report, which includes VTV scratch and nonscratch counts. Free cells, which are not meaningful for VTVs, are always reported as zero.

  The Cell Count and Operator Reports *do not* include VSM information.

- You can use the `SET METHOD` statement to conditionally assign management methods to unexpired or nonscratch MVCs. To ensure that ExLM does not eject MVCs, assign them a management method of `NEVEREJECT`. For example:

  SET METHOD WHEN(MVC) NEVEREJECT;

  For more information, see "SET METHOD" on page 147.

- You can use the `SET METHOD` statement, which provides additional fields for MVCs, to conditionally assign management methods to unexpired or nonscratch MVCs. For more information, see "SET METHOD" on page 147.

Using ExLM to do VTV Consolidations

The following procedure tells how to do VTV consolidations.

Hint: You can also use the `ACTION CONSOLIDATE` statement to do *ad hoc* VTV consolidations. The `ACTION` statement lets you select volumes (physical or virtual) using any combination of fields and specify actions for the selected volumes. For more information, see "ACTION CONSOLIDATE" on page 196.

To do VTV consolidations:

1. **Ensure that the parameter file for the consolidation job contains a** `MANAGE VIRTUAL` **statement.**

   For more information, see "MANAGE VIRTUAL" on page 116.

2. **Create a method that specifies the consolidation group on the** `METHOD CONSOLIDATE` **parameter.**

   For more information, see "METHOD" on page 117.

3. **Use another ExLM statement to assign the consolidation method.**

   For example, you can use the `DATASET` statement to assign a consolidation method to all data sets with a specific high-level qualifier. For more information about assigning methods, see "Usage" on page 138.

4. **Use the ExLM operator commands to monitor and control the consolidation job.**

   For more information, see:

   - "DISPLAY" on page 349
   - "PAUSE" on page 351
   - "RESUME" on page 354
   - "Using MVS Commands" on page 347

5. **Use the Consolidation Report to display the results of the consolidation job.**

   For more information, see "REPORT CONSOLIDATE" on page 252.

Using ExLM to do Migrates and Recalls

The following procedure tells how to do VTV migrates and recalls.

VTVs can be included on pull lists, which is useful if you want to pre-stage VTVs for a specific job or batch processing window. For more information, see "PULLLIST" on page 144.

Hint: You can also use the `ACTION MIGRATE` and `ACTION RECALL` statements to do *ad hoc* VTV migrates and recalls. The `ACTION` statement lets you select volumes (physical or virtual) using any combination of fields and specify actions for the selected volumes. For more information, see "ACTION MIGRATE" on page 216 and "ACTION RECALL" on page 227.

To do VTV migrations and recalls:

1. **Ensure that the parameter file for the migration or recall job contains a** `MANAGE VIRTUAL` **statement.**

   For more information, see "MANAGE VIRTUAL" on page 116.

2. **Create a method that specifies migration or recall parameters.**

   For more information, see "METHOD" on page 117.

3. **Use another ExLM statement to assign the migration or recall method.**

   For example, you can use the `DATASET` statement to assign a migration or recall method to all data sets with a specific high-level qualifier. For more information about assigning methods, see "Usage" on page 124.

4. **Use the ExLM operator commands to monitor and control the migration or recall job.**

   For more information, see:

   - "DISPLAY" on page 349
   - "PAUSE" on page 351
   - "RESUME" on page 354
   - "Using MVS Commands" on page 347

5. **Use the Migration and Recall Reports to display the results of the job.**

   For more information, see "REPORT MIGRATE" on page 270 and "REPORT RECALL" on page 283.

Using ExLM to do Exports

The following procedure tells how to do exports.

You can also use the `ACTION EXPORT` statement to do *ad hoc* exports.The `ACTION` statement lets you select volumes (physical or virtual) using any combination of fields and specify actions for the selected volumes. For more information, see "ACTION EXPORT" on page 208.

To do exports:

1. **Ensure that the parameter file for the export job contains a** `MANAGE VIRTUAL` **statement.**

   For more information, see "MANAGE VIRTUAL" on page 116.

2. **Create a method that specifies export parameters.**

   For more information, see "METHOD" on page 117.

3. **Use another ExLM statement to assign the export method.**

   For example, you can use the `DATASET` statement to assign an export method to all data sets with a specific high-level qualifier. For more information about assigning methods, see "Usage" on page 124.

4. **Use the ExLM operator commands to monitor and control the export job.**

   For more information, see:

   - "DISPLAY" on page 349
   - "PAUSE" on page 351
   - "RESUME" on page 354
   - "Using MVS Commands" on page 347

5. **Use the Export Report to display the results of the job.**

   For more information, see "REPORT EXPORT" on page 266.

Chapter 3. Using ExLM with Your TMS

This chapter tells how to use ExLM with the TMSs described in the following sections:

- "Using ExLM with CA-1" on page 44
- "Using ExLM with DFSMSrmm" on page 54
- "Using ExLM with CA-TLMS" on page 63
- "Using ExLM with a Custom TMS Interface Module" on page 74
- "Using ExLM with Control-T" on page 73
- "Using ExLM with Open Systems Clients" on page 83

See also "General Guidelines for Defining TMSs" on page 42 and "Setting Up the ExLM Interface to Any TMS" on page 43.

General Guidelines for Defining TMSs

Use the following guidelines to define TMSs to ExLM:

- Specify `TMS` statements before you reference them by TMS name in other statements.

- You can specify an unlimited number of `TMS` statements in a parameter file; ExLM checks multiple `TMS` statements for volume information in their order in the parameter file. If a volume is defined in multiple TMSs, ExLM uses information from the first `TMS` statement that applies, unless the `TMSNAME` parameter of the `SUBPOOL` statement specifies otherwise. Therefore, if you specify multiple `TMS` statements, StorageTek recommends that you specify the TMS on the `SUBPOOL TMSNAME` parameter. For more information, see "SUBPOOL" on page 154.

- Multi-volume data sets cannot span TMSs. If ExLM finds volumes with the same controlling data set name in multiple TMSs defined to ExLM, ExLM considers these volumes as belonging to different data sets.

- If you do not specify any `TMS` statements or the `OPTIONS NOTMS` parameter, ExLM uses the defaults from the TMS CA1 statement. If you are running without a TMS, StorageTek recommends that you follow the guidelines in "Running ExLM without a TMS" on page 139.

  If you specify the `OPTIONS NOTMS` parameter to indicate that you are running without a TMS, you cannot specify any `TMS` statements.

Setting Up the ExLM Interface to Any TMS

The following procedure tells how to set up the ExLM interface to any TMS. See the appropriate section in this Chapter to complete specific setup for your TMS.

To set up the ExLM interface to a TMS:

1. **If your system has multiple MVS hosts without shared DASD, ensure that the ExLM Agent started task is running on the MVS system where your TMS catalog resides.**

   For more information, see *ExLM Installation and Maintenance Guide*.

2. **Create a `TMS` statement to define your TMS to ExLM.**

   See "ExLM Management Control Statements" on page 97.

3. **If your `TMS` statement specifies a ddname for the TMS tape catalog, create a DD statement for the TMS tape catalog.**

   For more information, see "Creating an ExLM Batch Job" on page 27.

Using ExLM with CA-1

This section tells how to use ExLM with CA-1 as described in the following sections:

- "Using ExLM to Manage CA-1 Scratch Subpools"
- "Using ExLM with the CA-1 Vault Management System" on page 47
- "Using ExLM to Manage Externally Managed Volumes" on page 51
- "Using ExLM to Manage Expired Volumes" on page 51
- "How ExLM Processes Specific OPTIONS Statement Parameters For CA-1" on page 52

Using ExLM to Manage CA-1 Scratch Subpools

ExLM can manage the LSM scratch volume supply for CA-1 scratch subpools. ExLM can also select for entry scratch volumes that are defined to the CA-1 system. For CA-1, ExLM considers a volume as scratch if the TMC indicates the volume is scratch, not marked deleted, not out-of-area, and not marked defective. The following procedure tells how to define a CA-1 scratch subpool to ExLM. Also see "Managing a Single Scratch Volume Subpool" and "Managing Multiple Scratch Volume Subpools" on page 45.

To define a CA-1 scratch subpool to ExLM:

1. **Create an ExLM OPTIONS statement to define global processing options for CA-1.**

   ExLM can pick scratch volumes for entry as specified by the PICKSCR parameter of the OPTIONS statement. ExLM reads the CA-1 TMC and selects volumes for entry that are usable, not out-of-area, and that have the lowest volume open counts. For more information, see "OPTIONS" on page 126.

2. **Create an ExLM SUBPOOL statement to define a subpool that corresponds to a CA-1 subpool.**

   The CA-1 SCRPOOL control statement defines the subpool to CA1. For more information on the ExLM SUBPOOL control statement, see "SUBPOOL" on page 154.

   Ensure that the volsers specified on the SCRPOOL statement match those specified on the SUBPOOL statement. StorageTek recommends you use the same subpool name in both statements.

3. **Create an ExLM MANAGE statement to define the scratch criteria.**

   ExLM can ensure that a sufficient supply of scratch volumes resides in the ACS as specified by the NUMSCR parameter of the MANAGE statement. ExLM also can eject excess scratch volumes of LSM scratch subpools as specified by the CMAXSCR and AMAXSCR parameters of the MANAGE statement. ExLM reads the CA-1 TMC and selects those volumes for ejection that have the highest volume open counts. For more information, see "MANAGE PHYSICAL" on page 109.

Managing a Single Scratch Volume Subpool

If your configuration does not use multiple CA-1 scratch subpools, ExLM can manage the entire LSM scratch volume supply as a single subpool. You can either define an ExLM subpool or use the predefined GENERAL subpool.

Figure 5 shows an example of a MANAGE statement to manage the entire LSM scratch volume supply as the GENERAL subpool.

```
manage lsmid(00:00)

numscr.general(150)    /* Ensure at least this many     */

cmaxscr.general(175) ; /* Don't remove below this limit */
```

Figure 5. Example of Managing a Single CA-1 Scratch Pool with ExLM

Managing Multiple Scratch Volume Subpools

Figure 6 shows CA-1 SCRPOOL control statements that define scratch subpools, 100000-199999, PAYROLL, and MKTG.GROUP.

```
SCRPOOL=100000-199999,RANGE=100000-199999

SCRPOOL=PAYROLL,RANGE=705000-705999

SCRPOOL=MKTG.GROUP,RANGE=450000-625999
```

Figure 6. Example of Multiple CA-1 Scratch Subpool Definitions

Figure 7 shows ExLM `SUBPOOL` and `MANAGE` statements that define the CA-1 scratch subpools shown in Figure 6.

```
subpool  name('100000-199999')  serials(100000-199999);

subpool  name(payroll)          serials(705000-705999);

subpool  name('mktg.group')     serials(450000-625999);


manage lsmid(00:00)

    numfree(20)

    numscr .'100000-199999'(  75 )

    cmaxscr.'100000-199999'( 100 )

    numscr .payroll        (  60 )

    cmaxscr.payroll        ( 100 ) ;


manage lsmid(00:01)

    numfree(125)

    numscr .'100000-199999'(  75 )

    cmaxscr.'100000-199999'( 100 )

    numscr .'mktg.group'   ( 150 )

    cmaxscr.'mktg.group'   ( 250 ) ;
```

Figure 7. Example of Defining Multiple CA-1 Scratch Subpools for ExLM

Note: You can define multiple scratch subpools to be managed by ExLM even if your site does not use multiple CA-1 scratch subpools. Multiple scratch subpools can be used, for example, to maintain LSM scratch volume supplies for different user groups or applications. These user groups or applications must follow site volser use conventions for this approach to work effectively.

Using ExLM with the CA-1 Vault Management System

The CA-1 Vault Management System (VMS) schedules volumes for storage in vaults. The CA-1 system administrator creates vault definitions and a vaulting schedule for the VMS. ExLM can interface with the VMS to help manage volumes in an LSM that is under VMS control.

To maintain VMS integrity with ExLM, follow VMS guidelines and the guidelines in "Using ExLM to Manage Vault Rotation" on page 50.

Defining VMS Vault Names to ExLM with LOCATION Statements

VMS assigns a vault name to a volume when VMS schedules the volume for vaulting and records this assignment in the TMC as the volume out-of-area code. VMS allows both user-defined and VMS-defined vault names, which are the blank or null vault name, LIB, and any nonblank vault name that begins with a blank character, for example, 'ƀLIB' or 'ƀVMS'. The VMS assigns the blank or null vault name to each volume that should be stored at the main tape library location. See the CA-1 documentation for information on how the VMS assigns other VMS-defined vault names.

ExLM considers VMS vault names (out-of-area codes) as location codes. You can create an ExLM LOCATION statement to define any VMS vault name to ExLM; for more information, see "LOCATION" on page 103. StorageTek recommends that you create LOCATION statements for your vaults before you create any DATASET or SUBPOOL statements to control whether vaulted cartridges are ejected based on location, regardless of whether the cartridges are covered by a DATASET or SUBPOOL statement with the METHOD parameter specified. If you code LOCATION statements for your local location codes, StorageTek recommends that you do not use the METHOD parameter so that the method can be controlled by other statements.

Note: If you need to use a volume that is scheduled for vaulting, you may need to manually check it in through CA-1.

ExLM automatically creates the LOCATION statements shown in Figure 8 for local locations. You can create LOCATION statements to override the statements shown in Figure 8.

```
location loccode('ƀ')    name('Local') slots;

location loccode(libr)   name('Local') slots;

location loccode('ƀLIB') name('Local') slots;

location loccode('ƀVMS') name('Local') slots;
```

Figure 8. Internally Created LOCATION Statements for VMS-defined Vaults

Note: VMS-defined vault names that begin with a blank character, must be enclosed in quotes and in all uppercase letters, which VMS requires for vault names. The order in which ExLM ejects cartridges is determined by the order in which the corresponding location names appear in the ExLM parameter file.

You can also specify all VMS-defined vaults on a single LOCATION statement using the unique location code *CA1LOCAL as shown in Figure 9.

```
location loccode(*CA1LOCAL)name('local') slots;
```

Figure 9. *CA1LOCAL location code to include all VMS-defined Vaults

Figure 10 shows LOCATION statements for user-defined vault names VLT1, ARCH, and a blank for the main library, and the VMS-defined vault name VMS and a METHOD statement to manage locations VLT1 and ARCH.

```
/* VAULT method.  The EJECT parameter can be changed to EJECT(NO)     */

/* if you do not want vaulted tapes to be ejected by this ExLM run.  */


method name(vault) eject(yes);


/* LOCATION statements for VLT1, ARCH, the main library, and  VMS.   */


location code(vlt1)  name(Vault1)  method(vault) slots;

location code(arch)  name(Archive) method(vault) slots;

location code(' ' ' VMS')    name(Local) noslots;
```

Figure 10. Example of Defining CA-1 Vault Names as ExLM Locations

> **Hint:** By using a METHOD statement to define method VAULT, you can control whether volumes in locations VLT1 and ARCH are ejected by simply changing the EJECT parameter value on the METHOD statement. You could also specify a method that uses the ORDER parameter so that volumes in these locations are selected for ejection or demotion first if required.

How ExLM Manages Out-of-Area Codes without Corresponding LOCATION Statements

ExLM treats out-of-area codes without corresponding `LOCATION` statements as follows:

- If the out-of-area code is one of the VMS-defined vault names, ExLM uses these `LOCATION` statement parameter values and keywords:

  1. `NAME(Local)`

  2. `SLOTS`

  3. no method

- If the out-of-area code is a user-defined vault name and a default `LOCATION` statement exists, its parameters are used.

- If the out-of-area code is a user-defined vault name but a default `LOCATION` statement does not exist, ExLM uses these parameters:

  1. location name the same as the out-of-area code

  2. `NOSLOTS`

  3. no method.

Using ExLM to Manage Vault Rotation

Vault rotation occurs when volumes are physically moved between the main tape library and vaults. The VMS vaulting schedule usually drives vault rotation. If you use ExLM to manage vault rotation per the VMS vaulting schedule, use the following guidelines.

- Define all required vaults with LOCATION statements or use the automatically created LOCATION statements. Ensure these LOCATION statements specify methods that indicate ExLM should always eject the associated nonscratch volumes for ExLM jobs that support the vaulting schedule.

- Generally, run a VMS vaulting job first, then run an ExLM job that ejects all volumes associated with offsite locations.

The parameter file shown in Figure 11 causes ExLM to eject all volumes in LSM 000 or LSM 001, which are associated with one of the user-defined vaults VLT1, VLT2, or ARCH. This parameter file also disables HSC scratch status synchronization, but does not specify any other LSM content management requirements for ExLM.

```
options nosync title('Daily Vault Rotation Run');


tms ca1;


/* VAULT method.  The EJECT parameter can be changed to EJECT(NO)    */

/* for ExLM runs where you do not want vaulted tapes to be ejected. */


method name(vault) eject(yes);


/* LOCATION statements                                              */


location code(vlt1 vlt2) method(vault) name('Vault');

location code(arch) method(vault) name('Catacomb');

location code(*CA1LOCAL) name(Local) noslots;


manage lsmid(00:00 00:01);
```

Figure 11. Example of Defining Locations to Perform Vault Rotation

Using ExLM to Manage Data Sets

You can use the `DATASET` control statement to have ExLM manage LSM content by data set name. For CA-1, ExLM uses the data set name contained in the TMC volume record as the controlling data set name for the volume.

Using ExLM to Manage Externally Managed Volumes

ExLM does not automatically assign a management method to externally managed volumes. You can, however, use the `EXTERNAL` parameter on the `OPTIONS` statement to specify the method ExLM uses to manage these volumes. For example, Figure 12 shows an `OPTIONS` statement that specifies that ExLM unconditionally uses the `NEVEREJECT` method to manage externally managed volumes.

```
options external (nevereject uncond);
```

Figure 12. Example of Specifying NEVEREJECT for Externally Managed Volumes

If you do not specify the `UNCOND` subparameter, the method specified is a default that will be used if no other statement covers the volume and specifies a method. For example, if you want to control some externally managed volumes using the `DATASET` statement, do not specify the `UNCOND` subparameter.

Hint: You can use `EXTERNAL` to assign a method to volumes controlled by DFHSM, but a `DATASET` statement specifying the prefix for migration and backup data sets gives you more control.

Using ExLM to Manage Expired Volumes

Volumes containing expired data sets are expired volumes. ExLM marks a volume as expired if you specify the `TMS CA1 EXPIRECHECK` parameter, the volume is non-scratch, and the TMC shows the volume as expired from Catalog Control, from Cycle Control, by Days Since Last Used Control, or by TMS, CA-1, or EDM. These expired flags are located in field TMFLAG2 of the Volume record.

Using ExLM to Unconditionally Eject Volumes Deleted from the CA-1 TMC

The CA-1 TMC can mark volumes "in delete status". You can use the `TMS CA1 DELETECHECK` parameter to specify that ExLM discards information for volumes marked "in delete status" in the TMS, or you can unconditionally ejects these volumes as shown in the following example:

```
tms ca1 tmcdsn(CA1TMC) NoDeleteCheck;

set method
    when (deleted) eject; // Eject all volumes marked deleted in the tms.
```

How ExLM Processes Specific OPTIONS Statement Parameters For CA-1

The following sections describe how ExLM processes specific OPTIONS statement parameters for CA-1.

CYCLESOON

The CYCLESOON parameter specifies that ExLM does not select volumes to eject that will expire soon. Table 8 describes how ExLM determines volume expiration dates, where:

> ***nnn***
> any decimal number must be substituted.

> Missing
> ExLM does not apply CYCLESOON processing to the volume.

Table 8. ExLM Cycle Date for CA-1 TMC Value

CA-1 Expiration Keyword/Date	ExLM Cycle Date
CATLG	Missing
CATLG/*nnn*	Missing
CYCLE/*nnn*	Missing
FOREIGN	Missing
LDATE/*nnn*	Volume last reference date + nnn
MSG/*nnn*	Missing
PERM	Missing
STATS/*nnn*	Missing
USER/*nnn*	Missing
Julian date	Julian date (unchanged)

EJBAD

The EJBAD option specifies that ExLM ejects all scratch volumes marked as defective. ExLM reads flag TMBADTAP in field TMFLAG3 of the TMC to determine if a volume has been marked as defective. You can also use the CLEANCHECK parameter to specify that ExLM uses flag TMCLEAN in field TMFLAG1 to determine a volume's defective status.

PICKSCR

The `PICKSCR` option specifies that ExLM selects which scratch volumes to enter when additional scratch volumes are required. These volumes are listed on the LSM Enter Report. If `PICKSCR` is not specified, ExLM still determines the number of additional scratch volumes required. The operator can choose which scratch volumes to enter.

If `PICKSCR` is specified but `IGNORE18TRKFLAG` is not, ExLM selects only non-LSM scratch volumes that are indicated in the TMS as being cartridges for entry into an LSM. ExLM uses flag `TM18TRK` in field `TMTRTCH` of the TMC to determine if a volume is a cartridge.

Using ExLM with DFSMSrmm

This section tells how to use ExLM with DFSMSrmm as described in the following sections:

- "Using the DFSMSrmm API to Obtain Volume Information"
- "Using ExLM to Manage DFSMSrmm Scratch Subpools" on page 55
- "Using ExLM with the DFSMSRMM Vital Record Specifications" on page 58
- "Using ExLM to Manage Expired Volumes" on page 62
- "How ExLM Processes Specific OPTIONS Statement Parameters For DFSMSrmm" on page 62

Note: The `EXTERNAL` parameter on the `OPTIONS` statement does not have any meaning to ExLM when using DFSMSrmm because it has no externally managed flag.

Using the DFSMSrmm API to Obtain Volume Information

The `API` parameter of the `TMS RMM` statement specifies that ExLM obtains information from the RMM API, not from the DFSMSrmm report extract data. For more information, see "TMS RMM" on page 181.

The advantages of using the API include:

- Eliminating problems in using the extract file interface, such as old extract files with obsolete data, synchronization problems caused by the lag-time between generating the extract and the time the information is used by ExLM, x37 abends, and so forth.
- The ability to generate real-time information for ExLM Agent. In effect, the RMM flat-file interface is not workable for remote TMS access.

> **Caution:** The **disadvantage** of using the DFSMSrmm API is that you may experience a significant increase in execution time with the API compared to the extract file interface. The API, therefore, is not the default interface except with ExLM Agent.

Using ExLM to Manage DFSMSrmm Scratch Subpools

ExLM can manage the LSM scratch volume supply for DFSMSrmm scratch subpools. ExLM can also select for entry scratch volumes that are defined to the DFSMSrmm system. For DFSMSrmm, ExLM considers a volume as scratch if the RMM CDS shows the volume is scratch (report extract data set volume record field 'rvstatus' = 'SCRATCH' or API Structured Field Introducer 'VST' = '40'), and is not bad (based on the PERMERRORS and TEMPERRORS parameters).

The reference date that ExLM uses for a volume in the DFSMSrmm report extract data set is the most recent of the following dates:

- Create Date
- Last Change Date
- Last Read Date
- Last Written Date

The following procedure tells how to define a DFSMSrmm scratch subpool to ExLM. Also see "Managing a Single Scratch Volume Subpool" on page 56 and "Managing Multiple Scratch Volume Subpools" on page 56.

To define a DFSMSrmm scratch subpool to ExLM:

1. **Create an ExLM OPTIONS statement to define global processing options for DFSMSrmm.**

   ExLM can pick scratch volumes for entry as specified by the PICKSCR parameters of the OPTIONS statement. ExLM reads DFSMSrmm information and selects scratch volumes that are not in-transit, are in the ACS (are not in a storage location), and have the lowest use counts; see "OPTIONS" on page 126.

2. **Create an ExLM SUBPOOL statement to define a subpool that corresponds to a DFSMSrmm subpool.**

   The DFSMSrmm VLPOOL control statement defines the subpool to DFSMSrmm. For more information on the ExLM SUBPOOL control statement, see "SUBPOOL" on page 154.

   Ensure that the volsers specified on the VLPOOL statement match those specified on the SUBPOOL statement. StorageTek recommends you use the same subpool name in both statements.

3. **Create an ExLM MANAGE statement to define the scratch criteria.**

   ExLM can ensure that a sufficient supply of scratch volumes resides in the ACS as specified by the NUMSCR parameter of the MANAGE statement. ExLM also can eject excess scratch volumes of LSM scratch subpools as specified by the CMAXSCR and AMAXSCR parameters of the MANAGE statement. ExLM reads DFSMSrmm information and selects volumes with the highest volume use counts for ejection. For more information, see "MANAGE PHYSICAL" on page 109.

Managing a Single Scratch Volume Subpool

STOP **Warning:** If your configuration does not use multiple DFSMSrmm scratch subpools, ExLM can manage the entire LSM scratch volume supply as a single subpool. You can either define an ExLM subpool or use the predefined `GENERAL` subpool.

Figure 13 shows an example of a `MANAGE` statement to manage the entire LSM scratch volume supply as the `GENERAL` subpool.

```
manage lsmid(00:00)

/* Ensure at least this many */

numscr.general(150)

/* Don't remove below this limit */

cmaxscr.general(175) ;
```

Figure 13. Example of Managing a DFSMSrmm Scratch Pool

Managing Multiple Scratch Volume Subpools

Figure 14 shows DFSMSrmm `VLPOOL` control statements that define scratch subpools `BACKUP TAPES`, `ADMINISTRATION`, and `PAYROLL`.

```
VLPOOL PREFIX BK* TYPE(S) -

DESCRIPTION('BACKUP TAPES')

VLPOOL PREFIX ADM* TYPE(S) -

DESCRIPTION('ADMINISTRATION')

VLPOOL PREFIX PAYR* TYPE(S) -

DESCRIPTION('PAYROLL')
```

Figure 14. Example of Multiple DFSMSrmm Scratch Pools

Note: If you have a volser that begins with the `VLPOOL` prefix but the suffix is not numeric, ExLM will not manage it by subpool. For example, if the DFSMSrmm subpool prefix is BK* and the ExLM subpool serial number range is BK0000-BK9999, then volume `BKABCD` would not be managed by ExLM subpool.

Figure 15 shows ExLM SUBPOOL and MANAGE statements that define the DFSMSrmm scratch subpools shown in Figure 14.

```
subpool  name('Backup Tapes')
 serials(BK0000-BK9999);
subpool  name('Administration')
 serials(ADM000-ADM999);
subpool  name(Payroll)
 serials(PAYR00-PAYR99);
manage  lsmid(00:00)
numfree(20)
numscr .'Backup Tapes' ( 75 )
cmaxscr.'Backup Tapes' ( 100 )
numscr .Payroll ( 10 )
cmaxscr.Payroll ( 50 ) ;
manage lsmid(00:01)
numfree(125)
numscr .'Backup Tapes' ( 75 )
cmaxscr.'Backup Tapes' ( 100 )
numscr .'Administration' ( 10 )
cmaxscr.'Administration' ( 25 ) ;
```

Figure 15. Example of Defining Multiple DFSMSrmm Scratch Subpools for ExLM

Note: You can define multiple scratch subpools to be managed by ExLM even if your site does not use multiple DFSMSrmm scratch subpools. Multiple scratch subpools can be used, for example, to maintain LSM scratch volume supplies for different user groups or applications. These user groups or applications must follow site volser use conventions for this approach to work effectively.

Using ExLM with the DFSMSRMM Vital Record Specifications

The DFSMSrmm Vital Record Specifications (VRS) set policies for retaining or moving volumes among storage locations or within the ACS. The VRS contains destination names and volume movement schedules. If the VRS in-transit flag is on, the volume is scheduled for movement and the destination is recorded in the report extract data set. If the in-transit flag is off, the volume is not to be moved and the location code that ExLM records for the volume is the current store location name unless there is a value in the `RVLONLOC` field indicating the volume is currently on loan outside ACS or designated storage locations.

To maintain VRS integrity with ExLM, follow VRS guidelines and the guidelines in "Defining VRS Store Location Names to ExLM with LOCATION Statements" and "Using ExLM to Manage Volume Movement" on page 60.

Defining VRS Store Location Names to ExLM with LOCATION Statements

ExLM considers DFSMSrmm store location names or destination names as location codes. You can create an ExLM `LOCATION` statement to define any VRS Store Location Name to ExLM; for more information, see "LOCATION" on page 103. StorageTek recommends that you create `LOCATION` statements for your storage locations before you create any `DATASET` or `SUBPOOL` statements to control whether volumes in these locations are ejected based on location, regardless of whether the cartridges are covered by a `DATASET` or `SUBPOOL` statement with the `METHOD` parameter specified. If you code `LOCATION` statements for your local location codes, StorageTek recommends that you do not use the `METHOD` parameter so that the method can be controlled by other statements.

DFSMSrmm assigns the following destinations/locations:

LOCAL
Onsite or offsite storage location

DISTANT
Onsite or offsite storage location

REMOTE
Onsite or offsite storage location

SHELF
Shelf locations in a non-system-managed library

sms_defined_library_name
Shelf locations in a system-managed library

Note: Volumes scheduled for storage at a user-defined storage location are considered in-transit and you may need to confirm volume moves by building the appropriate DFSMSrmm `CHANGEVOLUME` subcommands.

Figure 16 shows `LOCATION` statements for `SHELF`, `LOCAL`, `DISTANT`, and `REMOTE`. By using a `METHOD` statement to define a method of `STORAGE`, you can control whether volumes are

ejected by simply changing the `METHOD` statement. In this example, volumes with storage locations are always ejected.

```
/* STORAGE method. The EJECT parameter can    */

/* be changed to EJECT(NO) if you do not want  */

/* storage tapes to be ejected by this         */

/* ExLM run.                                    */


method name(storage) eject(yes);


/* LOCATION statements for SHELF, LOCAL,        */

/* DISTANT and REMOTE */


location code(Shelf);

location code(Local) method(storage) slots;

location code(Distant) method(storage) slots;

location code(Remote) method(storage) slots;
```

Figure 16. Example of DFSMSrmm Storage Locations

Note that the location code for the volume comes from one of three possible sources:

1. If the in-transit flag is on, the destination is used.

2. If the loan location field is not blank, the loan location is used.

3. If the in-transit flag is off and the loan location is blank, the store location is used.

Also note the value that prints for slots is the bin number for all volumes in a storage location, and the rack number for all volumes in the ACS.

The order in which ExLM ejects volumes is determined by the order in which the corresponding location names appear in the ExLM parameter file.

How ExLM Manages Location Codes without Corresponding LOCATION Statements

ExLM treats location codes without corresponding `LOCATION` statements as follows:

- If the location code is a user-defined library name and a default `LOCATION` statement exists, its parameters are used.

- If the location code is a user-defined library name but no default `LOCATION` statement exists, ExLM uses these parameters:

  1. location name the same as the location code,

  2. `NOSLOTS`, and

  3. no method.

Using ExLM to Manage Volume Movement

Volume movement occurs when volumes are physically transported between the main tape library and tape volume storage locations. The VRS volume movement schedule typically drives volume movement. If you use ExLM to manage volume movement, use the following guidelines.

- Define all required storage destinations/location with `LOCATION` statements or use the automatically created `LOCATION` statements. Ensure these `LOCATION` statements specify methods that indicate ExLM should always eject the associated nonscratch volumes for ExLM jobs that support the volume movement schedule.

- Generally, first run a DFSMSrmm job that schedules volumes for storage at a specific location, then run an ExLM job that ejects all volumes associated with that storage location.

The parameter file shown in Figure 17 causes ExLM to eject all volumes in LSM 000 or LSM 001 that are associated with one of the DFSMSrmm storage locations LOCAL, REMOTE, or DISTANT. This example parameter file also disables HSC scratch status synchronization, but does not specify any other LSM content management requirements for ExLM.

```
options nosync

        title('Daily Volume Movement Run');


tms rmm;


/* STORAGE method. The EJECT parameter can   */

/* be changed to EJECT(NO) for ExLM runs     */

/* where you do not want vaulted tapes to    */

/* be ejected.                               */


method name(storage) eject(yes);


/* LOCATION statements                       */


location code(Local) method(storage);

location code(Remote) method(storage);

location code(Distant) method(storage);

location code(Shelf) noslots;

manage lsmid(00:00 00:01);
```

Figure 17. Example of Volume Movement Run

Hint: By using a METHOD statement to define method STORAGE, you can control whether volumes in locations Local, Remote, and Distant are ejected by simply changing the EJECT parameter value on the METHOD statement. You could also specify a method that uses the ORDER parameter so that volumes in these locations are selected for ejection or demotion first if required.

Using ExLM to Manage Data Sets

You can use the `DATASET` control statement to have ExLM manage LSM content by data set name. For DFSMSrmm, ExLM uses the data set name contained in the TMS volume record as the controlling data set name for the volume.

Using ExLM to Manage Expired Volumes

Volumes containing expired data sets are expired volumes. ExLM marks a volume as expired if you specify the `TMS RMM EXPIRECHECK` parameter, the volume is non-scratch, and the DFSMSrmm report extract data set shows it to be pending release.

How ExLM Processes Specific OPTIONS Statement Parameters For DFSMSrmm

The following sections describe how ExLM processes specific `OPTIONS` statement parameters for DFSMSrmm.

CYCLESOON

The `CYCLESOON` parameter specifies that ExLM does not select volumes to eject that will expire soon. To apply `CYCLESOON` processing, ExLM uses the volume expiration date in the `RVEXPDT` field when the `RVPENDRS`, Volume Pending Release, flag is on in DFSMSrmm.

EJBAD

The `EJBAD` option specifies that ExLM ejects all scratch volumes marked as defective. The `TMS RMM` statement has two parameters,: `TEMPERRORS` and `PERMERRORS` to tell ExLM when a scratch volume is considered defective. If the number of temporary read or temporary write errors is greater than or equal to the number of errors specified for `TEMPERRORS`, the volume is considered defective. Similarly, if the number of permanent read or permanent write errors is greater than or equal to the number of errors specified by `PERMERRORS`, the volume is considered defective. ExLM uses the `RVTRERR`, `RVTWERR`, `RVPRERR`, and `RVPWERR` fields in DFSMSrmm to determine the number of errors for a volume.

PICKSCR

The `PICKSCR` option specifies that ExLM selects which scratch volumes to enter when additional scratch volumes are required. These volumes are listed on the LSM Enter Report. If `PICKSCR` is not specified, ExLM still determines the number of additional scratch volumes required. The operator can choose which scratch volumes to enter.

If `PICKSCR` is specified but `IGNORE18TRKFLAG` is not, ExLM selects only non-LSM scratch volumes that are indicated in the TMS as being cartridges for entry into an LSM. ExLM uses flag `RVMEDREC` in DFSMSrmm to determine if a volume is a cartridge.

Using ExLM with CA-TLMS

This section tells how to use ExLM with CA-TLMS as described in the following sections:

- "Using ExLM to Manage CA-TLMS Scratch Subpools" on page 64

- "Using ExLM with the CA-TLMS Tape Retention System" on page 67

- "Using ExLM to Manage Externally Managed Volumes" on page 70

- "How ExLM Processes Specific OPTIONS Statement Parameters For CA-TLMS" on page 71

Using ExLM to Manage CA-TLMS Scratch Subpools

ExLM can manage the LSM scratch volume supply for CA-TLMS scratch subpools. ExLM can also select for entry scratch volumes that are defined to the CA-TLMS system. For CA-TLMS, ExLM considers a volume as scratch if the VMF shows the volume is scratch, in service, and the volume's damaged field has not been assigned one of the values identified by the `TMS TLMS` statement `DAMAGE` parameter.

The following procedure tells how to define a CA-TLMS scratch subpool to ExLM. Also see "Managing a Single Scratch Volume Subpool" on page 65 and "Managing Multiple Scratch Volume Subpools" on page 65.

To define a CA-TLMS scratch subpool to ExLM:

1. **Create an ExLM** `OPTIONS` **statement to define global processing options for CA-TLMS.**

    ExLM can pick scratch volumes for entry as specified by the `PICKSCR` parameter of the `OPTIONS` statement. ExLM reads the CA-TLMS VMF and selects volumes for entry that have the lowest volume use counts since purchased. ExLM only selects those volumes whose DENSITY flag in the VMF indicates that the volume is a cartridge. Note that if a new cartridge has been defined to CA-TLMS but has not yet been OPENed, ExLM will not list it on the LSM ENTER Report. For more information, see "OPTIONS" on page 126.

2. **Create an ExLM** `SUBPOOL` **statement to define a subpool that corresponds to a CA-TLMS subpool.**

    The `POOLID` option defines the subpool to CA-TLMS. For more information on the ExLM `SUBPOOL` control statement, see "SUBPOOL" on page 154.

    Ensure that the volsers specified on the `POOLID` statement match those specified on the `SUBPOOL` statement. StorageTek recommends you use the same subpool name in both statements.

3. **Create an ExLM** `MANAGE` **statement to define the scratch criteria.**

    ExLM can ensure that a sufficient supply of scratch volumes resides in the ACS as specified by the `NUMSCR` parameter of the `MANAGE` statement. ExLM can also eject excess scratch volumes of LSM scratch subpools as specified by the `CMAXSCR` and `AMAXSCR` parameters of the `MANAGE` statement. ExLM reads the CA-TLMS VMF and selects those volumes for ejection that have the highest volume use counts since purchased. For more information, see "MANAGE PHYSICAL" on page 109.

Managing a Single Scratch Volume Subpool

If your configuration does not use multiple CA-TLMS scratch subpools, ExLM can manage the entire LSM scratch volume supply as a single subpool. You can either define an ExLM subpool or use the predefined `GENERAL` subpool.

Figure 18 shows an example of a `MANAGE` statement to manage the entire LSM scratch volume supply as the `GENERAL` subpool.

```
manage lsmid(00:00)

numscr.general(150)    /* Ensure at least this many     */

cmaxscr.general(175) ; /* Don't remove below this limit */
```

Figure 18. Example of Managing a Single CA-TLMS Scratch Pool with ExLM

Managing Multiple Scratch Volume Subpools

Figure 19 shows examples of CA-TLMS `POOLID` option statements that define the `OPER`, `PAY`, and `MKTG` scratch subpools.

```
POOLID=OPER,DSN=OPER,LO1=100000,HI1=199999

POOLID=PAY,DSN=PAYROLL,LO1=705000,HI=705999

POOLID=MKTG,DSN=MKTG,LO1=450000,HI1=625999
```

Figure 19. Example of Multiple CA-TLMS POOLID Definitions

Figure 20 shows ExLM `SUBPOOL` and `MANAGE` statements that define the CA-TLMS scratch subpools shown in Figure 19.

```
subpool   name(oper)   serials(100000-199999);

subpool   name(pay)   serials(705000-705999);

subpool   name(mktg)   serials(450000-625999);


manage  lsmid(00:00)

numfree(20)

numscr .oper  ( 75 )

cmaxscr.oper  ( 100 )

numscr .pay   ( 60 )

cmaxscr.pay   ( 100 ) ;


manage lsmid(00:01)

numfree(125)

numscr .oper  ( 75 )

cmaxscr.oper  ( 100 )

numscr .mktg  ( 150 )

cmaxscr.mktg  ( 250 ) ;
```

Figure 20. Example of Defining Multiple CA-TLMS Scratch Subpools for ExLM

Note: You can define multiple scratch subpools to be managed by ExLM even if your site does not use multiple CA-TLMS scratch subpools. Multiple scratch subpools can be used, for example, to maintain LSM scratch volume supplies for different user groups or applications. These user groups or applications must follow site volser use conventions for this approach to work effectively.

Using ExLM with the CA-TLMS Tape Retention System

The CA-TLMS Tape Retention System (TRS) schedules volumes for movement to predefined locations. The CA-TLMS system administrator defines location definitions and a volume movement schedule for the TRS.   ExLM can interface with the TRS to help manage volumes in an LSM that is under TRS control.

To maintain TRS integrity with ExLM, follow TRS guidelines.

Defining TRS Location IDs to ExLM with LOCATION Statements

When the TRS schedules a volume for storage at a specific location, it assigns the location ID (defined by the TRS `SCA` control statement) to the volume. The CA-TLMS system administrator codes this statement as a record of the Retention Master File (RMF).

ExLM considers TRS location IDs as ExLM location codes. You can create an ExLM `LOCATION` statement to define any TRS location ID to ExLM; for more information, see "LOCATION" on page 103. StorageTek recommends that you create `LOCATION` statements for your location IDs before you create any `DATASET` or `SUBPOOL` statements to control whether volumes scheduled for movement are ejected based on location, regardless of whether the volumes are covered by a `DATASET` or `SUBPOOL` statement with the `METHOD` parameter specified. If you code `LOCATION` statements for your local location IDs, StorageTek recommends that you do not use the `METHOD` parameter so that the method can be controlled by other statements.

Figure 21 shows TRS `SCA` control statements that define location IDs `DC` (onsite at data center), `L1` (offsite library), and `A1` (offsite archive). TRS assigns the default location of `DATACTR` to each volume stored at the main tape library location.

```
SCADCU ... Data center: slots undefined.

SCAL1C ... Library, slots defined: cabinet definitions follow.

C199C299C399C499 ... Cabinets with 100 slots each.

SCAA1B ... Archive, with boxes: box definitions follow.

BOX149BOX249 ... Boxes that hold 50 volumes each.
```

Figure 21. Example of CA-TLMS TRS Location Definitions

Figure 22 shows an example of LOCATION statements to define the TRS location IDS shown in Figure 21.

```
/* OFFSITE method. The EJECT parameter can be changed to EJECT(NO)    */
/* if you do not want offsite tapes to be ejected by this ExLM run.   */


method name(offsite) eject(yes);


/* LOCATION statements for L1, L2, A1 and the main library. */


location code(L1 L2) name(Library) method(offsite) slots;

location code(a1) name(Archive) method(offsite) slots;

location code(dc) noslots;
```

Figure 22. Example of Defining CA-TLMS Locations as ExLM Locations

Note that the default TRS location, CODE(DC), represents the main library location.

How ExLM Manages Location IDs without Corresponding LOCATION Statements

ExLM treats location IDs without corresponding LOCATION statements as follows:

- If a default LOCATION statement exists, its parameters are used.

- If no default LOCATION statement exists, ExLM uses these parameters:

  1. location name the same as the location ID
  2. NOSLOTS
  3. no method.

Using ExLM to Manage Volume Movement

Volume movement occurs when volumes are physically moved between the main tape library and storage locations. The RMF schedule (a set of TRS TDA commands) usually drives volume movement. If you use ExLM to manage vault rotation per the RMF schedule, use the following guidelines.

- Define all required vaults with LOCATION statements. Ensure these LOCATION statements specify methods that indicate ExLM should always eject the associated nonscratch volumes for ExLM jobs that support the vaulting schedule.

- Generally, run an RMF job first, then run an ExLM job that ejects all volumes associated with offsite locations.

The parameter file shown in Figure 23 causes ExLM to eject all volumes in LSM 00:00 or LSM 00:01 that are associated with one of the CA-TLMS locations L1, L2, or A1. This parameter file also disables HSC scratch status synchronization, but does not specify any other LSM content management requirements for ExLM.

```
options nosync title('Daily Volume Movement Run');


tms tlms;


/* OFFSITE method. The EJECT parameter can be changed to EJECT(NO)

/* for ExLM runs where you do not want offsite tapes to be ejected.


method name(offsite) eject(yes);


/* LOCATION statements


location code(l1 l2) name(Library) method(offsite);

location code(a1) name(Catacomb) method(offsite);

location code(dc) name(Local);

manage lsmgrp(Main) lsmid(00:00 00:01);
```

Figure 23. Example of Defining Locations to Perform Volume Movement

Hint: By using a METHOD statement to define method offsite, you can control whether volumes in locations L1, L2, and A1 are ejected by simply changing the EJECT parameter value on the METHOD statement. You could also specify a method that uses the ORDER parameter so that volumes in these locations are selected for ejection or demotion first if required.

Using ExLM to Manage Data Sets

You can use the `DATASET` control statement to have ExLM manage LSM content by data set name. For CA-TLMS, ExLM uses the data set name contained in the TMS volume record as the controlling data set name for the volume.

Using ExLM to Manage Externally Managed Volumes

ExLM does not automatically assign a management method to externally managed volumes. You can, however, use the `EXTERNAL` parameter on the `OPTIONS` statement to specify the method ExLM uses to manage these volumes. For example, Figure 24 shows an `OPTIONS` statement that specifies that ExLM unconditionally uses the `NEVEREJECT` method to manage externally managed volumes.

```
options external (nevereject uncond);
```

Figure 24. Example of Specifying NEVEREJECT for Externally Managed Volumes

If you do not specify the `UNCOND` subparameter, the method specified is a default that will be used if no other statement covers the volume and specifies a method. For example, if you want to control some externally managed volumes using the `DATASET` statement, do not specify the `UNCOND` subparameter.

Hint: You can use `EXTERNAL` to assign a method to volumes controlled by DFHSM, but a `DATASET` statement specifying the prefix for migration and backup data sets gives you more control.

How ExLM Processes Specific OPTIONS Statement Parameters For CA-TLMS

The following sections describe how ExLM processes specific `OPTIONS` statement parameters for CA-TLMS.

CYCLESOON

The `CYCLESOON` parameter specifies that ExLM does not select volumes to eject that will expire soon. Table 9 describes how ExLM determines volume expiration dates, where:

> ***nnn***
>> any decimal number must be substituted.

> `Missing`
>> ExLM does not apply `CYCLESOON` processing to the volume.

If the volume or data set keep date is greater than the expiration date, ExLM uses the keep date for `CYCLESOON` processing.

Table 9. ExLM Cycle Date for TLMS VMF Value

TLMS Expiration Keyword/Date	ExLM Cycle Date
AGE/nnn	Volume creation date + nnn
CATLG	Missing
CATLG/nnn	Missing
CYCLE/nnn	Missing
FOREIGN	Missing
LDATE/nnn	Volume last reference date + nnn
MSG/nnn	Missing
PERM	Missing
STATS/nnn	Missing
USER/nnn	Missing
ZEROS	Missing
Julian date	Julian date (unchanged)

EJBAD

The `EJBAD` option specifies that ExLM ejects all scratch volumes marked as defective. ExLM considers a volume to be defective according to the value specified for the Machine Damage Indicator, `BADAMAGE` in the VMF, and the `DAMAGE` parameter of the `TMS` statement.

PICKSCR

The `PICKSCR` option specifies that ExLM selects which scratch volumes to enter when additional scratch volumes are required. These volumes are listed on the LSM Enter Report. If `PICKSCR` is not specified, ExLM still determines the number of additional scratch volumes required. The operator can choose which scratch volumes to enter.

If `PICKSCR` is specified but `IGNORE18TRKFLAG` is not, ExLM selects only non-LSM scratch volumes that are indicated in the TMS as being cartridges for entry into an LSM. ExLM uses flag `BADEN` in the VMF to determine if a volume is a cartridge.

EXPIRECHECK

CA-TLMS does not mark volumes as expired, so the `EXPIRECHECK` option has no effect on ExLM processing for CA-TLMS volumes.

Using ExLM with Control-T

The Control-T (Control-M®/Tape) TMS was previously supported through the TMS Custom interface using the `CTTXLM` module provided by Control-T.

ExLM now supports Control-T as described in "Required Software Maintenance Levels for Control-T Support" and "TMS CTT" on page 170. Also note that ExLM has added "raw" fields from the Control-T media database for use as selection and output criteria (see the *Quick Reference* manual for more information on these fields).

Although specified differently via the TMS CTT statement, operation generally follows the techniques described in "Using ExLM with a Custom TMS Interface Module" on page 74.

Required Software Maintenance Levels for Control-T Support

- ExLM: Version 6.0.0 with PTF L1L00DO (support is integrated into ExLM 6.2 and above)

- Control-T: Version 6.2.00 with APAR WT0849 or above

JCL Changes for ExLM Jobs

1. Add the Control-T IOA library to the STEPLIB of the ExLM job.

2. Add the following DD statement to the ExLM job:

   ```
   //DAPARM  DD DISP=SHR,DSN=&ILPREFA.PARM

   //        DD DISP=SHR,DSN=&ILPREFA.IOAENV
   ```

   Note: *&ILPREFA* should be replaced according to the IOA installation.

3. Define the Control-T Media database media file, first extent only (MDBD), using either the DDNAME or DSN parameter on the TMS CTT statement. Example of a DD statement used with the DDNAME parameter follows:

   ```
   //LCMTMSDB DD DISP=SHR,DSN=&DBPREFT.MDBD.E000
   ```

   Note: *&DBPREFT* should be replaced according to the IOA installation.

Using ExLM with a Custom TMS Interface Module

If you have a TMS that is not one of the supported types (such as `CA1`) on the `TMS` statement, you or your TMS vendor can use the ExLM TMS CUSTOM interface to create an interface module to extract information from your TMS as described in the following sections:

- "Creating and Implementing a TMS CUSTOM Interface Module" on page 75

- "Testing a TMS CUSTOM Interface Module" on page 81

You specify the module name on the `MODNAME` parameter of the `TMS CUSTOM` statement; for more information, see " TMS CUSTOM" on page 173.

For more information about existing vendor-provided support for the ExLM TMS CUSTOM interface, see "TMSs Supported through the Custom Interface" on page 82.

Creating and Implementing a TMS CUSTOM Interface Module

A TMS CUSTOM interface module extracts volume information from your TMS and passes that information to ExLM via the `LCMSTMCI` subroutine. SAMPLIB member `LCMUX01S` is a sample TMS CUSTOM interface module.

You specify the module name on the `MODNAME` parameter of the `TMS CUSTOM` statement; for more information, see " TMS CUSTOM" on page 173. The library containing the TMS CUSTOM interface module must be included in the ExLM batch job JOBLIB or STEPLIB library concatenation or in a linklist or LPA library. ExLM issues message `LCM0102E` and terminates with condition code 8 if ExLM cannot find the interface module.

Creating an LCMSTMCI Subroutine

A TMS CUSTOM interface module extracts volume information by making a subroutine call to `LCMSTMCI` for each volume. A TMS CUSTOM interface module can extract volume information in any order, because ExLM sorts volume information after receiving all volume information. A TMS CUSTOM interface module must call `LCMSTMCI` in AMODE(31). For more information about the linkage conventions and execution environment when a TMS CUSTOM interface module calls `LCMSTMCI`, see "TMS CUSTOM Interface Module Entry Conditions" on page 77, "TMS CUSTOM Interface Module Linkage Conventions" on page 78, and "TMS CUSTOM Interface Module Return Conditions" on page 79.

LMSTMCI requires a TMCI record as its only parameter; for more information, see "TMCI Record" on page 373. In general, you should create TMCI records for most volumes defined to the TMS, including non-LSM scratch volumes and volumes for multi-volume data sets. Specifically, if ExLM manages a volume that is defined to the TMS, you should create a TMCI record for the volume, otherwise the volume is classified as an HSC-only volume and is not managed as you expect.

You should not, however, create TMCI records for volumes such as the following:

- Volumes that are defined to the TMS but do not physically exist (marked deleted).

- Volumes that will never reside in any LSM (reel tapes, for example).

When `LCMSTMCI` returns to the TMS CUSTOM interface module, general register 15 contains a return code described in Table 10.

Table 10. LCMSTMCI Return Codes

Return Code	Description
0	ExLM successfully stored information from the TMCI record.
4	At least one field in the TMCI record contained missing or invalid data. ExLM issues a message describing the error, and stores all valid information.
8	A terminating error occurred and the TMS CUSTOM interface module should release all acquired resources and return to ExLM, which has already issued an error message.
16	An MVS STOP command was issued. The TMS CUSTOM interface module should release all acquired resources and immediately return to ExLM, which ignores the return code and immediately terminates.

Creating an LCMITMSG Subroutine

You can create an `LCMITMSG` subroutine to let a TMS CUSTOM interface module write messages to the standard ExLM message file. When `LCMITMSG` is invoked, ExLM issues message LCM0700I with the message text provided by `LCMITMSG`. If the parameter list passed to the TMS CUSTOM interface module contains errors, the address of the `LCMITMSG` subroutine may not be available. In these cases, the TMS CUSTOM interface module can issue a WTO to route a message to the ExLM joblog and or to the system console.

The TMS CUSTOM interface module calls `LCMITMSG` with a standard parameter list containing addresses of the following:

- A signed fullword that is the length of the text (maximum of 100 characters).

- The text itself.

When `LCMITMSG` returns to the TMS CUSTOM interface module, general register 15 contains a return code described in Table 11.

Table 11. LCMITMSG Return Codes

RC	Description
0	The message was successfully issued.
4	The message text was truncated.
8	A terminating error occurred and the TMS CUSTOM interface module should release all acquired resources and return to ExLM, which has already issued an error message.
16	An MVS STOP command was issued. The TMS CUSTOM interface module should release all acquired resources and immediately return to ExLM, which ignores the return code and immediately terminates.

TMS CUSTOM Interface Module Entry Conditions

The following list describes the entry conditions for an ExLM custom interface module:

- ExLM invokes the module using problem program state and key, which is the same state and key as ExLM main task `LCMMAIN`. The module can temporarily switch to supervisor state (and/or key zero) if necessary for a short duration.

- If the module requires APF authorization, it should first invoke the MVS `TESTAUTH` function to determine if it is running APF authorized and respond accordingly.

- ExLM operates primarily in AMODE(31) and also invokes interface modules in AMODE(31). If an interface module requires AMODE(24), it must perform the addressing mode switch internally. Also, if an interface module uses conventional data management routines such as QSAM or BSAM, or otherwise requires residency below the 16-megabyte line, it should be link-edited with RMODE(24).

- ExLM establishes an ESTAE exit during initialization. This exit remains active throughout ExLM's execution and is active when ExLM invokes an interface. An interface module can establish its own ESTAE exit if required, but should not cancel or bypass the ExLM ESTAE exit. If an interface module abends, ExLM's ESTAE exit must be permitted to receive control (directly or via cascading of ESTAE control) to allow ExLM to perform any required post-abend processing.

- ExLM only makes one call to an interface module for a specific `TMS CUSTOM` statement. The interface module, therefore, does not have to be reentrant, refreshable, or serially reusable. If multiple `TMS CUSTOM` statements use the same module, ExLM reloads the module before each invocation.

- Before returning to ExLM, an interface module must release all acquired resources and return the execution environment to its original state.

TMS CUSTOM Interface Module Linkage Conventions

ExLM invokes the interface module for a specific `TMS CUSTOM` statement only once, passing several parameters to it using standard MVS linkage conventions. When ExLM invokes an interface module, general purpose registers 1, 13, 14, and 15 contain the following values, all of which are 31-bit addresses:

- Register 1 contains the address of a variable-length parameter list.

- Register 13 contains the address of a standard 72-byte register save area aligned on a fullword boundary.

- Register 14 contains the address to which control should be returned when the interface module completes execution.

- Register 15 contains the entry point address of the interface module itself.

The parameter list pointed to by general register 1 on entry to a custom interface module is a sequence of fullword (31-bit) addresses aligned on fullword boundaries. All addresses except the last address in the list contain a 0 in their high-order bit. The last address contains a 1 in its high-order bit. Each address in the list points to the corresponding parameter that is passed to the interface module.

These parameters can reside above the 16MB line, and instructions addressing them should execute in AMODE(31). In all cases, the value of a parameter list address should be compared to zero before its use: a value of zero in the parameter list (not counting the high-order bit) indicates that the corresponding parameter has not been supplied. For more information about these parameters, see "TMS CUSTOM Interface Module Parameters" on page 80.

The content of general register 0 and general registers 2 through 12 are unpredictable. If ExLM is running under the MVS/ESA operating system, all address space registers contain the ALET of the home address space.

TMS CUSTOM Interface Module Return Conditions

On completion, the interface module must set a return code in general register 15 as described in Table 12.

Table 12. Interface Module Return Codes

RC	Description
0	All operations completed successfully; ExLM processing continues.
4	A non-terminating error occurred; ExLM issues message `LCM0100W` and continues processing. When ExLM execution completes, the final condition code is at least 4 (higher if more severe errors are also encountered).
8	A terminating error occurred; ExLM issues message `LCM101E` and terminates immediately with a condition code of 8.

On return to ExLM, all general registers (with the exception of general register 15) and all address space registers (under MVS/ESA) must contain the values they had upon entry to the TMS CUSTOM interface module.

TMS CUSTOM Interface Module Parameters

Table 13 describes the required parameters for a TMS CUSTOM interface module.

Table 13. TMS CUSTOM Parameters

Parameter	Description
version	A twenty (20) character field containing the current version, release, and modification level of ExLM.
lcmstmci_epa	The entry point address of subroutine LCMSTMCI; for more information, see "Creating an LCMSTMCI Subroutine" on page 75.
lcmitmsg_epa	The entry point address of subroutine LCMITMSG; for more information, see "Creating an LCMITMSG Subroutine" on page 76.
ddname	An eight character field, capitalized and padded to the right with blanks, which is the ddname specified on the DDNAME parameter of the TMS CUSTOM statement; for more information, see " TMS CUSTOM" on page 173. If this parameter is all blanks or if the corresponding address in the parameter list is binary zeros, no value was specified for DDNAME (the DSNAME parameter was specified instead)
tmsname	A ten character field, capitalized and padded to the right with blanks, which is the TMS name specified on the NAME parameter of the TMS CUSTOM statement; for more information, see " TMS CUSTOM" on page 173. If this parameter is all blanks, or if the corresponding address in the parameter list is binary zeros, no value was specified for NAME.
tmsparm	A variable-length string (from zero to fifty characters in length), which is the text string specified by the PARM parameter of the TMS CUSTOM statement. The value of *text* is preceded by a signed halfword value equal to the length of the specified text (not including the two-byte length value). If the length prefix is equal to zero or if the corresponding address in the parameter list is binary zeros, no value was specified for PARM.
modname	An eight character field, capitalized and padded to the right with blanks, which is the name of the TMS CUSTOM interface module specified by the MODNAME parameter of the TMS CUSTOM statement. If this parameter is all blanks or if the corresponding address in the parameter list is binary zeros, no value was specified for MODNAME.
EFACOUNT	A halfword integer that indicates the number of extended fields supported by ExLM. It determines the size of the table pointed to by EFAREF.
EFAREF	A table of one-byte entries that indicates which extended fields have been referenced in the parameter file. Each extended field has a key value, which is used as an offset into this table. If the corresponding byte is 'Y', the field has been referenced in the parameter file and should be passed back to ExLM in the TMCIs for volume records.

The LCMUX01P DSECT provided in the ExLM SAMPLIB maps the parameter list described in Table 13.

All fields in this DSECT are 31-bit addresses that point to the corresponding parameter. Parameters pointed to by these addresses can reside above the 16MB line. The first address in the parameter list containing a 1 in its high-order bit position is the final parameter of the

list. Any attempt to access storage beyond the final parameter list address may cause a storage protection violation.

Testing a TMS CUSTOM Interface Module

To test a TMS CUSTOM interface module, StorageTek recommends that you:

- Run ExLM in CHECK mode. For more information, see "OPTIONS" on page 126.

- Create a `DEBUG WRITETMCI` statement in the ExLM parameter file to validate the information passed to the TMS CUSTOM interface module as shown below:

DEBUG WRITETMCI;

This statement causes ExLM to write a copy of each TMCI record it receives to ddname `LCMTMCI` before performing any other operation. You must include ddname `LCMTMCI` in the ExLM JCL when you create a `DEBUG WRITETMCI` statement. The data set identified by ddname `LCMTMCI` must have sufficient space for all TMCI records passed to ExLM from the `TMS CUSTOM` statement. The data set can have fixed or varying length records, providing that the record length can accommodate any TMCI record. The default data set attributes for the `LCMTMCI` data set are as follows:

- Sequential data set organization (DSORG=PS).

- Varying length blocked records (RECFM=VB).

- Logical record length of TMCI_MAXIMUM_L+4 (LRECL=4100).

- The block size depends on the type of DASD device used for the data set.

See the following sample `LCMTMCI DD` statement:

```
//LCMTMCI DD DISP=(NEW,CATLG),

//      DSN=TMCI.DATA.SET,

//      DCB=(RECFM=VB,LRECL=255,BLKSIZE=6160),

//      SPACE=(CYL,(100,100),RLSE),

//      UNIT=SYSALLDA
```

After you verify the operation of a TMS CUSTOM interface module, remove the `DEBUG WRITETMCI` statement and accompanying `LCMTMCI DD` statement from the ExLM job.

TMSs Supported through the Custom Interface

Table 14 describes vendor-supplied support for TMSs through the Custom Interface. You must obtain the module listed in the third column from your software vendor. For more information on the statement parameters, see " TMS CUSTOM" on page 173.

Table 14. TMSs Support through the Custom Interface

TMS	Vendor	TMS CUSTOM MODNAME **Value**	TMS CUSTOM PARM **Value**
Automedia for MVS	Allen Systems Group	ZARALCMX	'SUBSYS=ZARA'
Control-T	BMC Software, Inc	CTTXLM	n/a

Using ExLM with Open Systems Clients

The TMS OPEN interface allows the ExLM Content Manager to access and process tape metadata for platforms that don't conform to MVS, OS/390, or z/OS specific standards. The TMS OPEN interface is defined by XML request and response documents. These documents provide information to the ExLM Content Manager concerning the tape metadata you wish to process. When a TMS OPEN statement is invoked during an ExLM run, the ExLM Content Manager does the following:

1. Sends a request to the remote host for an interface definition response. The request is in the form of a TMS Interface Definition Request document formatted to XML 1.0 specifications. The request document contains information from the TMS OPEN statement that the remote host can process. The expected response from the remote host is an XML formatted document that contains information regarding how the tape metadata will be presented. This document is called the TMS Interface Definition Response document.

   For more information, see:

   • "TMS Interface Definition Request Document" on page 85

   • "TMS Interface Definition Response Document" on page 87

2. When the ExLM Content Manager is ready to retrieve tape metadata for the TMS OPEN interface, the Content Manager sends a request to the remote host for a tape information response. The request is in the form of a TMS Tape Information Request document formatted to XML 1.0 specifications. The request document indicates which volume fields ExLM can use and provides information from the TMS OPEN statement. The expected response from the remote host is an XML formatted document that contains metadata for tape volumes. This document is called the TMS Tape Information Response document.

   For more information, see:

   • "TMS Tape Information Request Document" on page 89

   • "TMS Tape Information Response Document" on page 91

All request documents sent to the remote host are UTF-8 encoded. All response documents sent from the remote host must also be UTF-8 encoded. The XML parser within ExLM supports all UTF-8 encoded documents. However, the response documents are translated to EBCDIC during parsing and the EBCDIC character set does not support any UTF-8 encoded character above 0x7F. If ExLM Content Manager encounters any UTF-8 encoded character above 0x7F it will replace that character with 0x4B.

Within the ExLM SAMPLIB dataset are three members that will allow you to perform an example run of the TMS OPEN statement when used in conjunction with each other. They are as follows:

   • LCMTTIR – This is a TMS Tape Information Response document that contains sample tape metadata that can be sent from a remote host to the ExLM Content

Manager. The SAMPLIB member LCMTIDR defines how the tape metadata is organized within this document.

- LCMTIDR – This is a TMS Interface Definition Response document. This document can be sent from a remote host in order to define the sample tape metadata that is contained within the SAMPLIB member LCMTTIR.

- LCMCGI – This is a sample CGI script that can be used with any HTTP server that supports the CGI specification (go to www.w3c.org for more information concerning CGI). This script was written in C. The code is well documented and explains how to retrieve and process ExLM request documents.

TMS Interface Definition Request Document

To issue the request for a TMS OPEN interface definition, ExLM builds a request document and attempts to contact the specified host using the POST method. The request document provides information about the version and release of ExLM and information from TMS statement parameters.

For example, if ExLM is processing the following TMS statement from its parameter file:

```
tms open name(MyTms)
agent(http://mytms.mydomain:3002/tms/mytms/ExLM.cgi)
parm('c:tms\mytms\dbase select(all)debug');
```

Then ExLM builds the following request document:

```
<?xml version="1.0"?>
<tmsinterfacedefinitionrequest>
      <accesscodes>
       <accesscode>
tmsaccess D2=s5k92$32Q195583a-58$2lbs0C8 MVShost.net
         </accesscode>
         <accesscode>
tmsaccess D2=s5k92$32Q195583a-58$2lbs0C8 authp390
         </accesscode>
         <accesscode>
tmsaccess D2=s5k92$32Q195583a-58$2lbs0C8 pats.httptms.com
       </accesscode>
    </accesscodes>
    <version>EXLM 6.2.0</version>
    <name>MyTMS</name>
    <parm>c:\tms\mytms\dbase select(all) debug</parm>
</tmsinterfacedefinitionrequest>
```

ExLM then POSTs the request to the IP address or host name, port, and URI identified by the AGENT parameter of the TMS OPEN statement:

```
"POST /tms/mytms/ExLM.cgi HTTP/1.1"
```

The remote host validates the TMS parameters from the request document and then returns a response document as described in "TMS Interface Definition Response Document" on page 87.

Element Tag Descriptions

`accesscodes`

Contains a list of accesscode element tags that correspond to each access code defined within the LCMSECUR file. These codes can be used to validate a client's access rights to the remote host. See "Installing and Configuring ExLM Agent" in *ExLM Installation and Maintenance Guide* in order to see how these access codes are used by ExLM. Utilizing these codes is completely optional.

`accesscode`

Contains a single access code that can be used to validate a client's access privileges to the remote host.

`version`

Contains the current version, release, and modification level of ExLM.

`name`

The value specified for the `NAME` parameter of the `TMS OPEN` statement. In a multi-TMS environment, this character string can be used in messages to help identify which tape management system is being processed.

`parm`

The text specified on the PARM parameter of the TMS statement. This parameter provides a way for ExLM customers to specify information on the `TMS OPEN` statement for use by an implementation-dependent TMS interface. The designer of the interface assigns meaning to this text. ExLM does not assign any meaning to the value of this text.

Additional tags may be supplied in the future. It is recommended that implementers write code that ignores any tags it does not understand.

TMS Interface Definition Response Document

The response is sent back to ExLM as an XML document that contains record types, messages as needed, and a return code.   The returned document must conform to the `TmsInterfaceDefinitionResponse.dtd` as described in "TMS OPEN Document Type Definitions (DTDs)" on page 95.

A tmsinterfacedefinitionresponse root element tag can contain one or more record type element tags, and zero or more message element tags. The TMS Interface Definition Response document must include at least one record type element tag. The final element tag (immediately before the end root element) in the response document must be a returncode element tag: a value of 0 indicates success, 4 indicates that ExLM continues processing normally but ends with a warning code, and anything greater then 4 indicates that ExLM terminates immediately with an error condition.

The following shows a sample response document:

```
<?xml version="1.0"?>
  <tmsinterfacedefinitionresponse>
    <recordtypes>
      <record type = "base">
        <selectedfields>
          <selectfield>userTime1</selectfield>
          <selectfield>Scratch</selectfield>
          <selectfield>DatasetName</selectfield>
           [... other fields as desired ...]
        </selectedfields>
      </record>
      <record type = "secondary">
        <selectedfields>
          <selectfield>Scratch</selectfield>
          <selectfield>CreationDate</selectfield>
          <selectfield>CreationTime</selectfield>
          <selectfield>LocName</selectfield>
          <selectfield>DatasetName</selectfield>
          <selectfield>UserChar2</selectfield>
        </selectedfields>
      </record>
    </recordtypes>
<!--********************************************************
    *Dynamic field definition
    ******************************************************** -->
    <fielddefinitions>
     <field name="BackupPool">
    <datatype>char</datatype>
    <aliases>
     <alias>BPool</alias>
    </aliases>
    <xmlinputsize>4</xmlinputsize>
    </field>
    </fielddefinitions>
    <message>TMS0002I TMS Interface Processed Successfully</message>
    <returncode>0</returncode>
      </tmsinterfacedefinitionresponse>
```

Element Tag Descriptions

recordtypes
> Contains a list of record element tags that define how the tape metadata will be
> presented.

record
> Defines a specific type of tape metadata and describes how it is organized.

selectedfields
> Contains a list of selectfield element tags that describe what fields are included
> within a specific type of tape metadata, and also the order in which the fields are
> given. The order of each field is determined based on the order of each selectfield
> element tag. For example, in the example below there are three selectfield element
> tags for the record type *base*:

```
<record type = "base">
  <selectedfields>
    <selectfield>userTime1</selectfield>
    <selectfield>Scratch</selectfield>
    <selectfield>DatasetName</selectfield>
  </selectedfields>
</record>
```

> Based on this record type, it is assumed that when the tape metadata of this record
> type is sent to ExLM, the first field value within the metadata will be of field type
> UserTime1, the second field value will be of field type Scratch, and the third field
> value will be of field type Datasetname.

selectfield
> Contains a single fieldname that represents a field value for which the tape metadata
> of the same record type contains. For a list of all fields that are allowed when using
> the TMS OPEN statement, please refer to the *ExLM Quick Reference Field Table*s
> documentation. Please note that it is not necessary to include the Serial field as one
> of the fields referenced. This is because it is a required element attribute of the
> volume element tag in the TMS Tape Information Response document and therefore
> implies that the Serial field is a mandatory field.

fielddefinitions
> Contains dynamic field definition element tags. For more information, see
> "Dynamically Added Volume Fields" on page 94.

message
> Contains a text message that will be sent to ExLM. This message will be displayed in
> the LCMMSGS file within each ExLM run that uses the TMS OPEN interface. The
> message text will be prepended with ExLM message id **LCM0700I.**

returncode
> Contains a return code that will be sent to ExLM. The return code can be in the range
> of 0 – 1000. If the return code specified is greater than 0 but less then or equal to 4,
> ExLM will issue the message ID LCM0116W. This message will contain the TMS
> name and return code that was specified. If the return code is greater than 4, ExLM
> will issue the message ID LCM0117E and will terminate immediately with a return

code of 8. The return code element tag is required at the end of every response document but multiple return codes can be specified. If more than one return code element tag is specified, ExLM will only process the largest one. At least one message element should be included if the return code is non-zero.

TMS Tape Information Request Document

When the ExLM Content Manager is ready to retrieve tape metadata for a TMS OPEN interface, the ExLM Content Manager builds and sends to the remote host a TMS Tape Information Request document that contains information from the TMS OPEN statement, a list of referenced fields, and a list of volume serials for which information is being requested. An example of a TMS Tape Information Request document is as follows:

```
<?xml version="1.0"?>
  <tmstapeinformationrequest>
    <version>EXLM 6.2.0</version>
    <name>MyTMS</name>
    <parm>c:\tms\mytms\dbase select(all) debug</parm>
    <fieldsreferenced>
      <field>Scratch</field>
      [... other fields to be requested ...]
    </fieldsreferenced>
    <serials>
      <serial>*</serial>
    </serials>
  </tmstapeinformationrequest>
```

ExLM POSTs this request document to the IP address or host name, port and URI indicated by the AGENT parameter of the TMS OPEN statement:

```
"POST /tms/mytms/ExLM.cgi HTTP/1.1"
```

Element Tag Descriptions

version
>   Contains the current version, release, and modification level of ExLM.

name
>   The value specified for the NAME parameter of the TMS OPEN statement. In a multi-TMS environment, this character string can be used in messages to help identify which tape management system is being processed.

parm
>   The text specified on the PARM parameter of the TMS statement. This parameter provides a way for ExLM customers to specify information on the TMS OPEN statement for use by an implementation-dependent TMS interface. The designer of the interface assigns meaning to this text. ExLM does not assign any meaning to the value of this text.

fieldsreferenced
>   A list of volume fields for which ExLM is requesting information. The field names are the same volume fields listed in the ExLM Quick Reference Field Tables, plus

any additional fields that were referenced in the ExLM run. This list can be used to avoid sending back information that is not needed.

`field`
>Contains an individual field that is being requested within a fieldsreferenced element tag.

`serials`
>Identifies volume serial(s) for which information is being requested.

`serial`
>A volume serial can be specified as an individual volume serial number, as a generic reference using asterisks and question marks as wildcards, or as a range with high and low volume serial numbers separated by a dash. The reference can be specified as an include or as an exclude. The syntax for a serial tag is:

```
<serial ref=[include|exclude]>serial-specification</serial>
```

>Examples of valid serial values include:

```
<serial>*</serial> <!--include all volumes in the response-->
<serial>SYS?BK</serial> <!--include serials that match this
pattern-->
<serial>H*</serial> <!--include all volumes beginning with H -->
<serial>H05000-H00999</serial> <!--include volumes in this range -->
<serial ref=exclude]>CLN*</serial> <!--include all but CLN carts -->
```

>Additional tags may be supplied in the future. It is recommended that implementers write code that ignores any tags it does not understand.

TMS Tape Information Response Document

The remote host responds to a TMS Tape Information Request document with a document that contains volume elements, one or more message elements, and a return code element. Volume information is returned using volume element tags, where the character data of each volume element is a comma-separated list of field values in the same order defined by the record element tag within the TMS Interface Definition Response document. Message elements may appear anywhere in the document. The return code element allows the host to specify status codes. At least one return code element tag must be included at the end of the response document.

The following TMS Tape information Response document assumes that the TMS Interface Definition Response document is the same as the sample given in "TMS Interface Definition Response Document" on page 87.

```
<?xml version="1.0"?>
  <tmstapeinformationresponse>
    <message>Processing volume info</message>
    <volumes>
      <volume serial = "A07303" type = "base">
05:12:22 PM,N,BACKUP.LOG.SRV          <!--this is the tape metadata -->
      </volume>
      <volume serial = "T00001" type = "secondary">
N,10/25/2002,12:10,LIB,TDATA.TEST,Transfer
      </volume>
      <volume serial = "G03433" type = "base">
22:54,y,Dbase.trial.v2.ext
      </volume>
      <volume serial = "T00002" type = "secondary">
n,10/26/2002,16:17,onsite,TDATA.ACT.PR10
      </volume>

      [- additional volume elements as needed -]

    </volumes>
    <message>Volume info processed</message>
    <returncode>0</returncode>
  </tmstapeinformationresponse>
```

Element Tag Descriptions

`volumes`
> Contains a list of volume element tags that hold actual tape metadata to be processed by ExLM Content Manager.

`volume`
> A single volume element that holds a volume record. The volume record is formatted as a group of field values delimited by commas. Each field value corresponds to specific referenced field within the TMS Interface Definition Response document of the same record type.

`attributes (all element attributes are mandatory)`

> `serial`
>> This is the specified volser of the specific volume record that is being processed. The maximum length of this field is 6 characters.

> `type`
>> This attribute allows ExLM to match the tape metadata with a defined record type. This attribute corresponds to the record element tag of the same type in the TMS Interface Definition Response document.

`message`
> Contains a text message that will be sent to ExLM. This message will be displayed in the LCMMSGS file within each ExLM run that uses the TMS OPEN interface. The message text will be prepended with ExLM message id LCM0700I.

`returncode`
> Contains a return code that will be sent to ExLM. The return code can be in the range of 0 – 1000. If the return code specified is greater than 0 but less then or equal to 4, ExLM will issue the message ID LCM0116W. This message will contain the TMS name and return code that was specified. If the return code is greater than 4, ExLM will issue the message ID LCM0117E and will terminate immediately with a return code of 8. The return code element tag is required at the end of every response document but multiple return codes can be specified. If more than one return code element tag is specified, ExLM will only process the largest one. At least one message element should be included if the return code is non-zero.

Information regarding tape metadata within a volume element tag:

- Boolean values must be coded as a single character. 'Y' or 'y' represents a true value and 'N' or 'n' represents the false value. If any other single character value is coded, a false value is assumed.

- All date fields can be coded in the formats listed in the table below. Note: special date formats should be coded as described in the "TMCI_EXPIREDATE special Formats" part of this manual.

Date Type	Format	Example
Gregorian	MM/DD/YYYY	12/25/2002
Julian	YYYYDDD	2002359
Juliand	YYYY.DDD	2002.359
Normal	DD MMM YYYY	25 DEC 2002
Sgregorian	MM/DD/YY	12/25/02
Sjulian	YYDDD	02359
Sjuliand	YY.DDD	02.359
Snormal	DD MMM YY	25 DEC 02
Sortdate	YYYY-MM-DD	2002-12-25
Ssortdate	YY-MM-DD	02-12-25
SASdate7	DDMMMYY	25DEC02
SASdate9	DDMMMYYYY	25DEC2002

- All time fields can use any format specified in the table below. Please note that the CreationTime field (which is part of the base TMCI) must be specified with the format type HHMM.

Time Type	Format	Example
Civilian	HH:MM:SS AM/PM	01:43:23 PM
HHMM	HH:MM	13:43
HHMMSS	HH:MM:SS	13:43:23
HHMMSSTH	HH:MM:SS.TH	13:43:23.12

- Any fields that are blank at the end of a single volume record do not have to be separated with commas. These fields will by default take blank values.

Dynamically Added Volume Fields

For those situations where there isn't any ExLM predefined field that accurately corresponds to a volume field within the open systems TMS, it is possible to dynamically define a field to be used by ExLM. These fields are defined within the TMS Interface Definition Response Document. To see a description of all the XML element tags used to create a dynamic volume field, please refer to the table in appendix E. Also, please refer to the TMS Interface Definition Response Document DTD to see the allowed structure of the dynamic volume field element tags. For more information, see "TMS Interface Definition Response DTD" on page 95.

When a TMS OPEN Agent adds new volume fields, those fields can be accessed in the parameter file by specifying *tmsname.fieldname*. For example, the following parameter file syntax would be valid:

```
tms open name(SystemX) agent(http://mytms.mydomain/tms.cgi);
report volume
     when(SystemX.Application = 'MMIS/ProdCtl/ChgMan')
     column(serial, ReferenceTmsDate, SystemX.owner, SystemX.Description);
```

Given such a parameter file, ExLM would communicate with the specified Agent and then use the list of fields added by SystemX to validate volume field references in other statements.

ACTION statements, SET METHOD statements, and REPORT VOLUME statements can all use dynamically added volume fields.

Because the dynamically added fields rely on information from the TMS OPEN host, it is required that the TMS OPEN statement be defined and processed before any dynamically added volume fields are specified within the parameter file.

TMS OPEN Document Type Definitions (DTDs)

The following DTDs are used to validate the TMS Interface Definition Response and the TMS Tape Information Response XML documents that are sent by the TMS host specified in the TMS OPEN statement.

TMS Interface Definition Response DTD

```
<!ELEMENT tmsinterfacedefinitionresponse
    fielddefinitions? , ( message* | recordtypes | returncode+ )* >
<!ELEMENT message ( #PCDATA ) >
<!ELEMENT returncode ( #PCDATA ) >
<!ELEMENT recordtypes ( record+ ) >
<!ELEMENT record ( selectedfields ) >
<!ELEMENT selectedfields ( selectfield+ ) >
<!ELEMENT selectfield ( #PCDATA ) >
<!ELEMENT fielddefinitions ( field+ ) >
<!ELEMENT field   ( aliases |  collate | datatype | defaultoutputsize |
defaultsummarytype |  description | headings | possiblevalues |
xmlinputsize )* >
<!ATTLIST field  name  CDATA   #REQUIRED >
<!ELEMENT aliases ( alias+ ) >
<!ELEMENT collate ( #PCDATA ) >
<!ELEMENT datatype ( #PCDATA ) >
<!ELEMENT defaultoutputsize ( #PCDATA ) >
<!ELEMENT defaultsummarytype ( #PCDATA ) >
<!ELEMENT description ( #PCDATA ) >
<!ELEMENT headings ( h+ ) >
<!ELEMENT h ( #PCDATA ) >
<!ELEMENT possiblevalues ( pd | pv )* >
<!ELEMENT pd  ( #PCDATA ) >
<!ELEMENT pv ( #PCDATA ) >
```

TMS Tape Information Response DTD:

```
<!ELEMENT tmstapeinformationresponse
            (message* | volumes | returncode+ ) >
<!ELEMENT message ( #PCDATA ) >
<!ELEMENT returncode ( #PCDATA ) >
<!ELEMENT volumes ( volume* ) >
<!ELEMENT volume ( #PCDATA ) >
<!ATTLIST volume serial CDATA   #REQUIRED
            type   CDATA   #REQUIRED >
```

Chapter 4. ExLM Management Control Statements

This chapter contains reference information for the following ExLM control statements:

DATASET

The DATASET statement specifies a data set name, management method, and report production for nonscratch volumes associated with that data set.

Syntax
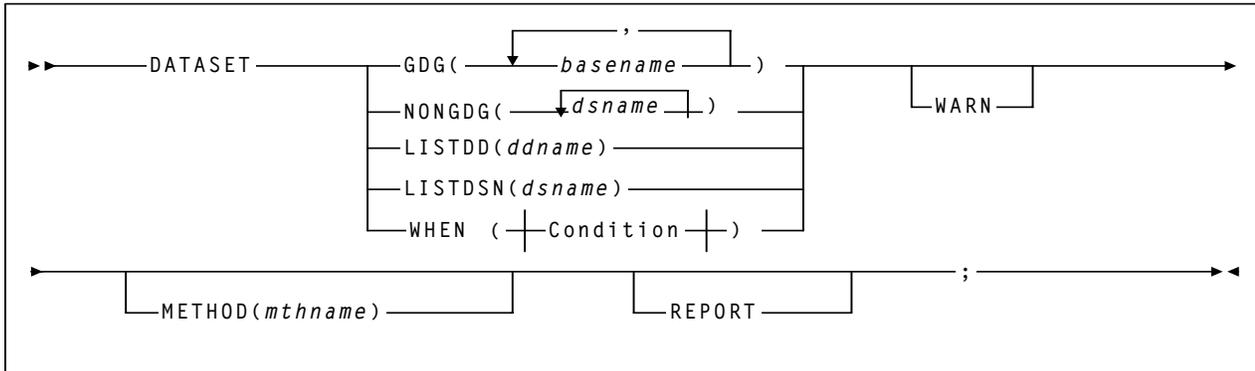
Figure 25. DATASET Statement Syntax

Parameters

Table 15 lists the valid abbreviations for the `DATASET` statement.

Table 15. DATASET Statement Abbreviations

Statement or Parameter	Abbreviation
DATASET	DS
METHOD	MTH
REPORT	RPT

`GDG`

specifies one or more tape generation data group (GDG) base names.

basename

the GDG base name.

In general, specify a base name as a data set identifier according to the syntax rules described in "data set identifier" on page 21 and the following guidelines:

* Specify a base name as a generation data group base name, not as a generation data set true name. That is, do *not* specify a base name that has a suffix qualifier of the form G*nnnn*V*nn* where *nnnn* and *nn* are four-digit and two-digit decimal numbers, respectively.

* Do not specify a basename that consists of more than 35 characters, including periods.

* Do not specify identical base names for the `GDG` parameters of two or more `DATASET` statements in the same parameter file. You can, however, specify a base name that is identical to a dsname coded for the `NONGDG` parameter of another `DATASET` statement in the same parameter file.

* You must specify at least one base name. Separate multiple base names with one or more blanks.

`NONGDG`

specifies one or more nongeneration tape data set names.

dsname

the data set name.

Specify the data set name as follows.

* Do not code a *dsname* that has a suffix qualifier of the form G*nnnn*V*nn* where *nnnn* and *nn* are four-digit and two-digit decimal numbers, respectively, which is the suffix for a generation data set.

* Do not specify identical *dsnames* for the `NONGDG` parameters of two or more `DATASET` statements in the same parameter file. You can, however, specify a

dsname that is identical to a basename coded for the `GDG` parameter of another `DATASET` statement in the same parameter file

- You must specify at least one dsname. Separate multiple base names with one or more blanks.

- ExLM allows the following data set name wildcards:

  - % - any single character.

  - * - any qualifier or all suffixes of a qualifier.

  - ** - any sequence of qualifiers or all data set names.

LISTDD

specifies the ddname of a file that contains a list of data set identifiers for this DATASET statement.

ddname

specifies the ddname of the JCL DD statement that is allocated to the sequential file containing the data set list.

LISTDSN

specifies the data set name of a file that contains a list of data set identifiers for this DATASET statement.

dsname

- specifies the data set name of the sequential file containing the data set list.

Note: GDG, NONGDG, LISTDD, and LISTDSN are mutually exclusive parameters. You must specify one (and only one) of the GDG, NONGDG, LISTDD, or LISTDSN parameters.

A data set list is a file that contains one data set identifier per line. Each line in a data set list must have the following format:

Column	Description
1	Character "G" to indicate GDG or "N" to indicate NONGDG.
2	Blank.
3-46	The data set identifier. Refer to the descriptions for GDG and NONGDG for details on specifying the data set identifier.

`WARN`

specifies that ExLM will issue a warning message if no data set is covered by this statement.

Note: If `WARN` is specified for a data set identifier that matches the controlling data set name of one or more volumes but does not cover any volumes, a warning message is still issued. This occurs if all data set names matched by the data set identifier are also matched by other, more specific data set identifiers.

`METHOD`

specifies the method that manages the volumes whose controlling data set is covered by this `DATASET` statement.

ExLM uses the specified method if no previous statement in the parameter file covers the same volume and specifies a method. You can override this method with the `OPTIONS` statement `EXTERNAL` or `METHODFILE` options or the `SET METHOD` statement. This method can be influenced by the `OPTIONS` statement `CYCLESOON`, `MINENTER`, and `MINREF` options.

For more information, see "OPTIONS" on page 126, "METHOD" on page 117, and "SET METHOD" on page 147.

mthname

the method name.

`REPORT`

specifies that all data sets covered by this `DATASET` statement are flagged for reporting. ExLM automatically produces a standard data set report for all flagged data sets unless the automatic report is suppressed with the `SUPAUTORPT` option on the `OPTIONS` statement; for more information, see "OPTIONS" on page 126. You can also customize the standard data set report.

Usage

To assign management methods to nonscratch volumes based on data set name, use the `METHOD` parameter of the `DATASET` statement. If no previous statements in the parameter file assign a method to these volumes, ExLM uses the specified method on the `DATASET` statement.

For example, to use the `BACKUPS` method to manage the volumes of all nonscratch generation data sets beginning with `BACKUP`, specify the following `DATASET` statement:

```
DATASET GDG(BACKUP.**) METHOD(BACKUPS) ;
```

Only one `DATASET` statement covers a specific nonscratch volume. If more than one *dsname* or `basename` parameter matches a specific data set name, the `DATASET` statement having the most specific match is used. Thus, the order in which you specify `DATASET` statements in a parameter file is irrelevant.

The order of `DATASET` statements relative to other types of statements that assign methods to volumes is important, however. ExLM uses the first statement that covers a nonscratch volume and assigns it a method. If, for example, you want the location of a volume to assign a method, either specify a `LOCATION` statement covering a volume before the `DATASET` statement covering that same volume or only specify a `LOCATION` statement covering the volume. Note that if no statement assigns a method, ExLM uses the predefined method `STANDARD` to manage that volume.

The order of `DATASET` statements relative to other types of statements that assign methods to volumes is important, however. ExLM uses the first statement that covers a nonscratch volume and assigns it a method. If, for example, you want the location of a volume to assign a method, either specify a `LOCATION` statement covering a volume before the `DATASET` statement covering that same volume, or only specify a `LOCATION` statement covering the volume.

Notes:

- If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

- ExLM provides tape data set management for *only* nonscratch volumes residing in an LSM managed by ExLM and whose controlling data set name is defined to a TMS. HSC-only volumes, volumes in subpools defined with a `NOTMS` or `IGNORE` keyword, expired volumes, and volumes with a tape management scratch status of "scratch" *do not* have a controlling data set name and are not covered by `DATASET` statements.

ExLM uses the controlling data set name to identify volumes covered by a `DATASET` statement. For more information on how the TMS determines the controlling data set name, see:

- "Using ExLM with CA-1" on page 44
- "Using ExLM with DFSMSrmm" on page 54
- "Using ExLM with CA-TLMS" on page 63

Hint: You can use the `WARN` parameter to "weed out" obsolete `DATASET` statements that no longer cover volumes associated with active data sets.

LOCATION

The `LOCATION` statement specifies a TMS volume location code, management method, and eject options for nonscratch volumes associated with that location.

Syntax
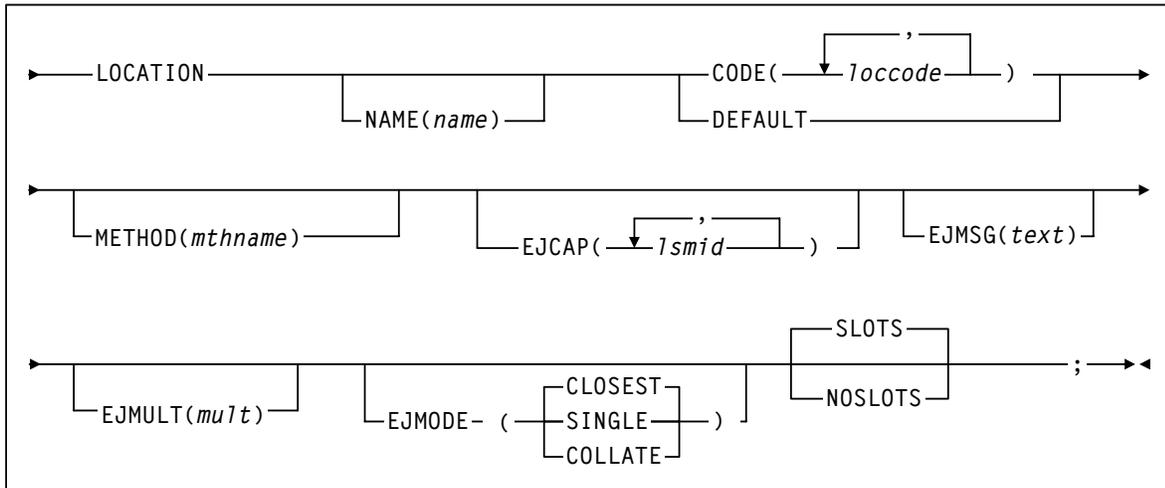
Figure 26. LOCATION Statement Syntax

Parameters

Table 16 lists the valid abbreviations for the `LOCATION` statement.

Table 16. LOCATION Statement Abbreviations

Statement or Parameter	Abbreviation
LOCATION	LOC
CODE	LOCCODE
NAME	LOCNAME
METHOD	MTH

`NAME`

> defines a name for this tape storage location. This name, unlike the location code, need not be unique; you can specify same location name on multiple `LOCATION` statements.
>
> The storage location name applies to all location codes covered by this `LOCATION` statement. If this `LOCATION` statement also specifies the `DEFAULT` keyword, the location name also applies to all location codes not covered by other `LOCATION` statements.
>
> If you do not specify `NAME`, it defaults to the location code (`CODE`) unless it is the blank location code. In this case, the default value is `Local`. You must specify `NAME` if you specify multiple location codes
>
> ***locname***
> > the 1 to 10 character storage location name. The name must contain at least one nonblank character.

`CODE`

> specifies a list of one or more tape storage location codes defined by the TMS.
>
> ***loccode***
> > the location code, which is a maximum of 8 characters. Separate multiple location codes with one or more blanks.
> >
> > Do not specify the same location code on more than one `LOCATION` statement or more than once on the same `LOCATION` statement. The `CODE` and `DEFAULT` parameters are mutually exclusive.
> >
> > All unexpired nonscratch volumes in the TMS that have the specified location code or location codes and are not in volumes in subpools defined with a `NOTMS` or `IGNORE` keyword are covered by this `LOCATION` statement.

DEFAULT

specifies that this LOCATION statement is the default for TMS location codes that do not have explicit LOCATION statements.

The CODE and DEFAULT parameters are mutually exclusive. Do not code more than one default LOCATION statement in the same parameter file.

METHOD

the method ExLM uses to manage nonscratch volumes covered by this LOCATION statement. The specified method applies if no previous statement in the parameter file covers the same volume and specifies a method. This method can be overridden by the EXTERNAL and METHODFILE options of the OPTIONS statement and the SET METHOD statement and may be influenced by the OPTIONS statement CYCLESOON, MINENTER, and MINREF options. For more information, see "OPTIONS" on page 126 and "METHOD" on page 117.

mthname

the name of the method.

EJMSG

specifies the text of the eject message (SLS1251E).

If you do not specify this parameter, ExLM uses a text of 'Location' followed by the location name. For example, if the location name is Vault1, the ExLM job name is EXLM and the CAP is 00:00, the ExLM issues the following messages issued when the CAP door is unlocked:

```
SLS0259A CAP PROCESSING TERMINATED; EMPTY CAPID 00:00

SLS1251E CAPID 00:00 (EXLM): LOCATION VAULT1
```

text

the message text, which is a maximum of 32 characters. Enclose the character string in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

EJCAP

specifies a list of one or more LSMs whose CAPs are used for ejects. If this list does not contain at least one LSM for each managed ACS, ExLM assumes that all LSMs in that ACS are available for use (which is also the default if you do not specify a value for EJCAP). LOCATION EJCAP overrides this setting on the OPTIONS statement.

lsmid

the hexadecimal LSM ID (00:00 to FF:7F). Note that you cannot specify individual CAPS within an LSM and ExLM will not use priority CAPs. You can, however, use the ExLM DISPLAY, PAUSE, RESUME, and REDIRECT

commands to manage ExLM activity for specific CAPs; for more information, see:

- "DISPLAY" on page 349
- "PAUSE" on page 351
- "RESUME" on page 354
- "REDIRECT" on page 353

EJMODE

specifies that ExLM uses the EJCAP list as follows:

CLOSEST

eject volumes through the CAPs closest to the volume location (the default).

SINGLE

eject volumes through the CAPs of only one LSM per ACS. ExLM tries to minimize pass-throughs when it selects an LSM from the EJCAP list.

COLLATE

eject volumes through the CAPs of the LSMs in the EJCAP list in ascending order. ExLM ejects the lowest ordered set of volumes from the first EJCAP, the next lowest ordered set of volumes is ejected from the second EJCAP, and so forth. ExLM will use as many of the LSMs in the EJCAP list as can be used at least once.

The EJMODE parameter is only valid if CAPs of multiple LSMs are included in the EJCAP list and are available. LOCATION EJMODE overrides this setting on the OPTIONS statement.

EJMULT

eject volumes in multiples specified by *mult*. For example, for EJMULT(10), ExLM ejects volumes in multiples of ten, which can include situations such as ejecting forty volumes at a time through an Enhanced CAP.

Hint: You can use EJMULT to force volume ejections in amounts that fit evenly into cases or magazines for transport. For example, to fill a 10-cell magazine evenly, specify EJMULT(10).

EJMULT has no effect on the selection of a CAP for eject processing. For example, specifying EJMULT(40) does not prevent ExLM from selecting a 21-cell CAP for ejection.

StorageTek recommends that you do *not* specify an EJMULT value that is larger than the capacity of the smallest CAP used. For example, if you specify EJMULT(40) and a 21-cell CAP is used for ejects, ExLM ejects volumes in batches of 40, which means that the operator has to empty the CAP twice (21 volumes followed by 19 volumes) for each batch of 40 volumes.

StorageTek also recommends that you do not specify large values (such as 200) for EJMULT. PAUSE commands (without the IMMED operand) do not take effect for a

specific CAP until the current batch has been ejected, so large `EJMULT` values increase the delay before `PAUSE` commands take effect. There is no impact on `PAUSE` commands that specify the `IMMED` operand.

The `EJMULT` parameter is only valid if CAPs of multiple LSMs are included in the `EJCAP` list and are available. `LOCATION EJMULT` overrides this setting on the `OPTIONS` statement.

> ### *mult*
> the multiple that ExLM uses to eject volumes. Valid values are 1 to 500 inclusive and the default is 1.

`SLOTS | NOSLOTS`
specifies whether ExLM volumes should be ejected by TMS slot numbers (`SLOTS`, the default) or by volsers (`NOSLOTS`).

Usage

You can specify an unlimited number of `LOCATION` statements in a parameter file to specify a TMS volume location code, the management method, and eject options for nonscratch volumes associated with that location.

Only one `LOCATION` statement covers a specific nonscratch volume, so the order of `LOCATION` statements in a parameter file is irrelevant. The order of `LOCATION` statements does affect the order of ejections, however. ExLM ejects volumes in the order in which the first `LOCATION` statement for each location name is coded in the parameter file.

The order of `LOCATION` statements relative to other types of statements affects method assignments. For example, if you want the location code of some volumes to determine the management method, either specify only `LOCATION` statements or specify the associated `LOCATION` statements before `DATASET` and `SUBPOOL` statements that also assign methods to those volumes. Conversely, if you do not want the `LOCATION` statement to assign a volume's management method, either do not specify `LOCATION` statements or do not specify a method on the `LOCATION` statement and do specify the method on another statement (such as `DATASET`). Note that if no statement assigns a method, ExLM uses the predefined method `STANDARD` to manage that volume.

Notes:

- If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

- ExLM tape location code support is provided only for unexpired nonscratch volumes that are not being ignored, reside in an LSM being managed by ExLM, and whose location code is defined to the TMS. HSC-only volumes, expired volumes, and volumes with a tape management scratch status of "scratch" do not have a location code and are not covered by `LOCATION` statements. The `EJCAP`, `EJMODE`, `EJMSG`, and `EJMULT` keywords are valid only once for each location name—on the first `LOCATION` statement that uses that location name.

For more information on using `LOCATION` statement with your TMS, see:

- "Using ExLM with the CA-1 Vault Management System" on page 47
- "Using ExLM with the DFSMSRMM Vital Record Specifications" on page 58
- "Using ExLM with the CA-TLMS Tape Retention System" on page 67

MANAGE PHYSICAL

The `MANAGE PHYSICAL` statement specifies an LSM group and management policies for the volumes and free cells in the LSMs in the group.

Syntax
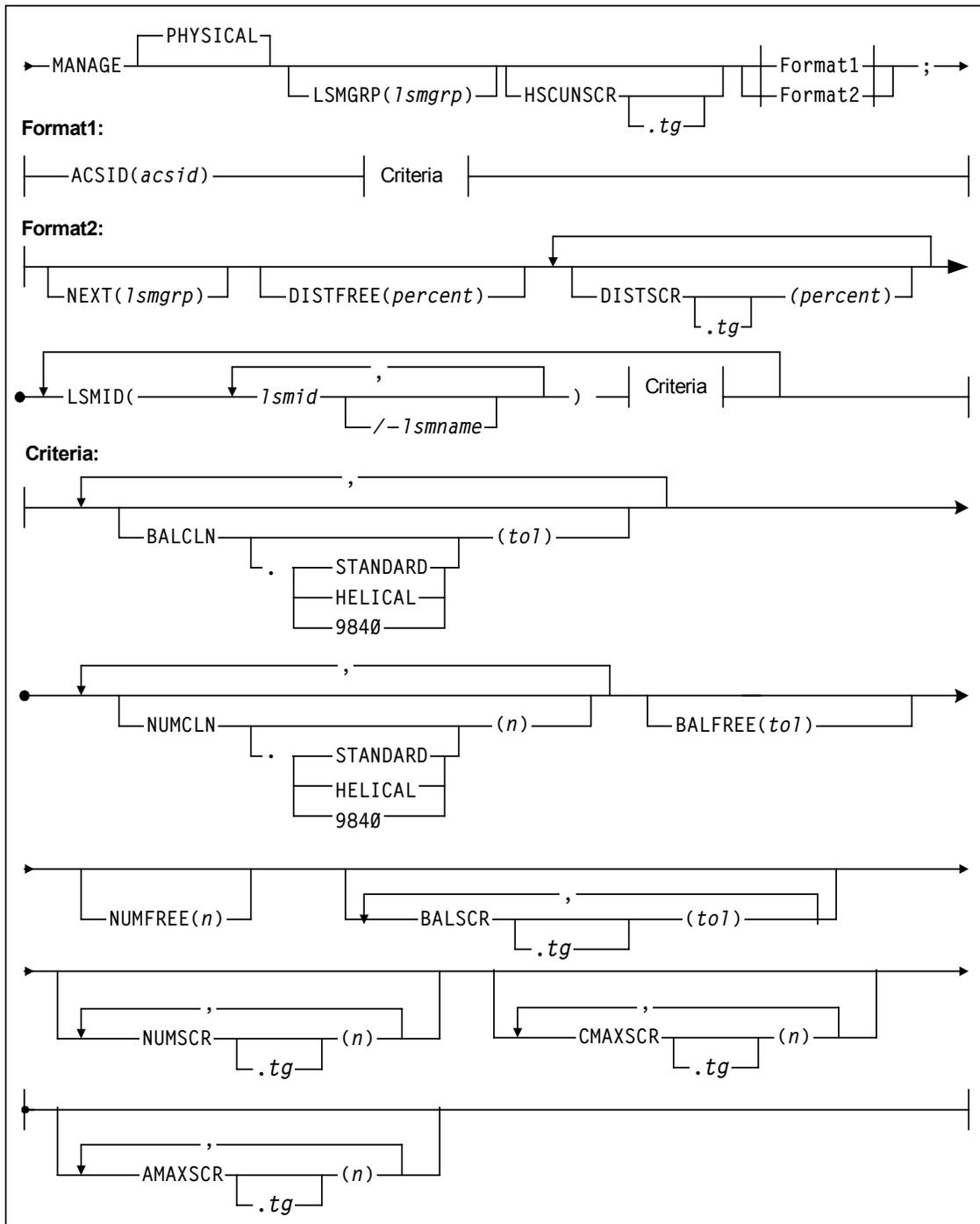
Figure 27. MANAGE PHYSICAL Statement Syntax

Parameters

LSMGRP
> specifies the unique name of the LSM group, which is a maximum of 10 characters.
>
> The default LSM group name is `LSMGRP` plus the number of the `MANAGE PHYSICAL` statement. For example, the default group name for the first `MANAGE PHYSICAL` statement is `LSMGRP1`.
>
> ***lsmgrp***
> > the LSM group name.

HSCUNSCR
> specifies that ExLM sets the HSC scratch status to "not scratch".
>
> You can mark scratch volumes as `HSCUNSCR` to prevent HSC from selecting them for scratch mounts (for example, to keep a reserve of scratch volumes in an ExtendedStore LSM).
>
> ***tg***
> > specifies the tape group. You can specify `HSCUNSCR` for multiple tape groups, but not multiple times for the same tape group.
> >
> > Specify tape groups if you have multiple subpools or if you have specified the `MEDIA` keyword on a `SUBPOOL` statement. If you do not specify tape groups, `HSCUNSCR` applies to all tape groups. If you do not specify tape groups and `SUBPOOL` statements, `HSCUNSCR` applies to tape group `GENERAL`.

ACSID
> specifies that an entire ACS is to managed by this statement and only applies to Format 1.
>
> ***acsid***
> > a hexadecimal ACS ID (x'00' to x'FF').

NEXT
> specifies the name of the LSM group below this group in an LSM group hierarchy and only applies to Format 2. ExLM demotes volumes (moves them down the hierarchy) as needed to make room in this LSM group.
>
> ***lsmgrp***
> > the LSM group.

DISTFREE
> specifies that ExLM distributes free cells among the LSM subgroups defined by this `MANAGE PHYSICAL` statement proportional to the specified `NUMFREE` value for each subgroup.

percent

>>as a percentage, how close to exact ExLM attempts to make this distribution. The larger the value, the less work ExLM will have to do to achieve a balance.

DISTSCR

>specifies that ExLM distributes scratch volumes among the LSM subgroups defined by this MANAGE PHYSICAL statement proportional to the specified NUMSCR value for each subgroup.

tg

>>Specifies the tape group. You can specify DISTSCR for multiple tape groups, but not multiple times for the same tape group.

>>Specify tape groups if you have multiple subpools or if you have specified the MEDIA keyword on a SUBPOOL statement. If you do not specify tape groups, DISTSCR applies to all tape groups. If you do not specify tape groups and SUBPOOL statements, DISTSCR applies to tape group GENERAL.

percent

>>as a percentage, how close to exact ExLM attempts to make this distribution. The larger the value, the less work ExLM will have to do to reach a scratch distribution.

LSMID

>defines an LSM subgroup consisting of one or more LSMs that ExLM manages using the same criteria. Any criteria following the LSM subgroup definition will apply to the LSM subgroup as a whole, not to each individual LSM in the subgroup.

lsmid

>>a hexadecimal LSM ID (00:00 to FF:7F).

lsmname

>>the name to use for this LSM in reports, which is 1 to 10 characters.

BALCLN

>specifies that ExLM balances the following types of cleaning cartridges across the LSMs specified by the ACSID or LSMID keyword.

STANDARD

>>standard cleaning cartridges (the default).

HELICAL

>>helical cleaning cartridges.

9840

>>9840 cleaning cartridges.

STK2W

>>9940 cleaning cartridges

tol

    specifies the cleaning cartridge balance tolerance as a non-negative integer. For example, `BALCLN` applies to 6 LSMs having a total of 12 cleaning cartridges. A "perfect" cleaning cartridge balance mean each LSM has 2 cleaning cartridges. A tolerance of 1 means that ExLM should consider the cleaning cartridges are balanced if each LSM contains 1 to 3 cleaning cartridges.

`NUMCLN`

specifies the levels for the following types of cleaning cartridges for the LSMs specified by the associated `ACSID` or `LSMID` keyword.

    `STANDARD`

        standard cleaning cartridges (the default).

    `HELICAL`

        helical cleaning cartridges.

    `9840`

        9840 cleaning cartridges.

    `STK2W`

        9940 cleaning cartridges

    n

        specifies the cleaning cartridge level as a nonnegative integer.

`BALFREE`

specifies that ExLM balances free cells across the LSMs specified by the `ACSID` or `LSMID` keyword.

    tol

        specifies the free cell balance tolerance as a non-negative integer. For example, `BALCLN` applies to 6 LSMs having a total of 90 free cells. A "perfect" free cell balance means each LSM has 15 free cells. A tolerance of 5 means that ExLM considers the free cells are balanced if each LSM contains 10 to 20 free cells.

        Even if you do not specify `BALFREE`, ExLM will try to keep free cells balanced as much as possible when selecting LSMs for enters and ejects.

`NUMFREE`

specifies the free cell level for the LSMs specified by the `ACSID` or `LSMID` keyword.

    n

        specifies the free cell level as a nonnegative integer.

`BALSCR`

specifies that ExLM balances scratch volumes across the LSMs specified by the `ACSID` or `LSMID` keyword.

tg

Specifies the tape group. You can specify `BALSCR` for multiple tape groups, but not multiple times for the same tape group.

Specify tape groups if you have multiple subpools or if you have specified the `MEDIA` keyword on a `SUBPOOL` statement. If you do not specify tape groups, `BALSCR` applies to all tape groups. If you do not specify tape groups and `SUBPOOL` statements, `BALSCR` applies to tape group `GENERAL`.

tol

specifies the scratch volume balance tolerance as a non-negative integer. For example, `BALSCR` applies to 6 LSMs having a total of 90 scratch volumes in subpool a and 60 scratch volumes in subpool b. A "perfect" scratch volume balance means each LSM has 15 scratch volumes in subpool a and 10 scratch volumes in subpool b. A tolerance of 8 means that ExLM considers the scratch volumes to be balanced if the number of scratch volumes for each subpool is within 8 volumes of that "perfect" balance.

Even if you do not specify `BALSCR`, ExLM will try to keep scratch volumes balanced through LSM selection for enters and ejects.

`NUMSCR`

specifies the scratch volume level for each LSM specified by the `ACSID` or `LSMID` keyword.

tg

Specifies the tape group. You can specify `NUMSCR` for multiple tape groups, but not multiple times for the same tape group.

Specify tape groups if you have multiple subpools or if you have specified the `MEDIA` keyword on a `SUBPOOL` statement. If you do not specify tape groups, `NUMSCR` applies to all tape groups. If you do not specify tape groups and `SUBPOOL` statements, `NUMSCR` applies to tape group `GENERAL`.

n

specifies the scratch volume level as a nonnegative integer.

`CMAXSCR`

specifies the conditional maximum scratch volumes across the LSMs specified by the `ACSID` or `LSMID` keyword. ExLM will demote or eject scratch volumes over the maximum as needed.

tg

Specifies the tape group. You can specify `CMAXSCR` for multiple tape groups, but not multiple times for the same tape group.

Specify tape groups if you have multiple subpools or if you have specified the `MEDIA` keyword on a `SUBPOOL` statement. If you do not specify tape groups, `CMAXSCR` applies to all tape groups. If you do not specify tape groups and `SUBPOOL` statements, `CMAXSCR` applies to tape group `GENERAL`.

n

specifies the conditional maximum scratch volumes as a nonnegative integer.

`AMAXSCR`

specifies the absolute maximum scratch volumes across the LSMs specified by the `ACSID` or `LSMID` keyword. ExLM will always demote or eject scratch volumes over the maximum.

tg

Specifies the tape group. You can specify `AMAXSCR` for multiple tape groups, but not multiple times for the same tape group.

Specify tape groups if you have multiple subpools or if you have specified the `MEDIA` keyword on a `SUBPOOL` statement. If you do not specify tape groups, `AMAXSCR` applies to all tape groups. If you do not specify tape groups and `SUBPOOL` statements, `AMAXSCR` applies to tape group `GENERAL`.

n

specifies the absolute maximum scratch volumes as a nonnegative integer.

Usage

Use the following guidelines for the `MANAGE PHYSICAL` statement:

- Use Format1 to manage an entire ACS as a unit. Use Format2 to individually manage one LSM, all LSMs in an ACS, or some subset of LSMs in an ACS. The criteria specified after an `LSMID` parameter and before any additional `LSMID` parameters apply only to the LSMs specified in that `LSMID` parameter.

- ExLM uses HSC `VOLATTR` statements to identify a volume's media type. StorageTek strongly recommends that you maintain identical VOLATTR statements on all hosts or unpredictable results can occur.

- The HSC parameter `CLNPFX` specifies a cleaning cartridge prefix. ExLM requires this prefix to identify volumes as cleaning cartridges.

- ExLM Cleaning cartridge management only ensures that you have sufficient cleaning cartridges in your LSMs and that their distribution is balanced across the LSMs. You must use HSC to specify the cleaning cartridge prefix and to specify how many times HSC mounts a cleaning cartridge before making it not usable.

- The `HSCUNSCR` requires you to specify the `OPTIONS SYNC` parameter to force ExLM to do HSC scratch synchronization; for more information, see "OPTIONS" on page 126.

Restrictions

Note the following restrictions for the `MANAGE PHYSICAL` statement:

- Do not specify more than one `MANAGE PHYSICAL` statement for a specific LSM.

- Specify `MANAGE PHYSICAL` statements after all `SUBPOOL` statements.

- In Format 2, LSM group hierarchies cannot span ACS boundaries.

- The `NEXT` keyword establishes hierarchies. Do *not* create cycles or loops among LSM groups.

- You cannot use the `MANAGE PHYSICAL` statement to manage VTVs or to specify VTV tape groups for scratch criteria. For more information on using the `MANAGE VIRTUAL` statement to manage VTVs, see "MANAGE VIRTUAL" on page 116.

- You cannot specify undefined tape groups on the `HSCUNSCR`, `DISTSCR`, `BALSCR`, `NUMSCR`, `CMAXSCR`, or `AMAXSCR` parameters. You cannot use these parameters to establish defaults for all tape groups that can then be overridden for a subset of tape groups.

- `NUMSCR` must be less than `CMAXSCR`, which must be less than `AMAXSCR`.

- Do not specify a `SUBPOOL` statement to cover cleaning cartridges because this disables ExLM cleaning cartridge management (including the `MANAGE BALCLN` and `NUMCLN` parameters).

Note that ExLM automatically defines the `Cleaning` subpool for cleaning cartridges, under which cleaning cartridge management is enabled. The cleaning `Cleaning` subpool contains the following tape groups:

- `Cleaning _Standard` - includes all standard cleaning cartridges known to ExLM and

- `Cleaning _Helical` - includes all helical cleaning cartridges known to ExLM.

You cannot specify these cleaning cartridge tape groups on the `HSCUNSCR`, `DISTSCR`, `BALSCR`, `NUMSCR`, `CMAXSCR`, or `AMAXSCR` keywords.

MANAGE VIRTUAL

The `MANAGE VIRTUAL` tells ExLM to manage VTVs.

Syntax

```
▶▶────MANAGE──────────────VIRTUAL───────;────────────────────────────────▶◀
```
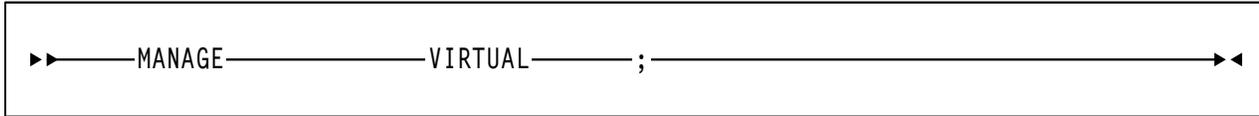
Figure 28. MANAGE VIRTUAL Statement Syntax

Parameters

None.

Usage

Use the `MANAGE VIRTUAL` statement to tell ExLM to manage VTVs.

If you specify the `MANAGE VIRTUAL` statement in a parameter file, you can assign methods to VTVs on any of the following statements:

- "DATASET" on page 98
- "LOCATION" on page 103
- "OPTIONS" on page 126 (`EXTERNAL` parameter)
- "SET METHOD" on page 147
- "SUBPOOL" on page 154

If you do not specify the `MANAGE VIRTUAL` statement in a parameter file, you cannot use ExLM to manage VTVs, but you can produce reports that include information about VSM resources.

METHOD

The `METHOD` statement defines an ExLM management method for nonscratch volumes. You can assign management methods to any nonscratch Nearline volume that resides in a managed LSM. Management attributes for physical tape volumes allow you to specify policies that control where tapes are stored, when they should be ejected, and in which order ExLM can choose tapes to move or eject during library content management. See "MANAGE PHYSICAL" on page 109 for information on identifying LSMs to be managed.

You can also assign management methods to any nonscratch VTV if the `MANAGE VIRTUAL` statement is specified. Management attributes for VTVs allow you to specify policies controlling for consolidations, migrations, recalls, exports, and so on. See "MANAGE VIRTUAL" on page 116 for more information.

See "Usage" on page 124 for information about assigning a method to a volume.

Syntax
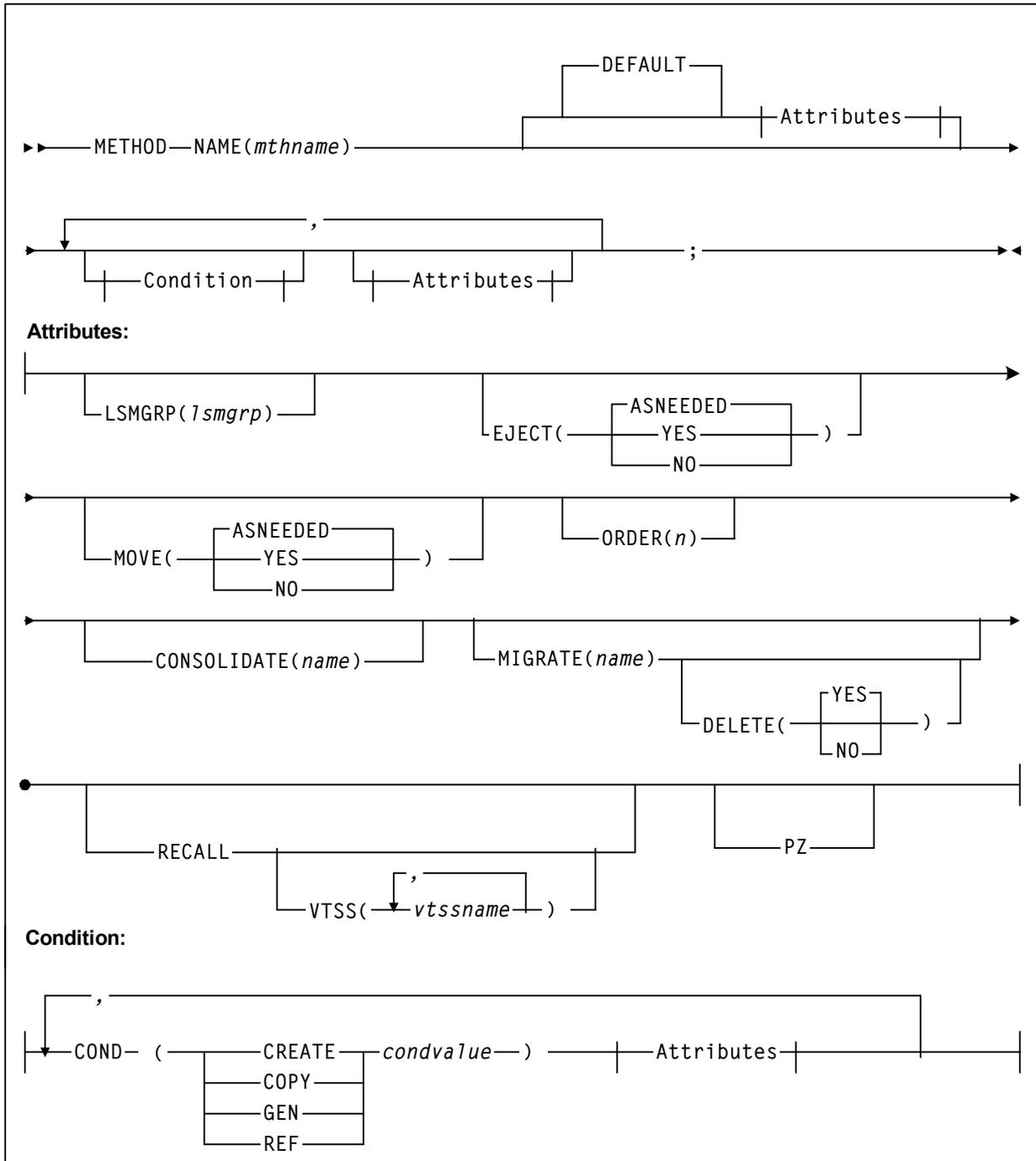
Figure 29. METHOD Statement Syntax

Parameters

Table 17 lists the valid abbreviations for the `METHOD` statement.

Table 17. METHOD Statement Abbreviations

Statement or Parameter	Abbreviation
METHOD	MTH
NAME	MTHNAME
EJECT	EJ
ASNEEDED	NEED
YES	Y
NO	N
ORDER	ORD
EQ	=
GE	>=
GT	>
LE	<=
LT	<
NE	¬=

`NAME`
>   specifies the method name.

>   ***mthname***
>>   the unique method name, which is 1 to 10 characters.

DEFAULT
>   specifies the default attributes to use for this management method.

>   The attributes specified here will be used for a volume when none of the specified conditions, if any, apply.

>   The attributes specified here do **not** change the default values for attributes of conditions.

`COND`
>   specifies the condition that assigns the associated attributes to the volume.

>   You can specify up to 255 conditions on a single `METHOD` statement. ExLM applies the attributes of the first `COND` parameter that evaluates as true. If no specified condition is true, ExLM assigns the method's default attributes.

CREATE
>   compare the number of days since the data set was created to the specified
>   value.
>
>   This value is equivalent to the `DaysSinceCreation` field of the `REPORT VOLUME`
>   and `SET METHOD` statements.

COPY
>   compare the copy number of the data set to the specified value. For generation
>   data sets, the copy number is the copy for a specific generation number.
>
>   1 denotes the most recently created copy of the data set (from TMS
>   information), 2 denotes to the next most recently created copy, and so on.
>
>   This value is equivalent to the `Copy` field of the REPORT VOLUME and SET
>   METHOD statements.

GEN
>   compare the generation of the data set to the specified value. If the data set on
>   the volume is not a generation data set, ExLM ignores the condition.
>
>   1 denotes the most current absolute generation number of the data set, 2 denotes
>   the next most current number, and so on.
>
>   ExLM uses the TMS tape catalog, not the MVS data set catalog facility, to
>   determine generation numbers.
>
>   This value is equivalent to the `Generation` field of the `REPORT VOLUME` and `SET
>   METHOD` statements.

REF
>   compare the number of days since the data set was last referenced to the
>   specified value.
>
>   This value is equivalent to the `DaysSinceReference` field of the `REPORT
>   VOLUME` statement. The `SET METHOD` statement does not have an exact
>   equivalent field for the `REF` option. However, you can specify
>   `DaysSinceReferenceTms` (RTDAYS) on the `WHEN` option of the `SET METHOD`
>   statement, which is similar to the `DaysSinceReference` field for volumes
>   defined to the TMS.

Logical Operators
specify the comparison between the keyword and the specified value.

>   EQ
>   equal to (=).
>
>   GE
>   greater than or equal to (>=).
>
>   GT
>   greater than (>).

`LE`
>> less than or equal to (<=).

`LT`
>> less than (<).

`NE`

>> not equal to (¬=).

value
> the value compared with the keyword specified for this condition. Valid values are 1 to 9999.

`LSMGRP`
> the name of the LSM group where volumes managed by this method should reside. If the volume is not currently in that LSM group, ExLM moves it to the LSM within that group that can best accommodate the volume. `LSMGRP` applies to *only* physical Nearline volumes, not VTVs.

> **lsmgrp**
>> the LSM group as specified on the `MANAGE PHYSICAL LSMGRP` parameter; for more information, see "MANAGE PHYSICAL" on page 109.

`EJECT`
> specifies when, if ever, ExLM ejects a volume managed by this method. `EJECT` applies to *only* physical Nearline volumes, not VTVs.

> `ASNEEDED`
>> Eject when free cells are needed (the default).

> `YES`
>> Always eject.

> `NO`
>> Never eject.

MOVE
> Specifies when, if ever, ExLM moves a volume managed by this method. Applies only to physical Nearline volumes, not to VTVs.

> `ASNEEDED`
>> Move this volume as needed to meet content management goals.

> `YES`
>> Always move this volume. Forces ExLM to move the volume even if it is only to another cell in the same LSM. This feature can be used, for example, to force the HSC to perform errant volume recovery on the volume.

> `NO`
>> Do not move this volume unless explicitly instructed to do so. Keeps ExLM from moving the volume for content management purposes.

Notes:

- If the `LSMGRP` parameter is also specified and the volume is not in the correct LSM group, ExLM will move the volume to the specified LSM group. This is considered an explicit move that overrides `MOVE(NO)`.

- Specifying `MOVE(NO)` does not in itself restrict ExLM from ejecting the volume if needed. Use the `EJECT(NO)` attribute to keep ExLM from ejecting the volume.

`ORDER`

Specifies the "pick order" ExLM uses to pick a volume managed by this method for either ejection or demotion. `ORDER` applies to *only* physical Nearline volumes, not VTVs.

ExLM ejects or demotes only the number of volumes required to create sufficient free cells. ExLM begins with `ORDER`(1) and continues through the highest specified order. Within an order, ExLM selects the least recently referenced volumes until all volumes of that order have been processed.

n

the pick order. Valid values are 1 to 100 and the default is 50.

`CONSOLIDATE`

consolidate VTVs managed by this method. `CONSOLIDATE` applies to *only* VTVs, not physical Nearline volumes. `MIGRATE`, `CONSOLIDATE`, and `RECALL` are mutually exclusive.

name

specifies the 1 to 8 character name of a group of consolidated VTVs.

If you specify the same group name on different methods or on different conditions within the same method, all VTVs with the same group name are consolidated on a common set of consolidation MVCs. Use different consolidation group names to segregate different VTV groups on separate sets of consolidation MVCs.

MIGRATE

Migrate VTVs managed by this method that do not already have a migration copy. `MIGRATE` *only* applies to VTVs, not Nearline physical volumes. `MIGRATE`, `CONSOLIDATE`, and `RECALL` are mutually exclusive.

DELETE

specifies whether to delete the VTVs from the VTSS after migration completes. You must specify `MIGRATE` before you specify `DELETE`.

`YES`

delete VTVs after migration completes (the default).

`NO`

do not delete VTVs after migration completes.

You cannot specify `DELETE` unless you first specify `MIGRATE`.

RECALL

Recall VTVs managed by this method that are not already VTSS-resident. `RECALL` *only* applies to VTVs, not Nearline physical volumes. `MIGRATE`, `CONSOLIDATE`, and `RECALL` are mutually exclusive.

`VTSS`

specifies where the VTVs are recalled as follows:

- If you do not specify a VTSS (the default), VTCS recalls the VTVs to the VTSS of creation unless this VTSS does not have sufficient space. In this case, VTCS recalls the VTVs to the VTSS with the most available space.

- If you specify a single VTSS, VTCS attempts to recall the VTVs to the specified VTSS unless this VTSS does not have sufficient space. In this case, VTCS recalls the VTVs to the VTSS with the most available space.

- If you specify a list of VTVs, VTCS attempts to recall the VTVs to the VTSS of creation if it is on the list, otherwise VTCS recalls the VTVs to the VTSS with the most available space on the list.

vtss-name
a VTSS name.

PZ

Specifies that volumes managed by this method should reside within the Performance Zone (PZ) of an SL8500 library. The PZ is a defined area of an LSM that is closest to the transports. Cartridges residing in this area have faster mount and dismount times.

Note: The PZ contains approximately 360 storage cells per LSM. Should more volumes than that number meet the criteria for the PZ, ExLM will position the additional volumes close to the PZ, but will not move non-PZ volumes to make space for PZ volumes. Parameters that select too many PZ volumes will defeat the purpose.

Usage

The `METHOD` statement only defines an ExLM management method. To assign a method to a volume, first define the method, then use any of the following statements:

- "DATASET" on page 98
- "LOCATION" on page 103
- "OPTIONS" on page 126
- "SET METHOD" on page 147
- "SUBPOOL" on page 154

An unexpired nonscratch volume (that is not being ignored) has its management method assigned by the *first* of the above statements (except `OPTIONS`) that covers the volume.If, for example, you want a volume's data set name to determine its management method, either specify a method on *only* a `DATASET` statement, or specify the `DATASET` statement in the parameter file before any other statements that assign methods (such as `LOCATION`).

You can use the `OPTIONS` statement to assign methods to the following types of volumes:

- Externally managed in the TMS (`EXTERNAL` parameter)
- Not defined in a TMS (`HSCONLY` parameter)
- Specifically managed by a Method file entry (`METHODFILE` parameter).

For more information, see "OPTIONS" on page 126.

You can use the `SET METHOD` statement to conditionally override the method assignment from *any* previous statement or option; for more information, see "SET METHOD" on page 147.

Also note that ExLM predefines several methods described in Table 18.

Table 18. ExLM Predefined Management Methods

Method Name	Parameter Values
Cleaning	`ExLM internal use only`
Eject	`eject(yes)`
MVC	`ejct(no) move(no)`
NeverEject	`eject(no)`
PickFirst	`eject(asneeded) order(1)`
PickLast	`eject(asneeded) order(100)`
Scratch	ExLM internal use only
Standard (default method)	`eject(asneeded) order(50)`

You can specify any of the methods described in Table 18 *except* for `Scratch` and `Cleaning`, which ExLM uses to manage scratch volumes and cleaning cartridges. ExLM also lists methods `Scratch` and `Cleaning` on reports. Do not define a method using the name of a predefined method!

Note: If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

OPTIONS

The OPTIONS statement defines global ExLM processing options.

Syntax

```
►►─OPTIONS──────────────────────────────────────────────────────────────►
           └─CHECK─┘    └─SCAN─┘        └─TITLE(text)─┘

                                                      ┌─SYNC───┐
►─────────────────────────────────────────────────────┬──────────────────►
   └─SUPAUTORPT(──────ALL──────────)─┘    └─NOTMS─┘   └─NOSYNC─┘
              └──┬──────────┬──┘
                 └←─rpt────←─┘

                        ┌─NOPAUSE─┐        ┌─ENTERPROMPT───┐
►──────────────────────────────────────────────────────────────────────►
   └─SYNCVTV(hours)─┘   └─PAUSE───┘        └─NOENTERPROMPT─┘

                              ┌─DEFAULT─┐          ┌─EJSEQ───┐
►─────────────────────────────────────────────────────────────────────►
   └─EXTERNAL(method──┬─────────┬──)─┘    └─NOEJSEQ─┘
                      └─UNCOND──┘

                         ┌─DEFAULT─┐
►──────────────────────────────────────────────────────────────────────►
   └─HSCONLY(method──┬─────────┬──────────────)─┘
                     └─UNCOND──┘  └─HSCUNSCR─┘

   ┌─NOEJBAD──────┐         ┌─PICKEJ───┐
►──┼──────────────┼──────────┼──────────┼──────────────────────────────►
   └─EJBAD─┐      │         └─NOPICKEJ─┘   └─PICKFLEX(percent)─┘
           └─(text)─┘

   ┌─NOPICKSCR─┐
►──┼───────────┼─────────────────────────────────────────────────────────►
   └─PICKSCR───┘        └─MINENTER(days)─┘      └─MINREF(days)─┘

►──────────────────────────────────────────────────────────────────────►
   └─CYCLESOON(days)─┘      └─IGNORE18TRKFLAG─┘    └─METHODFILE─┘

►──────────────────────────────────────────────────────────────────────►
   └─CLEARFROZENPANELS─┘ └─EJFILE─┘ └─CMAXEJ(count)─┘ └─AMAXEJ(count)─┘

                  ┌─,──────┐
►──────────────────────────────────────────────────────────────────────►
   └─EJCAP(──←─lsmid──←─)─┘  └─EJMSG(text)─┘  └─EJMULT(mult)─┘

              ┌─CLOSEST─┐                    ┌─SERIAL───┐
►──────────────────────────────────────────────────────────────────────►
   └─EJMODE(──┼─SINGLE──┼──)─┘    └─ECAP(──┼──────────┼──)─┘
             └─COLLATE─┘                    └─PARALLEL─┘

►──────────────────────────────────────────────────────────────────────►
   └─TRUEVALUE(text)─┘        └─FALSEVALUE(text)─┘

   ┌─NONSWAPPABLE─┐                       ┌─LCM1314W───┐
►──┼──────────────┼──────────────────────┼────────────┼──;─►◄
   └─SWAPPABLE────┘  └─WKUNIT(unit)─┘   └─NOLCM1314W─┘
```

Figure 30. OPTIONS Statement Syntax

Parameters

Table 19 lists the valid abbreviations for the `OPTIONS` statement.

Table 19. OPTIONS Statement Abbreviations

Statement or Parameter	Abbreviation
OPTIONS	OPT
ENTERPROMPT	ENPROMPT
NOENTERPROMPT	NOENPROMPT
MINENTER	MINENT
CELLCNT	CC
CLEARFROZENPANELS	CLRFZPNL
CONSOLIDATE	CONS
DATASET	DS
EJECT	EJ
NONSCRCNT	NSC
OPERATOR	OP
SCRCNT	SC
SUMMARY	SUM
SWAPPABLE	SWAP
NONSWAPPABLE	NONSWAP

`CHECK`
> specifies that ExLM:
>
> - Simulates managing LSMs and VSM as defined by the control statements in the parameter file used for this batch job, but does not consolidate, eject, or move volumes or modify the HSC CDS (including scratch synchronization).
>
> - Produces reports and creates the Eject File.
> Use `CHECK` to verify a parameter or configuration file and produce reports without having ExLM take actions.

`SCAN`
> specifies that ExLM scans control statement syntax and creates a Parameter File listing with any errors, but does not produce reports or perform any management action.
>
> If you specify `CHECK` and `SCAN`, ExLM operates in `SCAN` mode.

`TITLE`
> specifies a main title line to be printed in ExLM report headings. No title is printed if you do not specify a title.

title-line
the text of the title line, which is a maximum of 70 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

SUPAUTORPT
suppresses the following standard reports:

ALL
all reports *except* for the Enter Report.

CELLCNT

Cell Count Report.

CONSOLIDATE
Consolidation Report.

DATASET
Data Set Report.

EJECT
Eject Report.

EXPORT
Export Report.

NONSCRCNT
Nonscratch Count Report.

OPERATOR
Operator Report.

SCRCNT
Scratch Count Report.

SUMMARY
Summary Report.

Note: ExLM does not generate any standard reports if the parameter file does not include a MANAGE or ACTION statement.

NOTMS
specifies that ExLM runs without a TMS. When you specify NOTMS, ExLM:

- Does not try to locate ddname LCMTMSDB,

- Does not allow any TMS statements,

- Uses the last mounted date in the HSC CDS as the last referenced date, and

- Issues a message that ExLM is running without a TMS.

For more information, see "Running ExLM without a TMS" on page 139.

SYNC

instructs ExLM to synchronize the HSC scratch status of volumes in managed LSMs with that of the TMS.

`SYNC` applies to all non-ignored volumes in LSMs controlled by `MANAGE PHYSICAL` statements.

If the HSC scratch status for a volume does not match that of the TMS, ExLM updates the HSC scratch status to match. The TMS is **not** updated by this operation.

`SYNC` requires that ExLM be running with a TMS.

NOSYNC

instructs ExLM not to perform scratch status synchronization processing.

`SYNCVTV (`<u>`1`</u>` | hours)`

specifies that ExLM synchronizes HSC scratch status of VTVs with TMS scratch status.

hours

specifies the minimum number of hours since last reference that are required for a VTV before it is eligible for VTV scratch status synchronization. If the latest reference time for a VTV is within *hours*, ExLM will treat the volume as nonscratch, regardless of its TMS status. It will not be scratched. This "grace period" is intended to avoid potential data loss when DELSCR(YES) is in effect and ExLM receives TMS information that is slightly out of date. The range of hours is 0 to 99, where zero indicates no grace period.

The default value for *hours* is 1.

🛑 **Caution:** When you scratch a VTV with the HSC `MGMTclas` statement `DELSCR YES` attribute, VSM erases the VTV data at scratch synchronization time, which eliminates the ability to "unscratch" a VTV to recover data!

`PAUSE | NOPAUSE`

specifies whether ExLM pauses before starting actions. `PAUSE` specifies that ExLM issues console message `LCM4016E` and leaves it highlighted until the operator enters a `RESUME` command.

 Note: Scratch synchronization is **not** affected by `PAUSE`.

`ENTERPROMPT | NOENTERPROMPT`

specifies whether ExLM prompts the operator (via message `LCM4019A`) to enter volumes. The default (`ENTERPROMPT`) is to prompt the operator.

`EXTERNAL (method DEFAULT | UNCOND)`

specifies how ExLM manages nonscratch volumes defined as externally managed in the TMS as follows:

method

specifies the management method.

`DEFAULT`
> assign the specified method only if no other statement in the parameter file covers the same volume (the default).

`UNCOND`
> always assign the method indicates unless overridden by a `SET METHOD` statement or an entry in the method file with the 'U' indicator.

Hint: You can use `EXTERNAL` to assign a method to volumes controlled by DFHSM, but a `DATASET` statement specifying the prefix for migration and backup data sets is more flexible.

Note: If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

`HSCONLY`
> specifies how ExLM manages nonscratch volumes that are defined in the HSC CDS but not defined in a TMS as follows:

method
> specifies the management method.

`DEFAULT`
> assign the specified method only if no other statement in the parameter file covers the same volume (the default).

`UNCOND`
> always assign the method indicates unless overridden by a `SET METHOD` statement or an entry in the method file with the 'U' indicator.

`HSCUNSCR`
> mark volumes not in the TMS catalog as non-scratch in the HSC CDS.

Note: If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

For more information, see "Running ExLM without a TMS" on page 139.

`EJSEQ | NOEJSEQ`
> specifies whether HSC should honor the volume sequence presented by ExLM for ejects for SL8500 LSMs. The default is to honor the ExLM order (`EJSEQ`).

`NOEJBAD | EJBAD`
> specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (`NOEJBAD`).

Hint: You can also specify this parameter for a specific TMS on the `TMS` statement.

text

> specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`PICKEJ`|`NOPICKEJ`

> `PICKEJ` (the default) specifies that ExLM picks volumes for ejection whose management method specifies `EJECT(ASNEEDED)` and processes these volumes using the `ORDER` values.
>
> `NOPICKEJ` specifies that ExLM only ejects volumes whose management method specifies `EJECT(YES)`.

`PICKFLEX` (<u>10</u> | `percent`)

> specifies the amount of flexibility ExLM has when it picks volumes within an LSM group for demotion or ejection that have the same pick order.

percent

> determines the amount of flexibility, where:
>
> - 0 - no flexibility, ExLM always picks the least recently referenced volume.
> - 1 - 100, ExLM has increasing flexibility to pick a volume that has been referenced in the specified percentage of days less than the least recently referenced volume.

Hint: If you give ExLM some flexibility, it will tend to keep the content of your LSMs more balanced without requiring as much cartridge movement.

Note that because `PICKFLEX` is a percentage, the flexibility that ExLM has increases as the least recent reference days goes up. For example, with the default `PICKFLEX` of 10 percent, ExLM would have no flexibility if the least recently referenced volume was referenced in the last 1 to 9 days, 1 day flexibility if it was referenced in the last 10 to 19 days, 2 days flexibility if it was referenced in the last 20 to 29 days, and 10 days flexibility if it was referenced in the last 100 to 109 days.

`PICKSCR`|`NOPICKSCR`

> `PICKSCR` specifies that ExLM lists on the Enter Reports which non-LSM scratch volumes should be entered to replenish LSM scratch counts. `PICKSCR` applies for all LSMs ExLM manages during execution.
>
> **Note:** The media type for volumes not in an LSM is determined solely by HSC `VOLATTR` statements. If these `VOLATTR` statements do not correctly specify the media type of candidate scratch volumes, `PICKSCR` may select incorrect media types for scratch volume entry.
>
> `NOPICKSCR` (the default) specifies that ExLM does not list on the Enter Reports which non-LSM scratch volumes should be entered to replenish LSM scratch counts.

Specifying `NOPICKSCR` requires the operator to select scratch volumes for entry. `NOPICKSCR` applies for all LSMs ExLM manages during execution.

For both `PICKSCR` and `NOPICKSCR`, if more non-LSM scratch volumes need to be entered for a tape group than are defined to the TMS, the Scratch Count Report indicates this additional need for the tape group.

`MINENTER (`<u>`2`</u>` | days)`

specifies that ExLM does not eject volumes entered since the specified number of days. `MINENTER` does not apply to volumes whose assigned method specifies that they should always be ejected.

For multi-volume data sets whose volumes are processed as a unit, ExLM uses the most recent enter date of any volume in the set.

For volumes defined in a TMS, `MINENTER` applies to data sets on nonscratch volumes that were created before volume was entered. This prevents ExLM from ejecting a newly entered volume with data you wish to process. However, if the data on the volume was created after the volume was entered, `MINENTER` does not apply.

`MINENTER` applies to all HSC-only nonscratch volumes because no TMS is available to provide data set information for them.

days

days since the volume was entered. Valid values are 0 to 999. The default value is 2 days. A value of 0 means ExLM will eject volumes regardless of when they were entered.

`MINREF (`<u>`2`</u>` | days)`

specifies that ExLM does not eject volumes referenced since the specified number of days. `MINREF` does apply to volumes whose assigned method specifies that they should always be ejected.

For multi-volume data sets whose volumes are processed as a unit, ExLM uses the most recent reference date of any volume in the set.

days

days since the volume was referenced. Valid values are 0 to 999. The default value is 2 days. A value of 0 means ExLM will eject volumes regardless of when they were referenced.

CYCLESOON

specifies that ExLM does not eject volumes that expire (become scratch) within the interval specified by *days*. The CYCLESOON parameter:

- Requires the TMS to assign an expiration date to the volume.
- Does not apply to volumes with METHOD EJECT(YES).
- Applies to volumes in all LSMs that ExLM manages.

days

the expiration interval, in days. Valid values are 1 to 99 and there is no default.

IGNORE18TRKFLAG

specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

IGNORE18TRKFLAG also requires PICKSCR to cause ExLM to select scratch volumes for entry into managed LSMs. If you specify PICKSCR but not IGNORE18TRKFLAG, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for a specific TMS on the TMS statement.

METHODFILE

specifies that ExLM reads the method file specified by ddname LCMMTHIN. Each record in specifies a volser and the management method for that volume; for more information, see "METHODFILE Record" on page 380.

Volumes specified in the method file will only be assigned the specified method if they are:

- not expired,
- not being ignored,
- are nonscratch,
- are not cleaning cartridges, and
- reside in a managed LSM.

CLEARFROZENPANELS

specifies that ExLM removes volumes from frozen panels in managed LSMs. The HSC SET FREEZE utility marks panels frozen; for more information, see *HSC System Programmer's Guide*. ExLM uses moves and ejects as needed to remove all volumes from frozen panels in managed LSMs. CLEARFROZENPANELS does not apply to non-managed LSMs.

EJFILE

specifies that ExLM does take any actions other than scratch status updates and creates an Eject File (even if you specify the CHECK parameter).   For more information, see "The ExLM Eject File" on page 140.

CMAXEJ

specifies the conditional maximum number of ejects that ExLM can perform during this run. The conditional maximum specifies the total number of ejects, but only limits ejects chosen by ExLM to meet content management policies. Explicit eject specified by `ACTION EJECT` statements and by the method attribute `EJECT(YES)` are processed first. Then ExLM ejects volumes as needed to meet content management policies. If the total number of ejects exceeds the specified CMAXEJ value, ExLM stops ejecting volumes even if the content management policies are not satisfied.

ExLM stops ejects on a data set boundary, but will not exceed the specified value. Therefore, actual ejects can be slightly lower than the specified value.

ejects

the number of ejects, in volumes. Valid values are 1 to 999999 and there is no default.

AMAXEJ

specifies the absolute maximum number of ejects that ExLM can perform during this run. ExLM limits ejects to the specified value, regardless of how many volumes have been selected by `ACTION EJECT` statements or assigned methods with the `EJECT(YES)` attribute.

ExLM stops ejects on a data set boundary, but will not exceed the specified value. Therefore, actual ejects can be slightly less than the specified value.

ejects

the number of ejects, in volumes. Valid values are 1 to 999999 and there is no default.

EJCAP

specifies a list of one or more LSMs whose CAPs are used for cartridge ejections. If this list does not contain at least one LSM for each managed ACS, ExLM assumes that all LSMs in that ACS are available for use (which is also the default if you do not specify a value for EJCAP). `ACTION EJCAP` overrides this setting on the `OPTIONS` statement.

lsmid

the hexadecimal LSM ID (00:00' to FF:7F'). Note that you cannot specify individual CAPS within an LSM and ExLM will not use priority CAPs. You can, however, use the ExLM DISPLAY, PAUSE, REDIRECT, and RESUME commands to manage ExLM activity for specific CAPs; for more information, see:

EJMSG

specifies the text of the eject message (SLS1251E).

If you do not specify this parameter, ExLM uses a text of 'Action Stmt' followed by a number indicating which `ACTION` statement is controlling the ejects. For example, if the fourth `ACTION` statement is controlling the ejects, the ExLM job name is `EXLM`, and the CAP is 00:00, the following messages will be issued when the CAP door is unlocked:

```
SLS0259A CAP PROCESSING TERMINATED; EMPTY CAPID 00:00

SLS1251E CAPID 00:00 (EXLM): ACTION STMT 1
```

text

the message text, which is a maximum of 32 characters (longer strings are truncated to 32 characters). Enclose the character string in single quotes if it contains blanks or other special characters. For more information, see "Textual Data" on page 20.

Any of the fields in the "ACTION Statement Fields" section of *ExLM Quick Reference* can be specified in the text string by placing the ampersand character (''&'') before the field and a period (''.'') after the field. The period is optional if the character immediately following the field is not an alphanumeric or national character.

Hint: A new `EJMSG` is generated for each CAP break using the text you specify. For example, if you specify CAP break on location name, you can include &locationname. as part of your message text as follows:

EJMSG('Location &locationname.').

`EJMULT`

eject volumes in multiples specified by *mult*. For example, for `EJMULT`(10), ExLM ejects volumes in multiples of ten, which can include situations such as ejecting forty volumes at a time through an Enhanced CAP.

Hint: You can use `EJMULT` to force volume ejections in amounts that fit evenly into cases or magazines for transport. For example, to fill a 10-cell magazine evenly, specify `EJMULT`(10).

`EJMULT` has no effect on the selection of a CAP for eject processing. For example, specifying `EJMULT`(40) does not prevent ExLM from selecting a 21-cell CAP for ejection.

StorageTek recommends that you do **not** specify an `EJMULT` value that is larger than the capacity of the smallest CAP used. For example, if you specify `EJMULT(40)` and a 21-cell CAP is used for ejects, ExLM ejects volumes in batches of 40, which means

that the operator has to empty the CAP twice (21 volumes followed by 19 volumes) for each batch of 40 volumes.

StorageTek also recommends that you do **not** specify large values (such as 200) for EJMULT. PAUSE commands (without the IMMED operand) do not take effect for a specific CAP until the current batch has been ejected, so large EJMULT values increase the delay before PAUSE commands take effect. There is no impact on PAUSE commands that specify the IMMED operand. The EJMULT parameter is only valid if CAPs of multiple LSMs are included in the EJCAP list and are available. ACTION EJMULT overrides this setting on the OPTIONS statement.

mult
> the multiple that ExLM uses to eject volumes. Valid values are 1 to 500 inclusive and the default is 1.

ECAP(SERIAL | PARALLEL)
> specifies whether to use the doors of enhanced CAPs serially or in parallel.

SERIAL
> specifies that when ejecting through enhanced CAPs, ExLM first fills one door and then the next door, alternating as necessary to perform the ejects scheduled for an LSM. This ensures that volumes are ejected in the order indicated by the ExLM Eject Report. This is the default.

PARALLEL
> specifies that when using enhanced CAPs, ExLM uses both CAP doors to service ejects simultaneously, and schedules new eject batches as soon as a CAP door becomes available. Although ExLM will schedule ejects in the same order indicated by the ExLM Eject reports, some ejects may complete sooner than others.

TRUEVALUE
specifies the text to print for fields that have a Boolean value of TRUE.

text
> specifies the text, which is a maximum of 20 characters.   The default is ''YES''.

FALSEVALUE
specifies the text to print for fields that have a Boolean value of FALSE.

text

specifies the text, which is a maximum of 20 characters.   The default is ''NO''.

SWAPPABLE | NONSWAPPABLE
specifies whether ExLM is swappable when performing any planned actions on volumes. NONSWAPPABLE (the default) eliminates delays caused by ExLM swapping in and out.

`WKUNIT`

> specifies the DASD unit name to which ExLM should dynamically allocate work data sets.

> ### *unit-name*

>> the name of a generic or esoteric disk unit, which is a maximum of 8 characters, and cannot be enclosed in quotes. Ensure that the *unit-name* is a valid IBM-defined or installation-defined generic or esoteric disk unit. Do not code *unit-name* as the name of a virtual input/output (VIO) disk unit. For more information on generic and esoteric unit names, see the *JCL User's Guide* for your system.

>> The default value for *unit-name* is SYSALLDA.

LCM1314W | NOLCM1314W

> If a value in a comparison contains a character that might indicate you meant to specify MATCHES, message LCM1314W is issued. For example, the following comparison generates message LCM1314W:

> ```
> dsn eq 'sys2.backup.**'
> ```

> The text of this message is:

> ```
> LCM1314W This string is not considered a mask. If it is a mask, use the
> MATCHES condition. Specify OPTIONS NOLCM1314W to eliminate this warning.
> ```

> LCM1314W is the default. NOLCM1314W suppresses message LCM1314W.

Usage

You can use the OPTIONS statement to define global ExLM processing options. If you do not specify an OPTIONS statement in a parameter file, ExLM uses default values for all OPTIONS statement parameters that have defaults. You can only specify one OPTIONS statement in a parameter file.

As described in the descriptions of the individual parameters, you can override OPTIONS global settings on other statements. For example, you can use the TMS statement to override this global setting NOEJBAD | EJBAD on the OPTIONS statement.

For more information about using ExLM with your TMS, see Chapter 3, "Using ExLM with Your TMS" on page 41.

Running ExLM without a TMS

If you run ExLM without a TMS, specify the `OPTIONS NOTMS` and `HSCONLY` parameters and do *not* specify any of the following statements or statement parameters:

- `TMS`
- `DATASET`
- `LOCATION`
- A `METHOD` statement `COND` parameter indicating `CREATE`, `COPY`, or `GEN`
- Any of the following `OPTIONS` statement parameters:
  - `CYCLESOON`
  - `EJBAD`
  - ` EXTERNAL`
  - `IGNORE18TRKFLAG`
  - `PICKSCR`
  - `SYNC`
  - `SYNCVTV`
- `REPORT DATASET`
- A `REPORT VOLUME` statement field requiring TMS information
- A `SUBPOOL` statement `TMSNAME` parameter.
- `SET METHOD` statement conditions with fields that represent TMS information.

The ExLM Eject File

An Eject File contains records describing all volumes selected for ejection by the ExLM batch job that created the file. You cannot, however, use an Eject File as direct input to either the ExLM Eject Utility or the HSC SLUADMIN Eject Cartridge Utility. Instead, you must use a program that you provide to process the Eject File (including filtering the volume list) to construct valid input records for the ExLM Eject Utility or the HSC SLUADMIN Eject Cartridge Utility. For more information on the format of the input file to the ExLM Eject Utility, see "Eject Utility Input Data Set" on page 368.

To create an Eject File, you:

- Specify the `EJFILE` keyword; for more information, see "`EJFILE`" on page 134.

- Create a DD statement in the ExLM batch job; for more information, see "`LCMEJECT`" on page 32.

An eject file contains one record for each volume to be ejected. Table 20 describes the Eject File record format.

Table 20. ExLM Eject File Format

Starting Column	Ending Column	Field Description
1	6	Volser (left-justified and padded with trailing blanks if necessary.)
10	12	The LSM in which the volume resides ('00:00' to 'FF:7F')
16	23	Location name for cartridge (left-justified and padded with trailing blanks if necessary.)
27	31	Five-digit slot number padded with leading zeros or a blank field.
38	42	Five-digit volume sequence number padded with leading zeros; this field qualifies the volumes of a multiple volume data set (00000 denotes a scratch volume or an expired volume.)
46	51	Volser of first volume in a multi-volume data set (left justified and padded with trailing blanks when necessary), or blank when this volser is not available or for scratch volumes.
Note: All other columns must contain a blank character.		

Figure 31 shows an example of an ExLM Eject File.

```
101385 00:00 Library 00101 00001 101385
103244 00:00 Library 00119 00001 103244
104857 00:00 Library 00212 00001 104857
FZV581 00:00 Local 00001 FZV581
100898 00:00 Vault 2 00040 00001 100898
1QQ557 00:00 Vault 2 00043 00001 1QQ557
1QZ526 00:00 Vault 2 00044 00001 1QZ526
100101 00:00 ƀVMS 00001100101
100106 00:00ƀVMS00001100106
100439 00:00ƀLIB00001100439
MM0689 00:01Library00078 00001MM0689
MM1318 00:01Library00415 00001 MM1318
100443 00:01Vault 2 0000900001 100443
100624 00:01Vault 2 0008200002 100443
```

Figure 31. Eject File Format

As shown in Figure 31, Eject File records are written in ascending order by LSM id.

Note: In the example above, location names `ƀLIB` and `ƀVMS` each begin with a blank character: the blank is part of these location names.

Examples

Figure 32 shows the defaults for the OPTIONS statement.

```
Options

  Ecap(Serial)                     // Fill each Ecap door separately

  Ejmode(Closest)                  // Default Eject Mode

  Ejmult(1)                        // Default Eject Multiple

  Enterprompt                       // Operator WTOR for enters

  External(NeverEject Default)     // Marked external in TMS

  Hsconly(NeverEject)              // If tape in HSC CDS only

  Minenter(2)                       // Days since entered

  Minref(2)                    // Days since referenced

  NoEjbad// Do not eject tapes marked Bad

  NoPause                          // Start ejects without pause

  Pickej                           // Eject Volumes for Need

  Pickflex(10)                     // Pick flexibility percentage

  NoPickscr                        // Don't pick scratch volsers

  NonSwappable                     // Not swappable during ejects

  Sync                             // Sync scratch status

  Wkunit(SYSALLDA)                 // DASD name for work datasets

  ;                                // End of Options statement
```

Figure 32. OPTIONS Statement Defaults

To change some of the defaults, create an OPTIONS statement that specifies the changes only. The rest of the values are the defaults. For example, create the OPTIONS statement shown in Figure 33 or Figure 34 to change only selected values.

```
Options

 Check// Execute in CHECK mod

 Ecap(Parallel)// Fill each Ecap door in parallel

 Pause                            // Pause before starting ejects

 NoSync// Do not Sync scratch status

 ;                                // End of Options statement
```

Figure 33. OPTIONS Statement to Change Selected Values (Nearline Volumes)

```
Options

 Sync                             // Sync scratch status

 SyncVTV// Sync scratch status (virtual volumes)

 ;                                   // End of Options statement
```

Figure 34. OPTIONS Statement to Change Selected Values (Nearline Volumes and VTVs)

PULLLIST

The `PULLLIST` statement specifies a list of volumes that an operator must enter for an upcoming production run.

Syntax
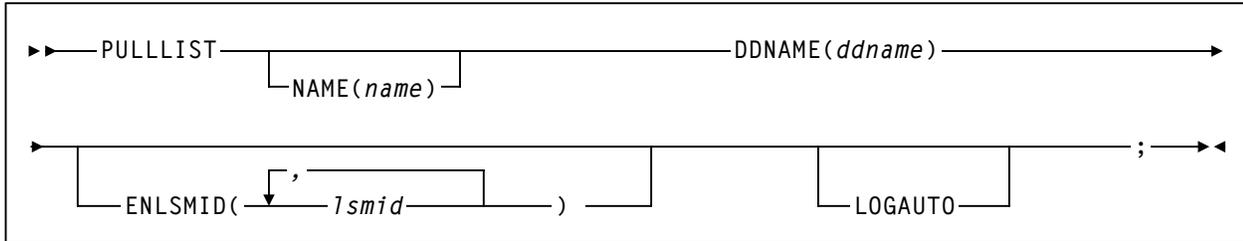
Figure 35. PULLLIST Statement Syntax

Parameters

Table 21 lists the valid abbreviations for the `PULLLIST` statement.

Table 21. PULLLIST Statement Abbreviations

Statement or Parameter	Abbreviation
PULLLIST	PULLIST,PLST
ENLSMID	ENLSM

`NAME`

   specifies the pull list name, which can be referenced by other statements in the ExLM parameter file.

   pulllist

      the pull list name.

   The default pull list name is `PULLLIST` followed by the number of the `PULLLIST` statement. For example, the default for the first `PULLLIST` statement is `PULLLIST1`.

`DDNAME`

   specifies the ddname of the file that contains the pull list.

   ddname

      specifies the ddname of the JCL DD statement that is allocated to the sequential file containing the pull list. The default value for ddname is `LCMPULL`.

`ENLSMID`

   specifies the LSMs that will provide cells to enter the volumes on the pull list. ExLM ensures that the required number of free cells are available.   The default `ENLSMID` list for a specific `PULLLIST` statement includes all LSMs at the top of the LSM group hierarchy or hierarchies for all ACSs being managed.

   lsmid

      a hexadecimal LSM ID (x' 00:00' to x'FF:7F').

`LOGINLSM`

   specifies that ExLM writes an informational message to the log for each nonscratch volume on a pull list already in an LSM (managed or unmanaged).

Note: `LOGINLSM` is synonym for `LOGAUTO`, which is designed to replace `LOGINLSM`.

`LOGAUTO`

   specifies that ExLM writes an informational message to the log for each nonscratch volume on a pull list already in automated tape storage, which includes physical volumes in an LSM and VTVs in a VTSS.

Usage

Use the following guidelines to create `PULLLIST` statements:

- You can specify an unlimited number of `PULLLIST` statements in a parameter file. ExLM checks multiple statements in their order in a parameter file for volume information.

- If a volume is defined in multiple pull lists, it will be associated with the first pull list that defines it. Subsequent occurrences of the volume in the same pull list or in other pull lists are ignored and a message is issued to the log for each occurrence.

- Pull lists can contain only nonscratch volumes (not scratch volumes or cleaning cartridges).

- If a volume on a pull list is already in a managed LSM, ExLM issues an informational message if you specified the `PULLLIST LOGINLSM` parameter. ExLM will not eject these volumes but can demote them.

- Volumes on a pull list take precedence over free cell and scratch criteria when determining how to manage an LSM. All free cells available are used to enter the volumes on the pull list.

- Volumes on a pull list are distributed between the LSMs on the `ENLSMID` parameter (or the default list if `ENLSMID` is not specified) in an even spread while filling up each CAP. For example, if the following scenario applies: LSM 00:00, cap size 80; LSM 001, cap size 21; 100 valid volumes on Pull List. LSM 00:00 would have 80 on the enter list and LSM 00:01 would have 20 on the enter list.

  If you have specified `ENLSMID`s from multiple ACSs, it is possible to separate multi-volume data sets between ACSs. Volumes are sorted by Location Code, Slot, Serial number order and placed in LSMs in the same order specified on the `ENLSMID` parameter.

- VTVs can be included on pull lists, which is useful if you want to pre-stage VTVs for a specific job or batch processing window.

SET METHOD

The `SET METHOD` statement conditionally assigns management methods to unexpired nonscratch volumes and nonscratch volumes managed by the `NOEXPIRECHECK` keyword.

Syntax
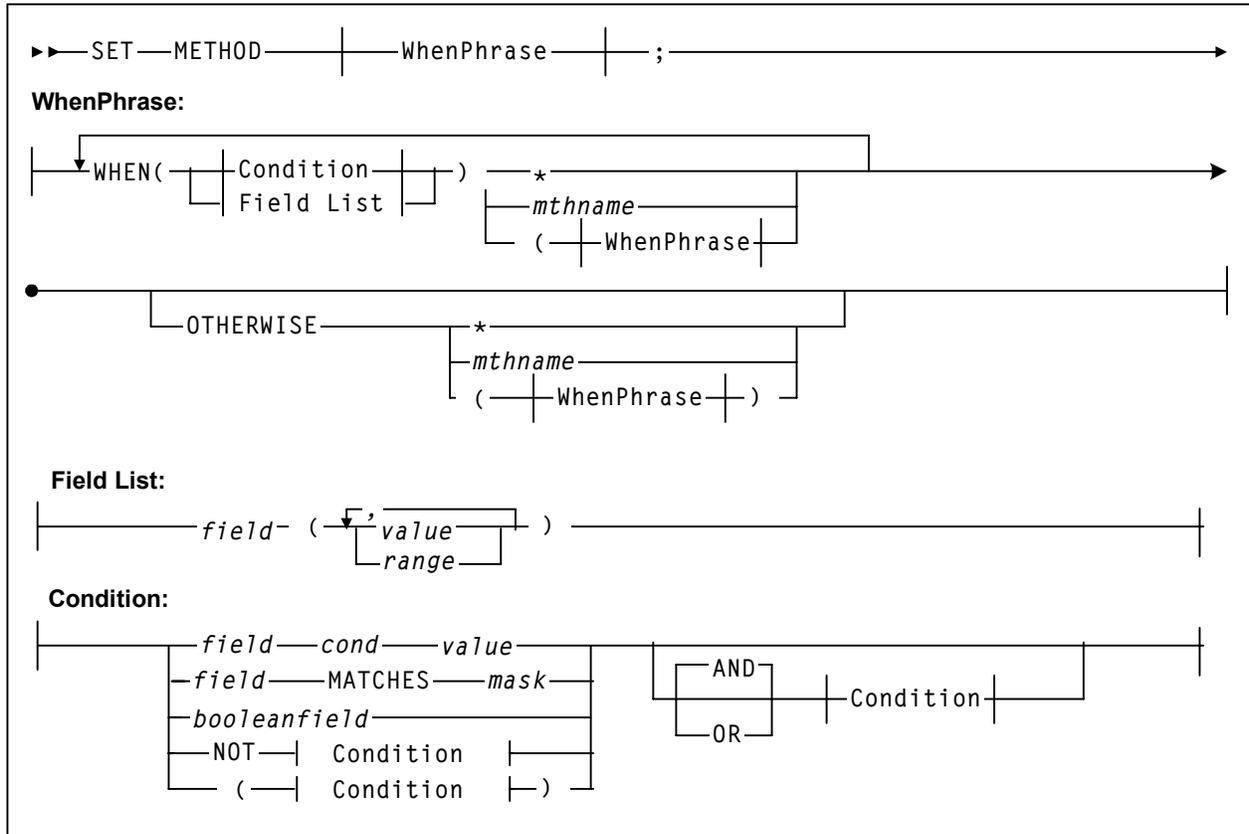
Figure 36. SET METHOD Statement Syntax

Parameters

Table 22 lists the valid abbreviations for the `SET METHOD` statement.

Table 22. SET METHOD Statement Abbreviations

Statement or Parameter	Abbreviation
METHOD	MTH
EQ	=
GE	>=
GT	>
LE	<=
LT	<
NE	¬=
NOT	¬
AND	&
OR	|

WHEN(`condition`**)**

begins a WHEN phrase followed by a field list or condition and method that applies to the volumes that meet the condition.

You can specify an unlimited number of `WHEN` phrases; the minimum is one. ExLM selects the first condition that covers a volume.

You can specify a WHEN condition that specifies * instead of *mthname* to exclude some volumes from processing by the `SET METHOD` statement

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided

values or *ranges*. The valid *values* depend on the type of *field* as described in Table 23.

Table 23. Valid Types of Fields

Type	Values and Examples
Boolean	Specify TRUE or FALSE. FALSE is less than TRUE in comparisons.
Character	Specify a string in single quotes. For example: '*string*'
Date	Specify a date constant or MISSING. Date constants are of the form '*date*'D or '*date*'d where *date* can be specified in any date format defined in the "SET METHOD Statement WHEN Fields" section of *ExLM Quick Reference* except TEXTDAYDATE. You must follow the format exactly. For example: '05Sep93'd is valid but '5Sep93'd is not.
Integer	Specify a number or MISSING. For example: 123
Time	Specify a time constant or MISSING. Time constants are of the form '*time*'T where *time* can be specified in any time format defined in the "SET METHOD Statement WHEN Fields" section of *ExLM Quick Reference*. You must follow the format exactly. For example: '12:30't is valid but '12;30't is not.

MISSING can also be specified as a period ('''.''). MISSING is less than all other values.

Table 24. Valid Formats for Date Fields

Type	Size	Example
yyddd	5	97248
ccyyddd	7	1997248
yy.ddd	6	97.248
ccyy.ddd	8	1997.248
mm/dd/yy	8	09/05/97
mm/dd/ccyy	10	09/05/1997
yy-mm-dd	8	93-09-05
yyyy-mm-dd	10	2000-09-05 This is the default.
dd_mmm_yy	9	09 Sep 98
dd_mmm_ccyy	11	09 Sep 2000
ddmmmyy	7	09Sep98

Table 24. Valid Formats for Date Fields

Type	Size	Example
ddmmmccyy	9	09Sep1997
textdate	18	September 9, 2000
textdaydate	29	Wednesday, September 10, 2000

Table 25. Valid Formats for Time Fields

Type	Size	Example
hh:mm	5	22:21 This is the default.
hh:mm:ss	8	22:21:32
hh:mm:ss_pm	11	10:21:32 PM

Condition
specifies a condition for volume selection.

field cond value
specifies a field, a condition, and a value to compare with one of the following conditions:

EQ
equal to.

NE
not equal to.

GE
greater than or equal to.

GT
greater than.

LE
less than or equal to.

LT
less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*
specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME, BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

  "**" matches one or more data set qualifiers.

  "*" matches one or more characters within a qualifier.

  "%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "*" matches one or more characters.

  "%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true. For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

*

do not assign a method to volumes covered by this `WHEN` condition.

mthname

assign the specified method to volumes covered by this `WHEN` condition.

`OTHERWISE`

selects all eligible volumes not selected by the `WHEN` conditions and optionally assigns a management method to them.

*

do not assign a method to volumes covered by the `OTHERWISE` condition.

mthname

assign the specified method to volumes covered by the `OTHERWISE` condition.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

Usage

Use the `SET METHOD` statement to conditionally assign management methods to unexpired nonscratch volumes and nonscratch volumes managed by the `NOEXPIRECHECK` keyword. The `SET METHOD` statement is valid for any volume in a managed LSM that is not being ignored or managed as a scratch or cleaning cartridge.

For more information about specifying global options and methods, see "OPTIONS" on page 126 and "METHOD" on page 117.

Note: If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple Volume Cartridges (MVCs) is `MVC`. The default method for all other volumes is `STANDARD`.

Examples

The most commonly used form of a condition compares one volume *field* with a *value*. For example, to select only volumes with a generation number higher than 4, specify the following:

```
WHEN(GENERATION GT 4)
```

All other volumes (non-gdgs and gdgs with a generation lower than or equal to 4) will not be selected for processing.

You can also use the AND keyword to select only volumes that are both in subpool TEST and have generation numbers greater than 4:

```
WHEN(SUBPOOL EQ 'TEST' AND GENERATION GT 4)
```

AND keywords are processed before OR keywords. For example, the following condition specifies that for a volume to be selected, it must either be in subpool TEST1 or it must be both in subpool TEST2 and have a generation number greater than 4:

```
WHEN(SUBPOOL EQ 'TEST1' OR SUBPOOL EQ 'TEST2' AND
GENERATION GT 4)
```

In general, the AND keyword is used to reduce the set of volumes selected and the OR keyword is used to expand the set of volumes selected.

You can also use Boolean fields to reduce the set of volumes selected. For example:

```
WHEN(GDG AND JOBNAME MATCHES 'PRODØ')
```

is equal to:

```
WHEN(GDG EQ TRUE AND JOBNAME MATCHES 'PRODØ')
```

You can use the SET METHOD statement to replace predefined methods. For example, Figure 37 shows a SET METHOD statement to replace the STANDARD predefined method.

```
set method

  when(method='STANDARD') /* Use method AgeMedium for volumes */

     AgeMedium; /* that would otherwise have been */
```

Figure 37. SET METHOD Example: Replacing a Predefined Management Method

SET METHOD Statement WHEN Fields

For more information, see the "SET METHOD Statement WHEN Fields" section of *ExLM Quick Reference.*

SUBPOOL

The SUBPOOL statement defines a volume subpool that you can use to qualify scratch criteria specified on the MANAGE PHYSICAL statement. The SUBPOOL statement can also specify the TMS that manages the volumes in the subpool (or IGNORE for TMS-managed volumes not available to ExLM). You can also use the SUBPOOL statement to specify a management method for nonscratch volumes in the subpool.

Syntax
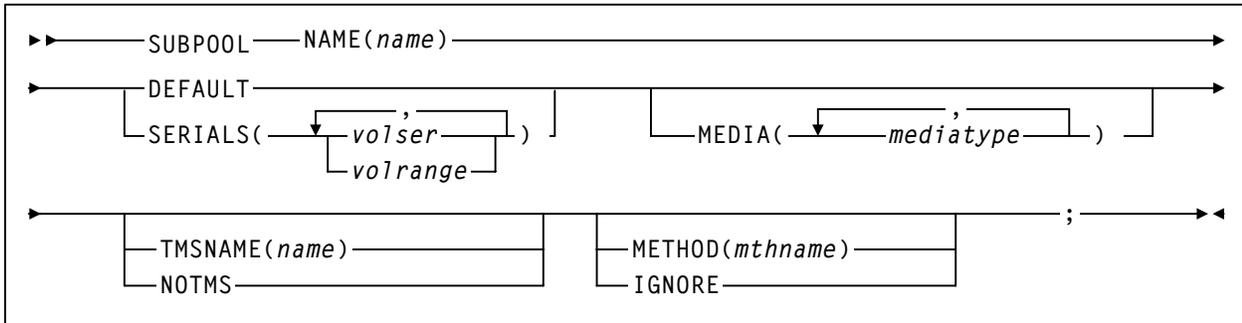
Figure 38. SUBPOOL Statement Syntax

Parameters

Table 26 lists the valid abbreviations for the `SUBPOOL` statement.

Table 26. SUBPOOL Statement Abbreviations

Statement or Parameter	Abbreviation
SUBPOOL	SP
NAME	SPNAME
SERIALS	RANGE
METHOD	MTH
STANDARD	S, ST, STA, STAN, CST MEDIA1, STD, 1, 3480
LONG	L, LO, LON, ECART, E, ECCST, ETAPE, MEDIA2, 3490E
DD3A	A
DD3B	B
DD3C	C
ZCART	Z

NAME

specifies the name of the tape subpool, which is a maximum of 16 characters. Do not specify `GENERAL`, which is the reserved name of the default subpool. You can, however, specify a different name for the default subpool. Do not specify the same subpool name for more than one `SUBPOOL` statement in the same parameter file.

subpool

the name of the tape subpool.

DEFAULT

specifies this subpool is the default subpool, which covers all volumes that are not covered by another `SUBPOOL` statement. You can only specify one default subpool. If you do not define a default subpool, ExLM automatically defines one with the name `GENERAL`.

The `DEFAULT` and `SERIALS` keywords are mutually exclusive.

SERIALS

specifies the volsers for the volumes in the tape subpool.

The `DEFAULT` and `SERIALS` keywords are mutually exclusive.

volser

a single volser. For more information, see "volser number" on page 24.

volrange
> a range of consecutive volsers. For more information, see "volser range" on page 24.

Use one or more blanks to separate the elements in a list of *volsers* or *volranges*. You can specify *volsers* and *volranges* in any order.

Any number of volumes can be covered by `SUBPOOL` statements. However, the total number of *volser* and *volrange* elements is a maximum of 1000 for all `SUBPOOL` statement, combined.

Do not specify:

- The same *volser* or *volrange* more than once for the same `SUBPOOL` statement or for more than one `SUBPOOL` statement in the same parameter file.

- Overlapping *volranges* or a volser that overlaps with a *volrange*.

`MEDIA`
> Specifies one or more of the media types managed as separate tape groups within the subpool:

`STANDARD`
> Standard length 3480 cartridge. It can be used on any 4480 or 4490 transport. If written in 36 track mode on a 4490 transport, the data cannot be read by a 18 track 4480 transport.

`LONG`
> 3490E enhanced capacity (ECART) cartridge. It can be used only on 36 track transports (4490 or 9490) and can be visually identified by the two tone colored case.

`DD3A`
> 10 Gb capacity helical cartridge.

`DD3B`
> 25 Gb capacity helical cartridge.

`DD3C`
> 50 Gb capacity helical cartridge.

`VIRTUAL`
> virtual tape volumes (VTVs) created by VSM.

`STK1R`
> 250 Gb capacity 9840 cartridge.

`STK2`
> any 9940 cartridge.

`STK2P`
> 60 Gb capacity 9940 cartridge.

ZCART
    3490EE cartridge (ZCART), which can only be used in a 9490EE transport.

If you do not specify MEDIA, ExLM does not manage the subpool by media type, and creates one tape group that includes all volumes in the subpool. The name of the single tape group is the same as the name of the subpool. For example, the subpool statement

  SUBPOOL NAME(A) SERIALS(000000-999999);

creates only tape group A, which is a tape group including all volumes in subpool A.

If you specify MEDIA, ExLM creates one tape group for each of the specified media types. The name of each such tape group is the name of the subpool followed by an underscore and the name of the media type. ExLM creates the subpool_OTHER tape group for all volumes in the subpool that do not have one of the specified media types.

You can specify these tape groups on the MANAGE PHYSICAL statement when qualifying scratch criteria. These tape groups will also appear in the standard scratch and nonscratch volume reports.

TMSNAME
    specifies the name of the TMS that contains information for volumes in this subpool.

    tmsname
        the TMS name as specified on the TMS NAME parameter for the TMS.

NOTMS
    do not use TMS information for the subpool because the TMS information is not valid.

METHOD
    the method to manage nonscratch volumes covered by this SUBPOOL statement. The specified method applies if no previous statement in the parameter file covers the same volume and specifies a method. This method can be overridden by the EXTERNAL, HSCONLY, and METHODFILE options of the OPTIONS statement and the SET METHOD statement and may be influenced by the OPTIONS statement CYCLESOON, MINENTER, and MINREF options. For more information, see "OPTIONS" on page 126 and "METHOD" on page 117.

    Note: If no statement assigns a method to a volume, ExLM will assign a default method to the volume. The default method for Multiple MVCs is MVC. The default method for all other volumes is STANDARD.

IGNORE
    ignore TMS information for all volumes in the subpool, assign them a method of NEVEREJECT, do not do scratch synchronization, and report scratch status per the HSC CDS. ExLM generates reports for these volumes. LOCATION statements, DATASET statements, SET METHOD statements, and method file entries do not affect

volumes in volumes in subpools defined with a `NOTMS` or `IGNORE` keyword. You can use this parameter for volumes controlled by TMSs not defined to ExLM.

Usage

Use the following guidelines to define subpools:

- You can specify a maximum of 255 `SUBPOOL` statements in a parameter file.

- Volumes not covered by a `SUBPOOL` statement are assigned to either the automatically created `GENERAL` default subpool or the name of a default subpool that you specify.

- All `SUBPOOL` statements in a parameter file must precede the first `MANAGE PHYSICAL` statement in the same file.

- The total number of *volser* and *volrange* elements for all `SUBPOOL` statements combined cannot exceed 1000.

- The keyword used to specify media type will be used to form a tape group name. The length of the tape group name cannot exceed 25 characters. Therefore, the combined length of the subpool name, the media type keyword, and the underscore cannot exceed 25 characters.

- ExLM uses the HSC `VOLATTR` statements in effect to identify the media type of a volume. To access to the `VOLATTR` statements currently in effect, ExLM requires the HSC programmatic interface function `QDSN`. See the *ExLM Installation Guide* for information about the required HSC software levels.

- StorageTek recommends that the HSC programmatic interface function `QDSN` be available and that all `VOLATTR` statements be identical on all hosts. If a volume does not have a media type defined by the HSC and is not covered by any HSC `VOLATTR` statements (or the `QDSN` function is not available), ExLM does not assign a media type to the volume.

- If a `SUBPOOL` statement covers cleaning cartridges, or specifies a name of `CLEANING`, cleaning cartridge management is disabled. ExLM issues an informational message and the keywords `BALCLN` and `NUMCLN` are not valid on any `MANAGE PHYSICAL` statement.

- You cannot specify tape groups created for VTVs for scratch criteria on the `MANAGE PHYSICAL` statement.

For more information about using tape subpools with your TMS, see:

Examples

Volsers Only

Figure 39 shows an example of an SUBPOOL statement that defines a subpool by volsers only.

```
$ubpool

 Name(Atape)                   // Subpool Name

 Serials(A00000-A99999)     // Serial number ranges

 ;                             // End of Subpool statement
```

Figure 39. SUBPOOL Statement: Define Subpool by Volsers Only

Volsers and Media Type

Figure 40 shows an example of an SUBPOOL statement that defines a subpool by volsers and media types.

```
$ubpool

 Name(Atape)                   // Subpool Name

 Serials(A00000-A99999)     // Serial number ranges

 Media(Long STK1R)// Media types for this subpool

 ;                             // End of Subpool statement
```

Figure 40. SUBPOOL Statement: Define Subpool by Volsers and Media Types

Ignore Subpool

Figure 41 shows an example of an `SUBPOOL` statement that specifies that ExLM ignores the defined subpool.

```
$ubpool

  Name(Atape)                      // Subpool Name

  Serials(A00000-A99999)      // Serial number ranges

  Ignore// Ignore TMS and take no actions

  Media(Long STK1R)// Media types for this subpool

  ;                            // End of Subpool statement

```

Figure 41. SUBPOOL Statement: Ignore Defined Subpool

Hint: To set ignore on in ExLM Explorer, click on the **No Tape Management System** option and the **Do Not Take Actions** option below it.

Assign Method NEVEREJECT to Subpool

Figure 42 shows an example of a `SUBPOOL` statement that assigns method `NEVEREJECT` to a subpool.

```
Subpool

  Name(Atape)                      // Subpool Name

  Serials(A00000-A99999)      // Serial number ranges

  Media(Long STK1R)// Media types for this subpool

  Method(NeverEject)// Do not eject nonscratch volumes

  ;                            // End of Subpool statement
```

Figure 42. SUBPOOL Statement: Assign Method NEVEREJECT

Unconditionally Assign Method NEVEREJECT to Subpool

Figure 43 shows an example of a parameter file that unconditionally assigns method NEVEREJECT to a subpool.

```
Subpool

  Name(Atape)                    // Subpool Name

  Serials(A00000-A99999)      // Serial number ranges

  Media(Long STK1R)// Media types for this subpool

  ;                        // End of Subpool statement
Set Method// Unconditionally assign method NeverEject
//  to Atape nonscratch volumes.
  When(                        // Start When condition

  ( Subpool EQ 'Atape')        // Subpool Equals 'Atape'

  )                            // End When Condition

  NeverEject                   // Method if condition met

  ;                            // End of Set Method statement
```

Figure 43. SUBPOOL Statement: Unconditionally Assign Method NEVEREJECT

Hint: You can use the SET METHOD statement to separate the assignment of a method from the subpool definition. For example, SUBPOOL statements in an ExLM Explorer configuration file are used by multiple runs. You can use the **Advanced** tab in Explorer to unconditionally assign methods.

TMS CA1

The `TMS CA1` statement defines CA-1 to ExLM and selects processing options for CA-1.

Syntax

Figure 44. TMS CA1 Statement Syntax

Parameters

Table 27 lists the valid abbreviations for the `TMS CA1` statement.

Table 27. TMS CA1 Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK
NOCLEANCHECK	NOCLNCHK
CLEANCHECK	CLNCHK

`NAME`

specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

tmsname

the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`TMCDSN`

specifies the DSname of the CA-1 tape management catalog (TMC).

You can specify `TMCDSN` or `TMCDD` but not both. If you specify `AGENT`, you must also specify `TMCDSN`.

dsname

the DSname of the CA-1 TMC.

`TMCDD`**N**

specifies the ddname of the CA-1 TMS catalog.

You can specify `TMCDDN` or `TMCDSN` but not both.

ddname

The ddname of the JCL DD statement for the CA-1 TMC. The default is `LCMTMSDB`.

`AGENT`

specifies that ExLM accesses information for the specified TMS from an ExLM Agent running on the specified host using the specified port.

If you specify `AGENT`, you must also specify `TMCDSN`.

host

    specifies the host where ExLM Agent is running. You can specify an IP address or a host name.

port

    specifies the port number of the ExLM Agent. If *port* is not specified, the default is 3002.

NOCLEANCHECK | CLEANCHECK

    specifies whether ExLM should treat scratch volumes that have the TMCLEAN flag on as defective.

Note: The TMBADTAP flag also causes ExLM to treat a volume as defective even if this parameter is not specified. When this parameter is in effect, the TMBADTAP flag in the TMS is the only source of information used in classifying a volume as defective.

NODELETECHECK | DELETECHECK

    specifies whether ExLM discards information for volumes marked "in delete status" in the TMS. When you specify NODELETECHECK, ExLM retains residual volume information for all volumes, including those marked "in delete status".
This residual information consists of data set, reference date, creation date, job name, and so forth.

    DELETECHECK specifies that ExLM discards information for volumes marked "in delete status" in the TMS.

NOEXPIRECHECK | EXPIRECHECK

    specifies whether ExLM ignores expiration information in the TMS and treats the volume as a nonscratch volume. When you specify NOEXPIRECHECK, you can use the residual data in the TMS catalog that contains the data set name and location code of the volume.

    EXPIRECHECK specifies that ExLM should treat volumes that are marked expired in the TMS as expired volumes. ExLM treats expired volumes as CYCLESOON volumes; for more information, see "CYCLESOON" on page 134.

NOEJBAD | EJBAD

    specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (NOEJBAD).

You can also specify this parameter for all TMSs on the OPTIONS statement.

text

    specifies the text of message SLS1251E that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for all TMSs on the `OPTIONS` statement.

Usage

For more information, see "Using ExLM with CA-1" on page 44.

TMS COMMON

The `TMS COMMON` statement defines and selects processing options for a TMS that uses the ExLM Common TMS interface.

Syntax
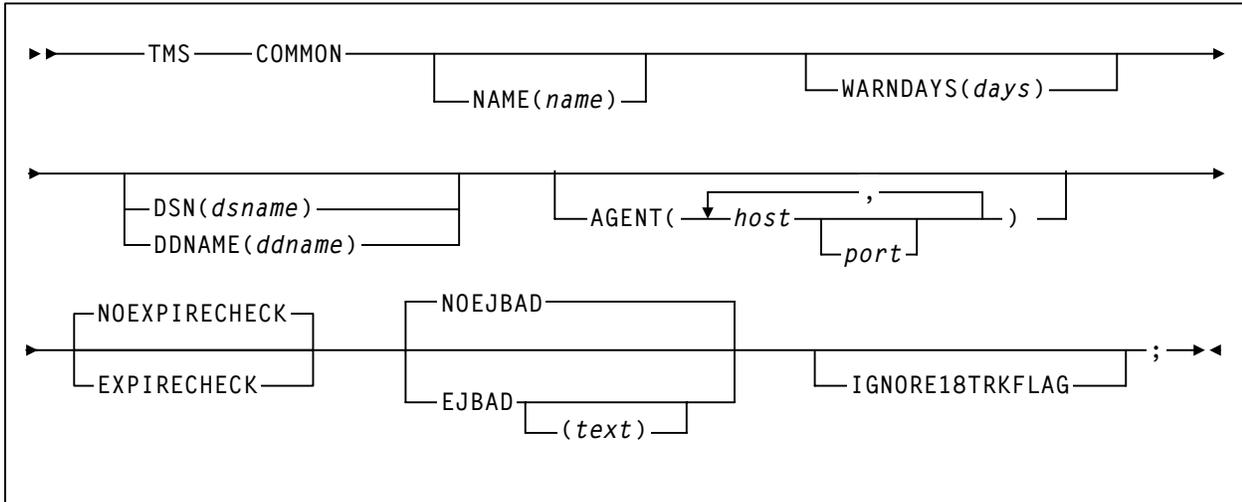
Figure 45. TMS COMMON Statement Syntax

Parameters

Table 28 lists the valid abbreviations for the `TMS COMMON` statement.

Table 28. TMS COMMON Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK

`NAME`

specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

tmsname

the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`WARNDAYS`

specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.

`1`| *days*

the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

`DSN`

specifies the DSname of the Common Interface TMS's tape management catalog (TMC).

You can specify `DSN` or `DDNAME` but not both. If you specify `AGENT`, you must also specify `DSN`.

dsname

the DSname of the TMS catalog. The file referenced by *dsname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume.

`DDNAME`

specifies the ddname of the TMS catalog.

You can specify `DDNAME` or `DSN` but not both.

ddname

The ddname of the JCL DD statement for the Common Interface's TMS catalog. The file referenced by *ddname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume. The default is `LCMTMSDB`.

`AGENT`

specifies that ExLM accesses information for the specified TMS from an ExLM Agent running on the specified host using the specified port.

If you specify `AGENT`, you must also specify `DSN`.

host

specifies the host where ExLM Agent is running. You can specify an IP address or a host name.

port

specifies the port number of the ExLM Agent. If *port* is not specified, the default is 3002.

`NOEXPIRECHECK` | `EXPIRECHECK`

specifies whether ExLM ignores expiration information in the TMS and treats the volume as a nonscratch volume. When you specify `NOEXPIRECHECK`, you can use the residual data in the TMS catalog that contains the data set name and location code of the volume.

`EXPIRECHECK` specifies that ExLM should treat volumes that are marked expired in the TMS as expired volumes. ExLM treats expired volumes as `CYCLESOON` volumes; for more information, see "`CYCLESOON`" on page 134.

`NOEJBAD` | `EJBAD`

specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (`NOEJBAD`).

You can also specify this parameter for all TMSs on the `OPTIONS` statement.

text

specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
> specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

> If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

> **Hint:** You can also specify this parameter for all TMSs on the `OPTIONS` statement.

Usage

The `TMS COMMON` statement defines and selects processing options for a TMS that uses the ExLM Common TMS interface. An installation written or vendor supplied program must be used to create a sequential file containing TMCI records. For more information, see "TMCI Record" on page 373.

Hint: Although ExLM supports using the Common TMS Interface through an ExLM Agent, this may not be a practical solution. Because Common TMS Interface requires that an installation or vendor supplied program generate the file for input, this file must be created on the agent host before running ExLM. It is your responsibility to insure that these files are created in advance and kept up-to-date for use by the ExLM Agent.

TMS CTT

The `TMS CTT` statement defines Control-T to ExLM and selects processing options for Control-T.

Syntax

```
►►──TMS────CTT────────────────────────────────────────────────►
                   └─NAME(tmsname)─┘

                                  ┌─NOEXPIRECHECK─┐
►──────────────────────────────────┤               ├────────────►
     ┌─NOEJBAD──────────────┐       └─EXPIRECHECK──┘
     ├──────────────────────┤
     └─EJBAD──┬──────────┬──┘
              └─(text)───┘

►─────────────────────────────────────────────────────────────►
     └─IGNORE18TRKFLAG─┘        ┌─DSN(dsname)──────┐
                                └─DDNAME(ddname)───┘

                                                             ;
►───────────────────────────────────────────────────────────►◄
     └─AGENT(──┬─host──┬─────┬──)──┘   └─WARNDAYS(days)─┘
                       │  ,  │
                       └─port─┘
```
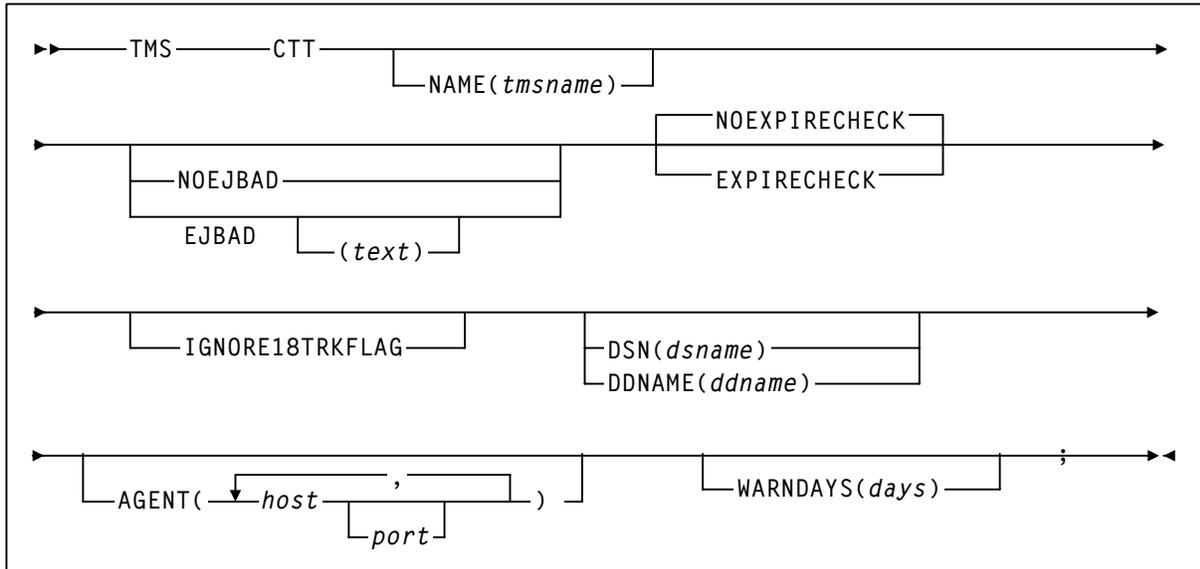
Figure 46. TMS CTT Statement Syntax

Parameters

Table 29 lists the valid abbreviations for the `TMS CTT` statement.

Table 29. TMS CTT Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK

`NAME`
specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

tmsname
the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`NOEJBAD` **|** `EJBAD`

specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (`NOEJBAD`).

You can also specify this parameter for all TMSs on the `OPTIONS` statement.

text

specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`NOEXPIRECHECK` **|** `EXPIRECHECK`

specifies whether ExLM ignores expiration information in the TMS and treats the volume as a nonscratch volume. When you specify `NOEXPIRECHECK`, you can use the residual data in the TMS catalog that contains the data set name and location code of the volume.

`NOEXPIRECHECK` specifies that ExLM should treat volumes that are marked expired in the TMS as expired volumes. ExLM treats expired volumes as `CYCLESOON` volumes; for more information, see "`CYCLESOON`" on page 134.

`IGNORE18TRKFLAG`

specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for all TMSs on the `OPTIONS` statement.

`DSN`

specifies the DSname of the Control-T TMS tape catalog.

You can specify `DSN` or `DDNAME` but not both. If you specify `AGENT`, you must also specify `DSN`.

dsname

the DSname of the TMS catalog. The file referenced by *dsname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume.

`DDNAME`

specifies the ddname of the Custom Interface's TMS catalog.

You can specify `DDNAME` or `DSN` but not both.

ddname

The ddname of the JCL DD statement for the TMS catalog. The file referenced by *ddname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume. The default is `LCMTMSDB`. For more information, see "TMS CUSTOM Interface Module Parameters" on page 80.

`AGENT`
> specifies that ExLM accesses information for the specified TMS from an ExLM Agent running on the specified host using the specified port.
>
> If you specify `AGENT`, you must also specify `DSN`.
>
> ***host***
>> specifies the host where ExLM Agent is running. You can specify an IP address or a host name.
>
> ***port***
>> specifies the port number of the ExLM Agent. If *port* is not specified, the default is 3002.

`WARNDAYS`
> specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.
>
> `1|` ***days***
>> the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

Usage

For more information, see "Using ExLM with Control-T" on page 73.

TMS CUSTOM

The `TMS CUSTOM` statement defines and selects processing options for a TMS that uses the ExLM Custom TMS interface. For more information, see "Using ExLM with a Custom TMS Interface Module" on page 74.

Syntax

Figure 47. TMS CUSTOM Statement Syntax

Parameters

Table 30 lists the valid abbreviations for the `TMS CUSTOM` statement.

Table 30. TMS CUSTOM Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK

`NAME`

> specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

> *tmsname*
>> the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`WARNDAYS`

> specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.

> 1| *days*
>> the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

`DSN`

> specifies the DSname of the Custom Interface TMS's tape catalog.

> You can specify `DSN` or `DDNAME` but not both. If you specify `AGENT`, you must also specify `DSN`.

> *dsname*
>> the DSname of the TMS catalog. The file referenced by *dsname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume.

`DDNAME`

> specifies the ddname of the Custom Interface's TMS catalog.

> You can specify `DDNAME` or `DSN` but not both.

> *ddname*
>> The ddname of the JCL DD statement for the TMS catalog. The file referenced by *ddname* must be a sequential file containing variable length records. Each record in the file provides TMS information about one volume. The default is

`LCMTMSDB`. For more information, see "TMS CUSTOM Interface Module Parameters" on page 80.

`AGENT`
specifies that ExLM accesses information for the specified TMS from an ExLM Agent running on the specified host using the specified port.

If you specify `AGENT`, you must also specify `DSN`.

host
specifies the host where ExLM Agent is running. You can specify an IP address or a host name.

port
specifies the port number of the ExLM Agent. If *port* is not specified, the default is 3002.

`NOEXPIRECHECK`|`EXPIRECHECK`
specifies whether ExLM ignores expiration information in the TMS and treats the volume as a nonscratch volume. When you specify `NOEXPIRECHECK`, you can use the residual data in the TMS catalog that contains the data set name and location code of the volume.

`EXPIRECHECK` specifies that ExLM should treat volumes that are marked expired in the TMS as expired volumes. ExLM treats expired volumes as `CYCLESOON` volumes; for more information, see "`CYCLESOON`" on page 134.

`NOEJBAD` | `EJBAD`
specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (`NOEJBAD`).

Hint: You can also specify this parameter for a specific TMS on the `TMS` statement.

text
specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for all TMSs on the `OPTIONS` statement.

MODNAME
: specifies the name of the Custom Interface module for the TMS; for more information, see "TMS CUSTOM Interface Module Parameters" on page 80.

modname
: the module name. The default is `LCMUX01`.

PARM
: specifies a variable-length text string (from zero to fifty characters in length), that is passed to the Custom Interface module; for more information, see "TMS CUSTOM Interface Module Parameters" on page 80.

text
: The text string. There is no default value for *text*.

Usage

Use the `TMS CUSTOM` statement to define and select processing options for a TMS that uses the ExLM Custom TMS interface. For more information, see "Using ExLM with a Custom TMS Interface Module" on page 74.

TMS OPEN

The `TMS OPEN` statement defines and selects processing options for Open Systems clients.
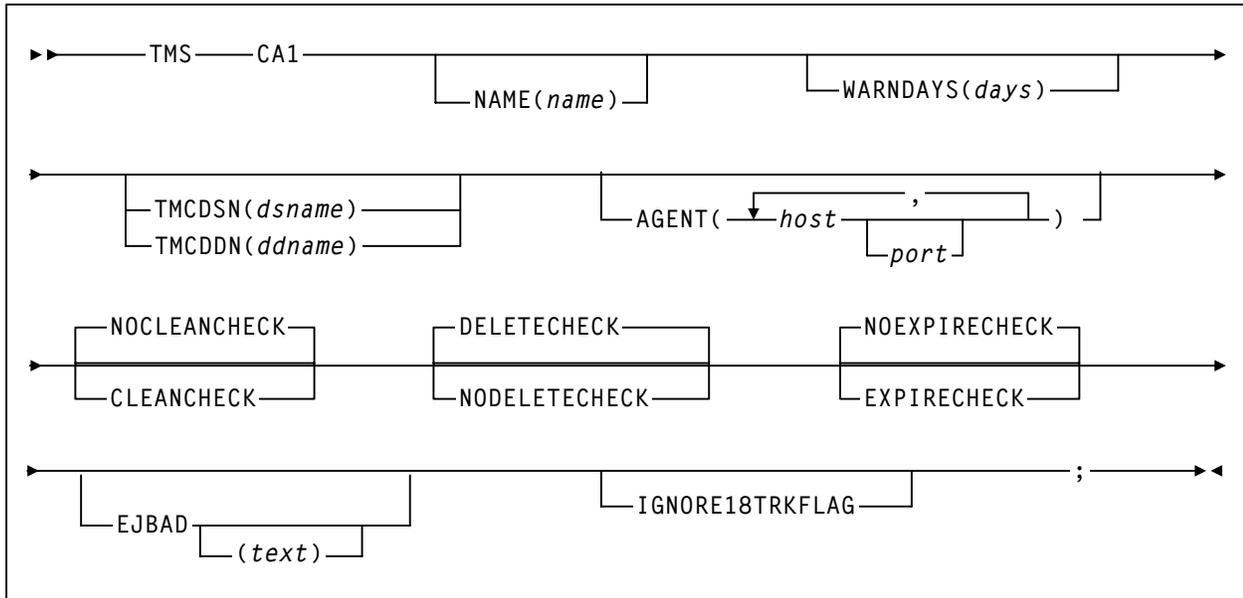
Syntax
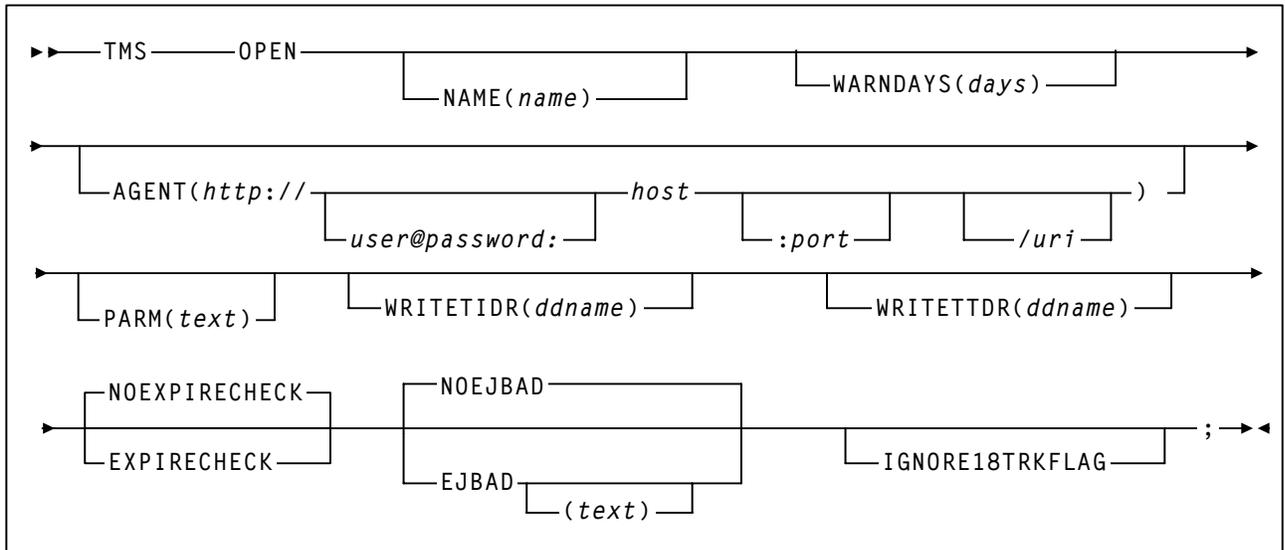
Figure 48. TMS OPEN Statement Syntax

Parameters

Table 31 lists the valid abbreviations for the `TMS OPEN` statement.

Table 31. TMS OPEN Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK

`NAME`
> specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

> ***tmsname***
>> the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`WARNDAYS`
> specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.

> `1`| ***days***
>> the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

AGENT
> Specifies that ExLM accesses information for the specified TMS from a TMS Agent running on the specified host using the specified port and Uniform Resource Identifier. This parameter must be an absolute HTTP address as described in the HTTP 1.1 protocol (see rft 2616).

> ***user@password***
>> If the http server that ExLM is connecting to requires authentication, then this will allow you to specify a user name and password that the server can authenticate.

> ***host***
>> Specifies the host where the TMS agent is running. You can specify an IP address or a host name.

> ***port***
>> Specifies the port number of where the TMS agent is running. If *port* is not specified, the default is 3002.

uri

> Specifies the Uniform Resource Identifier to use when retrieving information about tape metadata for this TMS statement. If *uri* is not specified, '`/tms `' is used. For example, if you code the following:

`AGENT (http://storagetek.storagetek.com:3002/tapes/metadata/ExLMAgent.cgi)`

> Then ExLM will POST its requests for this `TMS OPEN` statement to the indicated host and port using the uri `/tapes/metadata/ExLMAgent.cgi`. The HTTP server on that host must be set up to accept and respond to `ExLM TMS OPEN` requests.

PARM

> Specifies a variable-length text string (from zero to fifty characters in length) that is passed to the TMS agent. For more information on how to use this parameter see "Using ExLM with Open Systems Clients" on page 83.

text

> The text string. There is no default value for text.

WRITETIDR

> Specifies whether ExLM writes out the TMS Interface Definition Response document that it receives from the TMS OPEN host to the DDName specified. If no DDName is specified then the DDName LCMTIDR will be used. See "Using ExLM with Open Systems Clients" on page 83 for more information regarding the TMS Interface Definition Response document.

WRITETTIR

> Specifies whether ExLM writes out the TMS Tape Information Response document that it receives from the TMS OPEN host to the DDName specified. If no DDName is specified then the DDName LCMTTIR will be used. See "Using ExLM with Open Systems Clients" on page 83 for more information regarding the TMS Tape Information Response document.

`NOEXPIRECHECK`|`EXPIRECHECK`

> specifies whether ExLM ignores expiration information in the TMS and treats the volume as a nonscratch volume. When you specify `NOEXPIRECHECK`, you can use the residual data in the TMS catalog that contains the data set name and location code of the volume.

> `EXPIRECHECK ` specifies that ExLM should treat volumes that are marked expired in the TMS as expired volumes. ExLM treats expired volumes as `CYCLESOON` volumes; for more information, see "`CYCLESOON`" on page 134.

`NOEJBAD` | `EJBAD`
> specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (`NOEJBAD`).

> You can also specify this parameter for all TMSs on the `OPTIONS` statement.

> *text*
>> specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
> specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

> If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

> **Hint:** You can also specify this parameter for all TMSs on the `OPTIONS` statement.

Usage

Use the `TMS OPEN` statement to define and select processing options for Open Systems clients. For more information, see "Using ExLM with Open Systems Clients" on page 83.

TMS RMM

The `TMS RMM` statement defines DFSMSrmm to ExLM and selects processing options for DFSMSrmm.

Syntax

```
►►─TMS─RMM────────────────────────────────────────────────────────────►
           └─NAME(name)─┘   └─DATEFORM(dateformat)─┘   └─WARNDAYS(days)─┘

►────────────────────────────────────────────────────────────────────►
    ├─DSN(dsname)──────┤       └─AGENT(──┬─host──┬───,───┬──)─┘
    ├─DDNAME(ddname)───┤                 │       └─port─┘
    └─API─────────────┘

►────────────────────────────────────────────────────────────────────►
    └─TEMPERRORS(──────────errors──────────────)─┘
                 └─mediatype──,──errors─┘

►────────────────────────────────────────────────────────────────────►
    └─PERMERRORS(──────────errors──────────────)─┘
                └─mediatype──,──errors─┘

    ┌─NOEXPIRECHECK─┐   ┌─NOEJBAD──────────┐
►──┼───────────────┼──┼──────────────────┼──┬──────────────────┬──;──►◄
    └─EXPIRECHECK───┘   └─EJBAD────────────┘  └─IGNORE18TRKFLAG─┘
                              └─(text)─┘
```
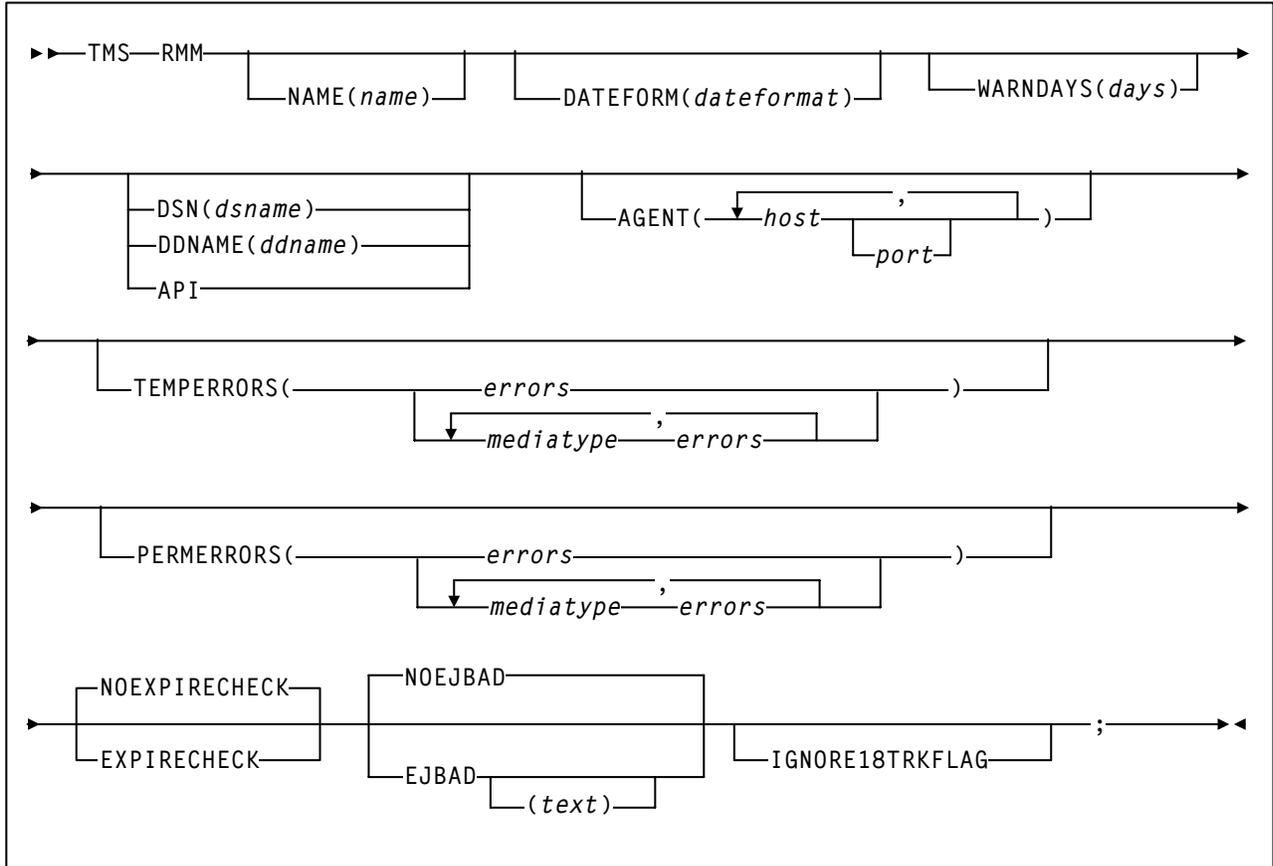
Figure 49. TMS RMM Statement Syntax

Parameters

Table 32 lists the valid abbreviations for the `TMS RMM` statement.

Table 32. TMS RMM Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK
STANDARD	S, ST, STA, STAN, CST MEDIA1, STD, 1, 3480
LONG	L, LO, LON, ECART, E, ECCST, ETAPE, MEDIA2, 3490E
DD3A	A
DD3B	B
DD3C	C
ZCART	Z

`NAME`
> specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

tmsname
> the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

DATEFORM

specifies the date format for the extract file.

dateformat

one of the following:

- 'A' (American *mm*/*dd*/*yyyy*)

- 'J' (Julian *yyyy*/*ddd*)

- 'E' (European *dd*/*mm*/*yyyy*)

- 'I' (ISO *yyyy*/*mm*/*dd*)
   If not specified, the default is 'I'.

`WARNDAYS`

specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.

`1`| *days*

the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

`DSN`

specifies the DSname of the DFSMSrmm report extract data set.

`DDNAME`, `DSN`, and `API` are mutually exclusive.

dsname

the DSname of the DFSMSrmm report extract data set.

`DDNAME`

specifies the ddname of the DFSMSrmm report extract data set.

`DDNAME`, `DSN`, and `API` are mutually exclusive.

ddname

The ddname of the JCL DD statement for the DFSMSrmm report extract data set. The default is `LCMTMSDB`.

`API`

specifies that ExLM obtains information from the RMM API.

`DDNAME`, `DSN`, and `API` are mutually exclusive.

Warning: The **disadvantage** of using the DFSMSrmm API is that you may experience a significant increase in execution time with the API compared to the

extract file interface. The API, therefore, is the non-default interface except with
ExLM Agent.

AGENT
specifies that ExLM accesses information for the specified TMS from an ExLM
Agent running on the specified host using the specified port.

host
specifies the host where ExLM Agent is running. You can specify an IP address
or a host name.

port
specifies the port number of the ExLM Agent. If *port* is not specified, the
default is 3002.

.TEMPERRORS
specifies the number of temporary read or temporary write errors that indicate a
scratch volume is defective. For more information, see "EJBAD" on page 62.

errors
the number of errors. Valid values are 1 to 9999 and the default value is 10.
Setting this value to 0 will disable the function and ExLM will not indicate a
scratch volume as defective regardless of the number of temporary read or
temporary write errors for the volume.

mediatype mediaerrors
the media type and number of errors.   For *mediaerrors*, valid values are 1 to
9999 and the default value is 10. Setting this value to 0 will disable the function
and ExLM will not indicate a scratch volume as defective regardless of the
number of temporary read or temporary write errors for the volume. For
mediatype, the following are valid values:

STANDARD
Standard length 3480 cartridge. It can be used on any 4480 or 4490
transport. If written in 36 track mode on a 4490 transport, the data cannot
be read by a 18 track 4480 transport.

LONG
3490E enhanced capacity (ECART) cartridge. It can be used only on 36
track transports (4490 or 9490) and can be visually identified by the two
tone colored case.

DD3A
10 Gb capacity helical cartridge.

DD3B
25 Gb capacity helical cartridge.

DD3C

>   50 Gb capacity helical cartridge.

STK1R

>   250 Gb capacity 9840 cartridge.

STK2

>   any 9940 cartridge.

STK2P

>   60 Gb capacity 9940 cartridge.

ZCART

>   3490EE cartridge (ZCART), which can only be used in a 9490EE
>   transport.

PERMERRORS

>   specifies the number of permanent read or permanent write errors that indicate a
>   scratch volume is defective. For more information, see "EJBAD" on page 62.

>   ### *errors*
>
>   >   the number of errors. Valid values are 1 and 9999 and the default value is 10.
>   >   Setting this value to 0 will disable the function and ExLM will not indicate a
>   >   scratch volume as defective regardless of the number of permanent read or
>   >   permanent write errors for the volume.

>   ### *mediatype mediaerrors*
>
>   >   the media type and number of errors.   For *mediaerrors*, valid values are 1 to
>   >   9999 and the default value is 10. Setting this value to 0 will disable the function
>   >   and ExLM will not indicate a scratch volume as defective regardless of the
>   >   number of permanent read or permanent write errors for the volume. See
>   >   "mediatype mediaerrors" on page 184 for valid values for the *mediatype* field.

NOEXPIRECHECK | EXPIRECHECK

>   specifies whether ExLM ignores expiration information in the TMS and treats the
>   volume as a nonscratch volume. When you specify NOEXPIRECHECK, you can use the
>   residual data in the TMS catalog that contains the data set name and location code of
>   the volume.

>   EXPIRECHECK specifies that ExLM should treat volumes that are marked expired in
>   the TMS as expired volumes. ExLM treats expired volumes as CYCLESOON volumes;
>   for more information, see "CYCLESOON" on page 134.

NOEJBAD | EJBAD

>   specifies whether ExLM ejects all scratch volumes marked defective by the TMS.
>   The default is to not eject defective volumes (NOEJBAD).

>   You can also specify this parameter for all TMSs on the OPTIONS statement.

text
> specifies the text of message `SLS1251E` that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
> specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).
>
> If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for all TMSs on the `OPTIONS` statement.

Usage

Use the `TMS RMM` statement to define DFSMSrmm to ExLM and select processing options for DFSMSrmm. For more information, see "Using ExLM with DFSMSrmm" on page 54.

TMS TLMS

The `TMS TLMS` statement defines CA-TLMS to ExLM and selects processing options for CA-TLMS.
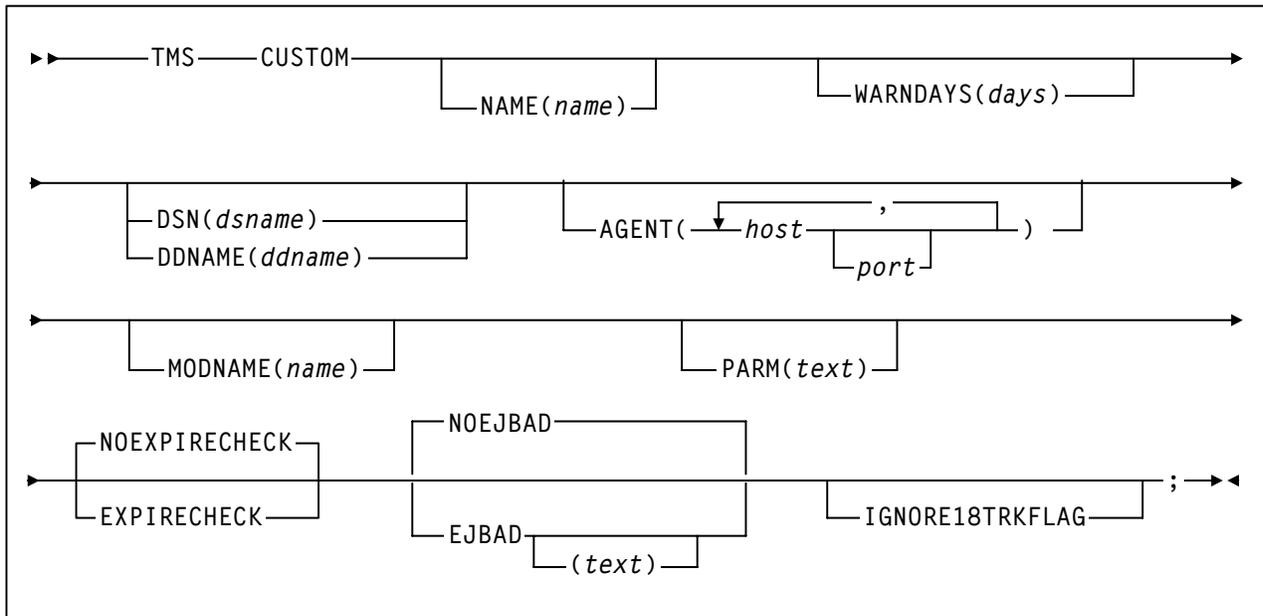
Syntax
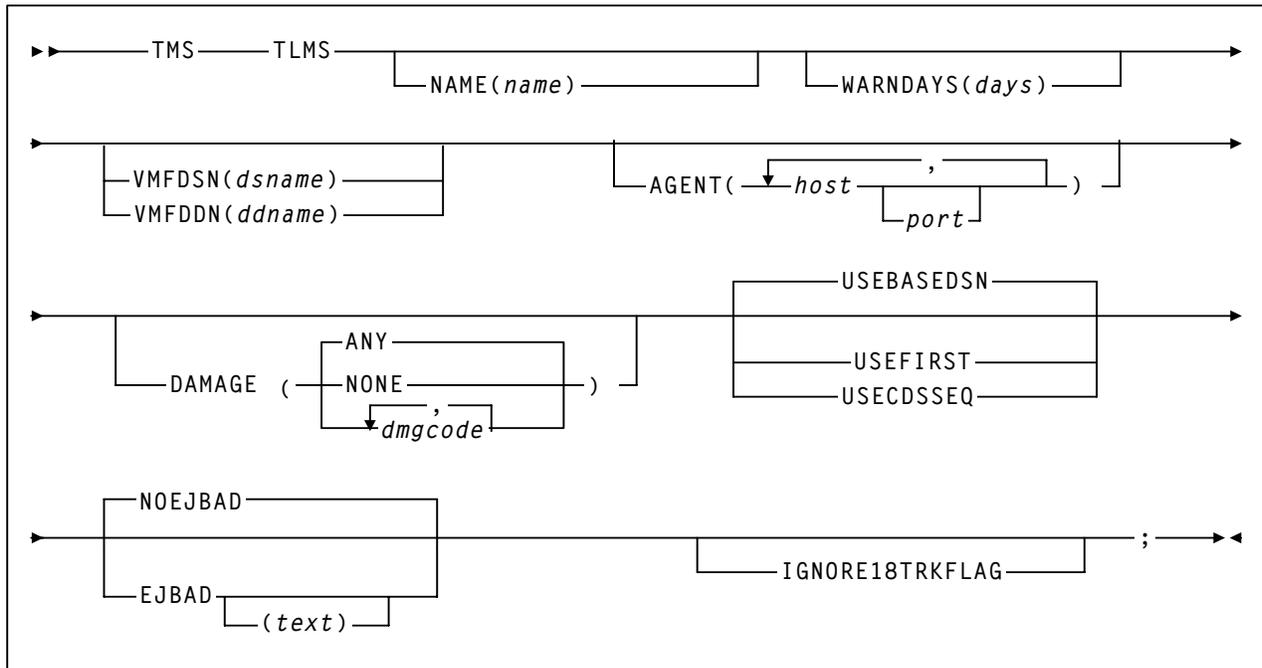
Figure 50. TMS TLMS Statement Syntax

Parameters

Table 33 lists the valid abbreviations for the `TMS TLMS` statement.

Table 33. TMS TLMS Statement Abbreviations

Statement or Parameter	Abbreviation
NAME	TMSNAME
NOEXPIRECHECK	NOEXPCHK
EXPIRECHECK	EXPCHK

`NAME`

> specifies the name for this TMS. Other statements (for example, `SUBPOOL`) can refer to this TMS name.

> **_tmsname_**
>
> > the TMS name. You can specify a maximum of 10 characters. The default TMS name is '`TMS`' followed by the number of the TMS statement.

`WARNDAYS`

> specifies that ExLM issues warning message `LCM0324W` if no volumes in the TMS have been referenced within the specified days. This parameter helps you detect an inactive TMS.

> **1 |** **_days_**
>
> > the days within which no volumes in the TMS have been referenced. ExLM uses the most recent volume reference day (DaysSinceReferenceTMS) for comparison. Valid values are 0 to 9999 and the default is 1. Specify a value of 0 if you do not want ExLM to perform this check.

`VMFDSN`

> specifies the dsname of the CA-TLMS Volume Master File (VMF).

> You can specify either `VMFDSN` or `VMFDD` but not both.

> **_dsname_**
>
> > the DSname of the CA-TLMS VMF.

`VMFDD`

> specifies the ddname of the TLMS VMF.

> You can specify either `VMFDD` or `VMFDSN` but not both.

> **_ddname_**
>
> > The ddname of the JCL DD statement for the CA-TLMS VMF. The default is `LCMTMSDB`.

`AGENT`

specifies that ExLM accesses information for the specified TMS from an ExLM Agent running on the specified host using the specified port.

If you specify `AGENT`, you must also specify `VMFDSN`.

host

specifies the host where ExLM Agent is running. You can specify an IP address or a host name.

port

specifies the port number of the ExLM Agent. If *port* is not specified, the default is 3002.

`DAMAGE(ANY | NONE | dmgcode)`

specifies which characters in the CA-TLMS `BADAMAGE` field causes ExLM to treat the volume as defective. For more information, see "EJBAD" on page 71.

`ANY`

specifies that any character greater than X'40' in the CA-TLMS `BADAMAGE` field causes ExLM to treat the volume as defective.

`DAMAGE(ANY)` is the default value if no `DAMAGE` parameter is specified.

`NONE`

specifies no character in the CA-TLMS `BADAMAGE` field marks the volume defective.

dmgcode

specifies which character(s) in the CA-TLMS BADAMAGE field are validated to determine if the volume is defective. Specify *dmgcode* as a single character enclosed in single quotes. The case of *dmgcode* characters is significant, so a lowercase 'y', for example, is not the same as an uppercase 'Y'. Multiple characters can be specified, so long as they are separated by one or more spaces. For example, the following is a valid way to specify multiple *dmgcode* values:

```
DAMAGE('y' 'Y')
```

`USEBASEDSN`

specifies that the BADSN field in the CA-TLMS VMF volume base record will be used as the controlling data set for each volume. `USEBASEDSN` is a default value if `USECDSSEQ` and `USEFIRST` are not specified. `USEBASEDSN`, `USECDSSEQ`, and `USEFIRST` are mutually exclusive.

`USEFIRST`

specifies that ExLM groups all volumes in a multi-volume set by first volume serial number. All volumes in a multi-volume set use the controlling data set name,

creation date, and creation time of the first volume in the set contained in the CA-TLMS VMF.

This allows you to assign a method based on the controlling data set name of the first volume in a set even when the controlling data set name is different for different volumes within the set.

Notes:

1. The CA-TLMS tape retention system (TRS) separates a multi-volume set with multiple controlling data set names based on retention master file (RMF) data set qualifiers and retention criteria.

2. If the controlling data set name of volume 2 through n in a set is different from volume 1, the Data Set Report displays the data set name and creation date of volume 1 for volumes 2 through n.

3. The order of volumes in the Data Set Report may be different with this parameter specified.

4. Approximately 20 percent more processing time is required for the additional sort of the CA-TLMS VMF.

USECDSSEQ
> For TLMS release 5.4 and above only, specifies that the BACDSSEQ field in a VMF volume base record determines the controlling data set for each volume.
>
> If any BACDSSEQ fields indicate the controlling data set for any volume is not the first file, some additional processing time occurs because ExLM will read all TLMS VMF multi-data set records in addition to the volume base records.
>
> USEBASEDSN is a default value if USECDSSEQ and USEFIRST are not specified. USEBASEDSN, USECDSSEQ, and USEFIRST are mutually exclusive.

NOEJBAD | EJBAD
> specifies whether ExLM ejects all scratch volumes marked defective by the TMS. The default is to not eject defective volumes (NOEJBAD).
>
> You can also specify this parameter for all TMSs on the OPTIONS statement.

text
> specifies the text of message SLS1251E that appears when the CAP door is unlocked to eject defective volumes. The text is a maximum of 32 characters. Enclose the text in single quotes if it contains blanks or other special characters. For more information, see "character string" on page 20.

`IGNORE18TRKFLAG`
specifies that ExLM treats all volumes in the TMS as cartridge tapes (not reel tapes).

If you specify `PICKSCR` but not `IGNORE18TRKFLAG`, ExLM selects only non-LSM scratch volumes that are marked as cartridge tapes in the TMS for entry into an LSM.

Hint: You can also specify this parameter for all TMSs on the `OPTIONS` statement.

Usage

For more information, see "Using ExLM with CA-TLMS" on page 63.

UNMANAGED

The UNMANAGED statement specifies an LSM group that is not managed by ExLM. ExLM does not move, eject, or update HSC scratch status of the volumes in this LSM group. You can, however, produce reports for this LSM group.

Syntax
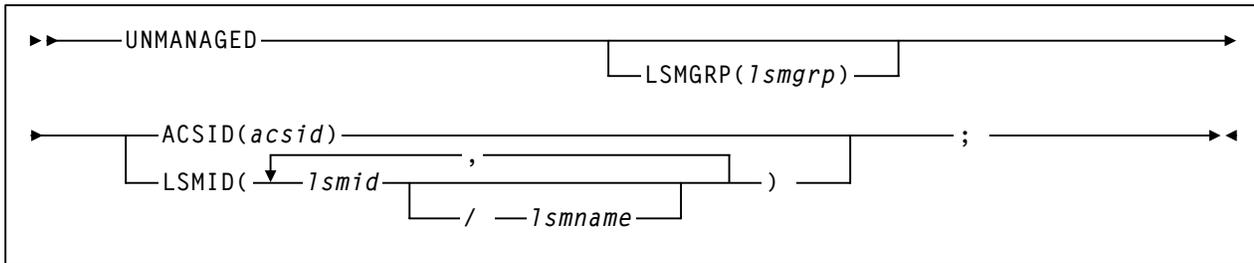
Figure 51. UNMANAGED Statement Syntax

Parameters

LSMGRP
: specifies the name of the LSM group.

  lsmgrp
  : the unique LSM group name. You can specify a maximum of 10 characters.

ACSID
: specifies that the LSM group includes an entire ACS.

  acsid
  : the hexadecimal ACS ID. Valid values are x'00' to x'FF'.

LSMID
: specified the ID of an LSM in the group.

  lsmid
  : the hexadecimal LSM ID. Valid values are '00:00' to 'FF:7F'.

  lsmname
  : the name to use for this LSM for reporting purposes. Specify a maximum of 10 characters.

Usage

Use the `UNMANAGED` statement to specify an LSM group that is not managed by ExLM. You can generate reports for this LSM group. LSM and LSM group names defined by the `UNMANAGED` statement can be used in `REPORT VOLUME WHEN` conditions.

Note the following restrictions:

- You can specify an LSM group in either a `MANAGE PHYSICAL` or `UNMANAGED` statement, but not both.

- An LSM group specified by an `UNMANAGED` statement cannot referenced by the `LSMGRP` parameter of a `METHOD` statement.

- A LSM group specified by an `UNMANAGED` statement cannot be referenced by the `NEXT` parameter of a `MANAGE PHYSICAL` statement.

- Volumes in LSM groups specified by an `UNMANAGED` statement will not be assigned management methods. The `SET METHOD` statement does not apply to volumes in LSM groups specified by an `UNMANAGED` statement.

Chapter 5. ExLM Action Control Statements

This chapter contains reference information for the following ExLM control statements:

ACTION CONSOLIDATE

The `ACTION CONSOLIDATE` statement consolidates VTVs.

Syntax
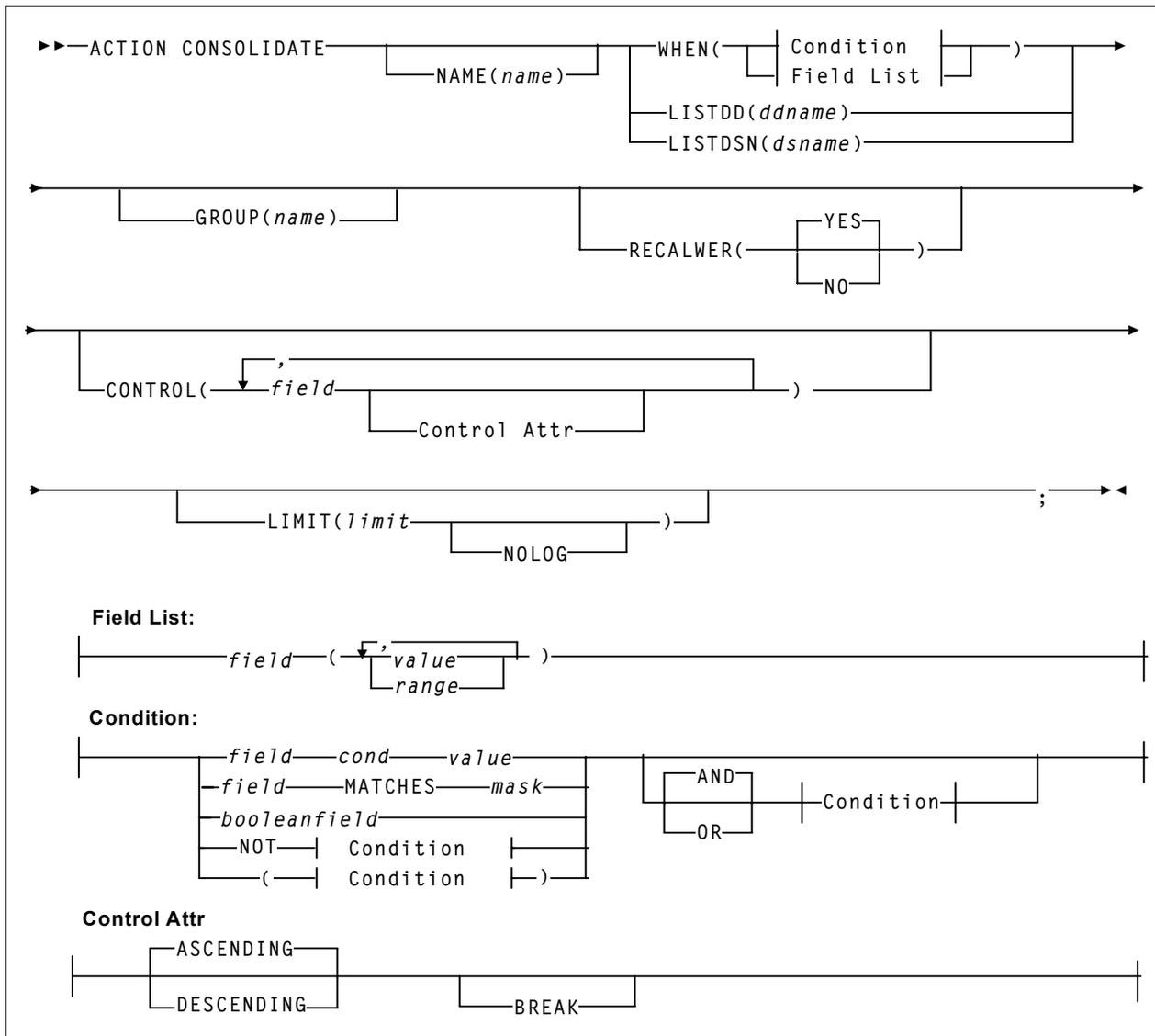
Figure 52. ACTION CONSOLIDATE Statement Syntax

Parameters

LISTDD
> the DD name of a file containing volsers for selection.

> *ddname*
>> the ddname.

LISTDSN
> the data set name of a file containing volsers for selection.

> *dsname*
>> the data set name.

> **Note:** In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

WHEN(`condition`**)**
> specifies one of the following for volume selection:

> **Field List**
>> specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

> **Condition**
>> specifies a condition for volume selection.

>> *field cond value*
>>> specifies a field, a condition, and a value to compare with one of the following conditions:

>>> **EQ**
>>>> equal to.

>>> **NE**
>>>> not equal to.

>>> **GE**
>>>> greater than or equal to.

>>> **GT**
>>>> greater than.

>>> **LE**
>>>> less than or equal to.

>>> **LT**
>>>> less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` ***mask***

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME, BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

  "`**`" matches one or more data set qualifiers.

  "`*`" matches one or more characters within a qualifier.

  "`%`" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "`*`" matches one or more characters.

  "`%`" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

GROUP

specifies a group name for the volumes.

name

the 1 to 8 character group name. The default is `Default`.

RECALWER

specifies whether VTCS recalls VTVs with read data checks.

YES

recall VTVs with read data checks (the default).

NO

do not recall VTVs with read data checks.

CONTROL

specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:

`CONTROL(SERIAL ASCENDING).`

`field`

specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr

specifies control information for the preceding sort field.

`ASCENDING`|`DESCENDING`

specifies whether to process the selected volumes in ascending or descending volser order.

BREAK

specifies that when any of the previously specified *field*s changes, ExLM completes the current consolidation request and begins a new one. This forces a new set of consolidation MVCs to be used for the next request. For example, if you specify:

`CONTROL(LOCNAME BREAK, SLOTS, SERIAL)`

ExLM processes volumes in location name, slot, and volume serial order—and begins a new consolidation request between location name changes.

You can only specify `BREAK` once in a `CONTROL` parameter. If you do not specify `BREAK`, ExLM does not begin a new request when control fields change.

LIMIT

specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

`limit`

specify a number between 1 and 999999.

NOLOG

specifies that ExLM does not issue message `LCM2317`.

Usage

Use the `ACTION CONSOLIDATE` statement to consolidate selected VTVs. You cannot consolidate VTVs that are already consolidated.

Note that you can also specify a consolidation group name on the `METHOD` statement; for more information, see "METHOD" on page 117. If you specify the same group name on different statements or on different conditions within the same `METHOD` statement, all VTVs with the same group name are consolidated on a common set of consolidation MVCs. Use different consolidation group names to segregate different VTV groups on separate sets of consolidation MVCs.

ACTION EJECT

The ACTION EJECT statement ejects Nearline volumes.

Syntax

```
►►──ACTION EJECT───────┬──────────────────┬──── WHEN(──┬─ Condition ─┬──┬──)─┬──►
                       └─ NAME(name) ─┘              └─ Field List ─┘  └────┘
                                                ├── LISTDD(ddname) ──────────┤
                                                └── LISTDSN(dsname) ─────────┘

►───────┬──────────────────────────────┬────────────┬─ EJMSG(text) ─┬───────►
        │                   ,           │            └───────────────┘
        └─ EJCAP──(──▼─ lsmid ──┴──)─┘

►───────┬─────────────────────────────────────┬──────┬─ EJMULT(mult) ─┬──────►
        │             ┌─ CLOSEST ─┐           │      └────────────────┘
        └─ EJMODE──(──┼─ SINGLE ──┼──)─┘
                      └─ COLLATE ──┘

►───────┬───────────────────────────────────────────┬───────────────────────►
        │                      ,                     │
        └─ CONTROL(──▼─ field ──┬───────────────┬──)─┘
                               └─ Control Attr ─┘

►───────┬──────────────────────────────────────┬──────────────────────────; ►◄
        └─ LIMIT(limit ──┬──────────┬──)─┘
                         └─ NOLOG ──┘
```

Field List:
```
├──────── field ──(──▼─┬─ value ─┬──┬──)──────────────────────┤
                       └─ range ─┘
```

Condition:
```
├───┬─ field ── cond ── value ─────────┬───┬─ AND ─┬──┬───────────┬──┤
    ├─ field ── MATCHES ── mask ───────┤   └─ OR ──┘  ├ Condition ┤
    ├─ booleanfield ───────────────────┤
    ├─ NOT ──┤ Condition ├─────────────┤
    └─ (──┤ Condition ├──)─────────────┘
```

Control Attr
```
├──┬─ ASCENDING ──┬──┬───────────┬──┤
   └─ DESCENDING ─┘  └─ BREAK ───┘
```
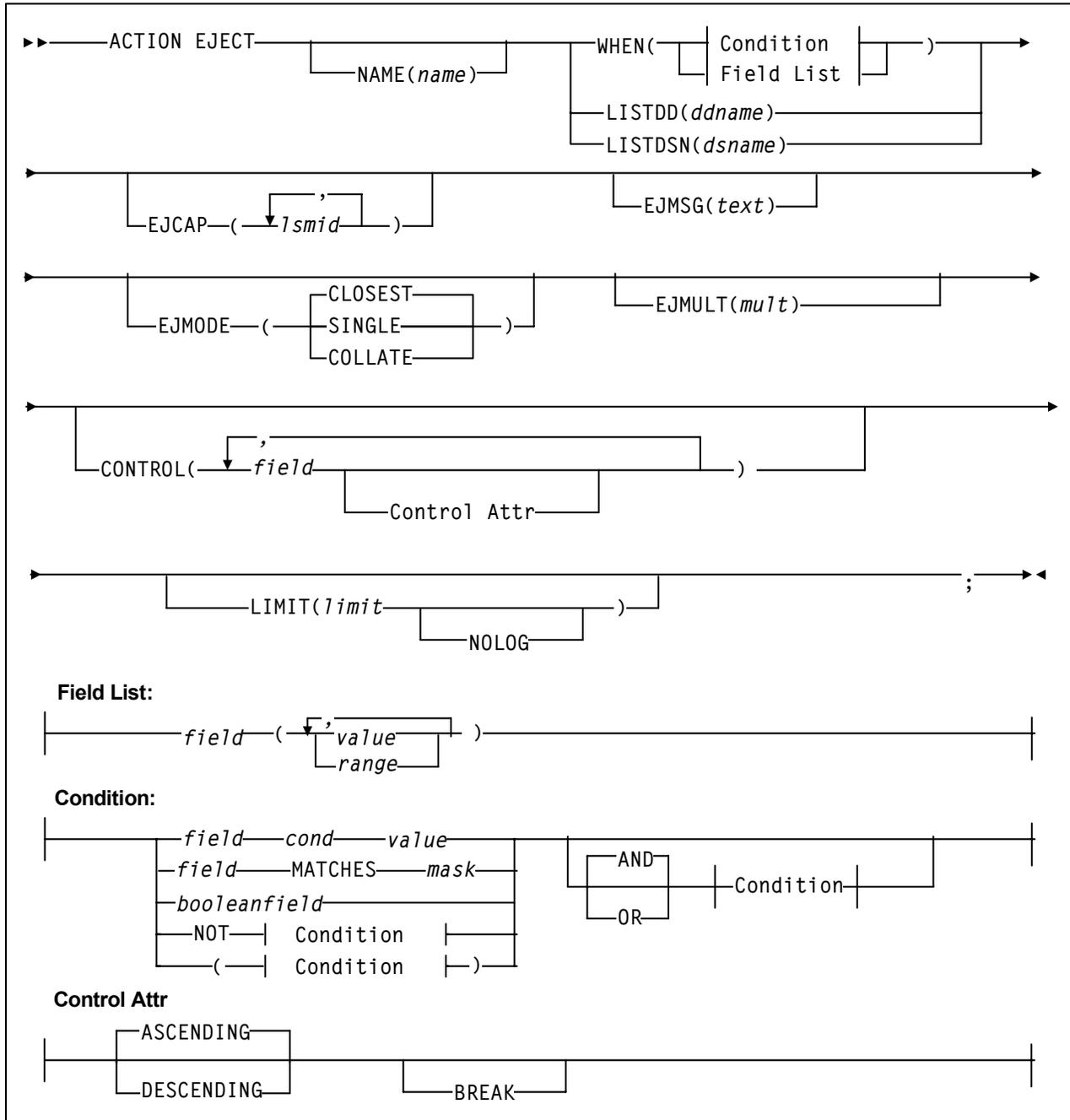
Figure 53. ACTION EJECT Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each *field* must match at least one of the provided *values* or *ranges*.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field MATCHES *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"**"" matches one or more data set qualifiers.

"*" matches one or more characters within a qualifier.

"%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*" matches one or more characters.

"%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD

the DD name of a file containing volsers for selection.

ddname

the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname
> the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

`EJCAP`
> specifies a list of one or more LSMs whose CAPs are used for cartridge ejections. If this list does not contain at least one LSM for each managed ACS, ExLM assumes that all LSMs in that ACS are available for use (which is also the default if you do not specify a value for `EJCAP`). `ACTION EJCAP` overrides this setting on the `OPTIONS` statement.

lsmid
> the hexadecimal LSM ID (00:00' to FF:7F'). Note that you cannot specify individual CAPS within an LSM and ExLM will not use priority CAPs. You can, however, use the ExLM `DISPLAY`, `PAUSE`, `REDIRECT`, and `RESUME` commands to manage ExLM activity for specific CAPs; for more information, see:
>
> - "DISPLAY" on page 349
> - "PAUSE" on page 351
> - "REDIRECT" on page 353
> - "RESUME" on page 354

EJMSG

specifies the text of the eject message (SLS1251E).

If you do not specify this parameter, ExLM uses a text of 'Action Stmt' followed by a number indicating which `ACTION` statement is controlling the ejects. For example, if the fourth `ACTION` statement is controlling the ejects, the ExLM job name is `EXLM`, and the CAP is 00:00, the following messages will be issued when the CAP door is unlocked:

```
SLS0259A CAP PROCESSING TERMINATED; EMPTY CAPID 00:00

SLS1251E CAPID 00:00 (EXLM): ACTION STMT 1
```

text

the message text, which is a maximum of 32 characters (longer strings are truncated to 32 characters). Enclose the character string in single quotes if it contains blanks or other special characters. For more information, see "Textual Data" on page 20.

Any of the fields in the "ACTION Statement Fields" section of *ExLM Quick Reference* can be specified in the text string by placing the ampersand character (''&'') before the field and a period (''.'') after the field. The period is optional if the character immediately following the field is not an alphanumeric or national character.

Hint: A new `EJMSG` is generated for each CAP break using the text you specify. For example, if you specify CAP break on location name, you can include &locationname. as part of your message text as follows:

EJMSG('Location &locationname.').

`EJMODE`

specifies that ExLM uses the `EJCAP` list as follows:

`CLOSEST`

eject volumes through the CAPs closest to the volume location (the default).

`SINGLE`

eject volumes through the CAPs of only one LSM per ACS. ExLM tries to minimize pass-throughs when it selects an LSM from the `EJCAP` list.

`COLLATE`

eject volumes through the CAPs of the LSMs in the `EJCAP` list in ascending order. ExLM ejects the lowest ordered set of volumes from the first `EJCAP`, the next lowest ordered set of volumes is ejected from the second `EJCAP`, and so forth. ExLM will use as many of the LSMs in the `EJCAP` list as can be used at

least once. The "collating sequence" of volume ejections is either by slot number or volser, depending on whether you specified `SLOTS` or `NOSLOTS`.

The `EJMODE` parameter is only valid if CAPs of multiple LSMs are included in the `EJCAP` list and are available. `ACTION EJMODE` overrides this setting on the `OPTIONS` statement.

`EJMULT`

 eject volumes in multiples specified by *mult*. For example, for `EJMULT`(10), ExLM ejects volumes in multiples of ten, which can include situations such as ejecting forty volumes at a time through an Enhanced CAP.

 Hint: You can use `EJMULT` to force volume ejections in amounts that fit evenly into cases or magazines for transport. For example, to fill a 10-cell magazine evenly, specify `EJMULT`(10).

 `EJMULT` has no effect on the selection of a CAP for eject processing. For example, specifying `EJMULT`(40) does not prevent ExLM from selecting a 21-cell CAP for ejection.

 StorageTek recommends that you do **not** specify an `EJMULT` value that is larger than the capacity of the smallest CAP used. For example, if you specify `EJMULT(40)` and a 21-cell CAP is used for ejects, ExLM ejects volumes in batches of 40, which means that the operator has to empty the CAP twice (21 volumes followed by 19 volumes) for each batch of 40 volumes.

 StorageTek also recommends that you do **not** specify large values (such as 200) for `EJMULT`. `PAUSE` commands (without the `IMMED` operand) do not take effect for a specific CAP until the current batch has been ejected, so large `EJMULT` values increase the delay before `PAUSE` commands take effect. There is no impact on `PAUSE` commands that specify the `IMMED` operand. The `EJMULT` parameter is only valid if CAPs of multiple LSMs are included in the `EJCAP` list and are available. `ACTION EJMULT` overrides this setting on the `OPTIONS` statement.

 mult

  the multiple that ExLM uses to eject volumes. Valid values are 1 to 500 inclusive and the default is 1.

CONTROL

 specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:

 `CONTROL(SERIAL ASCENDING)`.

 field

  specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

 attr

  specifies control information for the preceding sort field.

ASCENDING | DESCENDING
specifies whether to process the selected volumes in ascending or descending volser order.

BREAK
specifies that when any of the previously specified *field*s changes, the CAP door must be emptied before ejects can resume. For example, if you specify:

`CONTROL(LOCNAME BREAK, SLOTS, SERIAL)`

ExLM ejects volumes in location name, slot, and volume serial order— and waits for the CAP door to be emptied between location name changes.

You can only specify `BREAK` once in a `CONTROL` parameter. If you do not specify `BREAK`, ExLM does not force the CAP to be emptied when control fields change.

LIMIT
specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

limit
specify a number between 1 and 999999.

NOLOG
specifies that ExLM does not issue message `LCM2317`.

Usage

Use the `ACTION EJECT` statement to eject Nearline volumes selected by the statement conditions. All volumes selected are ejected together per the `ACTION EJECT` parameters. `ACTION EJECT` only applies to Nearline volumes that reside in an LSM (managed or unmanaged). `ACTION EJECT` ejections have priority over other ejects. If you specify multiple `ACTION EJECT` statements, ExLM performs the ejects in the same order as the statements appear in the parameter file.

For example, you can use the `ACTION EJECT` statement to eject used cleaning cartridges when you want rather than when HSC usually ejects them. For more information, see "Using ExLM to Manage Nearline Resources" on page 33.

ACTION EXPORT

The `ACTION EXPORT` statement exports VTVs and MVCs.

Syntax

```
►►──ACTION EXPORT──────┬──────────────────┬──────WHEN(─┬─ Condition ─┬──)──────►
                       └─NAME(name)───────┘            └─ Field List ┘
                                                ──LISTDD(ddname)───────────┤
                                                ──LISTDSN(dsname)──────────┘

►──┬──────────────────┬───────────────────────GROUP(name)───────────────────►
   ├─DDNAME(ddname)───┤
   └─DSN(dsname)──────┘

►──┬──────────────────────────────────────────────────────────────────────┬──►
   └─EJECT──┬───────────────┬──┬──────────────┬──────────────────────────────
            └─EJMSG(text)───┘  └─EJCAP(◄─,─lsm-id─)─┘
                                         ┌─CLOSEST─┐
                              └─EJMODE(──┼─SINGLE──┼──)─┘  └─EJMULT(mult)─┘
                                         └─COLLATE─┘

►──┬─────────────────────────────────────────────────────────────────────┬──►
   └─CONTROL(──┬─◄─,─┐──field──┬──────────────────┬──)─┘
                       └─Control Attr─┘

►──┬──────────────────────────────────────────────┬──────────────────;──►◄
   └─LIMIT(limit──┬──────────────┬──)─┘
                  └─NOLOG─┘

Field List:
├──field──(──┬─◄─,─┬─value──┬──)───────────────────────────────────────────┤
                   └─range──┘

Condition:
├──┬─field──cond──value──────┬──┬─┬─AND─┬──┬─Condition─┬────────────────────┤
   ├─field──MATCHES──mask────┤  │ └─OR──┘  └───────────┘
   ├─booleanfield────────────┤
   ├─NOT──┬─Condition─┬──────┤
   └─(──┬─Condition─┬──)─────┘

Control Attr
   ┌─ASCENDING──┐
├──┼────────────┼──┬──────────────┬─────────────────────────────────────────┤
   └─DESCENDING─┘  └─BREAK─┘
```

Figure 54. ACTION EXPORT Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to A00243.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"**" matches one or more data set qualifiers.

"*" matches one or more characters within a qualifier.

"%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*" matches one or more characters.

"%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD

the DD name of a file containing volsers for selection.

ddname

the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname
the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

DDNAME
the DD name of the `EXPORT` Manifest File.

ddname
the ddname.

DSN
the data set name of the `EXPORT` Manifest File.

ddname
the ddname.

If you do not specify either `DDNAME` or `DSN`, ExLM dynamically allocates an output data set for the Manifest File and logs message LCM23*xx* with the name of the Manifest File.

GROUP
specifies a group name for the volumes.

name
the 1 to 8 character group name. The default is `Default`.

EJECT
specifies that ExLM ejects:

- All exported MVCs,

- All MVCs used for consolidation of selected VTVs (if any), and

- All MVCs selected by the `ACTION` statement `WHEN` condition.
After any required VTV consolidations complete, MVCs ejected by an `ACTION` `EXPORT` statement are ejected together using the `EJMSG`, `EJCAP`, `EJMODE`, and `EJMULT` parameters from this statement.

EJMSG

specifies the text of the eject message (SLS1251E).

If you do not specify this parameter, ExLM uses a text of 'Action Stmt' followed by a number indicating which `ACTION` statement is controlling the ejects. For example, if the fourth `ACTION` statement is controlling the ejects, the ExLM job name is `EXLM`, and the CAP is 00:00, the following messages will be issued when the CAP door is unlocked:

```
SLS0259A CAP PROCESSING TERMINATED; EMPTY CAPID 00:00

SLS1251E CAPID 00:00 (EXLM): ACTION STMT 1
```

text

the message text, which is a maximum of 32 characters (longer strings are truncated to 32 characters). Enclose the character string in single quotes if it contains blanks or other special characters. For more information, see "Textual Data" on page 20.

Any of the fields in the "ACTION Statement Fields" section of *ExLM Quick Reference* can be specified in the text string by placing the ampersand character (''&'') before the field and a period (''.'') after the field. The period is optional if the character immediately following the field is not an alphanumeric or national character.

Hint: A new `EJMSG` is generated for each CAP break using the text you specify. For example, if you specify CAP break on location name, you can include &locationname. as part of your message text as follows:

EJMSG('Location &locationname.').

`EJCAP`

specifies a list of one or more LSMs whose CAPs are used for cartridge ejections. If this list does not contain at least one LSM for each managed ACS, ExLM assumes that all LSMs in that ACS are available for use (which is also the default if you do not specify a value for `EJCAP`). `ACTION EJCAP` overrides this setting on the `OPTIONS` statement.

lsmid

the hexadecimal LSM ID (00:00' to FF:7F'). Note that you cannot specify individual CAPS within an LSM and ExLM will not use priority CAPs. You can, however, use the ExLM `DISPLAY`, `PAUSE`, `REDIRECT`, and `RESUME` commands to manage ExLM activity for specific CAPs; for more information, see:

- "DISPLAY" on page 349
- "PAUSE" on page 351
- "REDIRECT" on page 353
- "RESUME" on page 354

EJMODE
>   specifies that ExLM uses the EJCAP list as follows:

>   CLOSEST
>>   eject volumes through the CAPs closest to the volume location (the default).

>   SINGLE
>>   eject volumes through the CAPs of only one LSM per ACS. ExLM tries to minimize pass-throughs when it selects an LSM from the EJCAP list.

>   COLLATE
>>   eject volumes through the CAPs of the LSMs in the EJCAP list in ascending order. ExLM ejects the lowest ordered set of volumes from the first EJCAP, the next lowest ordered set of volumes is ejected from the second EJCAP, and so forth. ExLM will use as many of the LSMs in the EJCAP list as can be used at least once. The "collating sequence" of volume ejections is either by slot number or volser, depending on whether you specified SLOTS or NOSLOTS.

>   The EJMODE parameter is only valid if CAPs of multiple LSMs are included in the EJCAP list and are available. ACTION EJMODE overrides this setting on the OPTIONS statement.

EJMULT
>   eject volumes in multiples specified by *mult*. For example, for EJMULT(10), ExLM ejects volumes in multiples of ten, which can include situations such as ejecting forty volumes at a time through an Enhanced CAP.

>   **Hint:** You can use EJMULT to force volume ejections in amounts that fit evenly into cases or magazines for transport. For example, to fill a 10-cell magazine evenly, specify EJMULT(10).

>   EJMULT has no effect on the selection of a CAP for eject processing. For example, specifying EJMULT(40) does not prevent ExLM from selecting a 21-cell CAP for ejection.

>   StorageTek recommends that you do **not** specify an EJMULT value that is larger than the capacity of the smallest CAP used. For example, if you specify EJMULT(40) and a 21-cell CAP is used for ejects, ExLM ejects volumes in batches of 40, which means that the operator has to empty the CAP twice (21 volumes followed by 19 volumes) for each batch of 40 volumes.

>   StorageTek also recommends that you do **not** specify large values (such as 200) for EJMULT. PAUSE commands (without the IMMED operand) do not take effect for a specific CAP until the current batch has been ejected, so large EJMULT values increase the delay before PAUSE commands take effect. There is no impact on PAUSE commands that specify the IMMED operand. The EJMULT parameter is only valid if CAPs of multiple LSMs are included in the EJCAP list and are available. ACTION EJMULT overrides this setting on the OPTIONS statement.

mult
the multiple that ExLM uses to eject volumes. Valid values are 1 to 500 inclusive and the default is 1.

CONTROL
specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:

`CONTROL(SERIAL ASCENDING).`

field
specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr
specifies control information for the preceding sort field.

`ASCENDING | DESCENDING`
specifies whether to process the selected volumes in ascending or descending volser order.

BREAK
specifies that when any of the previously specified *field*s changes, the CAP door must be emptied before ejects can resume. For example, if you specify:

`CONTROL(LOCNAME BREAK, SLOTS, SERIAL)`

ExLM ejects volumes in location name, slot, and volume serial order— and waits for the CAP door to be emptied between location name changes.

You can only specify BREAK once in a `CONTROL` parameter. If you do not specify BREAK, ExLM does not force the CAP to be emptied when control fields change.

LIMIT
specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

limit
specify a number between 1 and 999999.

NOLOG
specifies that ExLM does not issue message `LCM2317`.

Usage

Use the `ACTION EXPORT` statement to export selected VTVs and MVCs. Selected VTVs will be consolidated as needed. After consolidations are complete, a manifest file is produced for all MVCs involved in the Export operation, both MVCs used for consolidation and MVCs selected by the `WHEN` condition. The `ACTION` statement can optionally eject the MVCs after these operations complete. For more information, see "Using ExLM to do Exports" on page 39. Se also "ACTION CONSOLIDATE" on page 196.

Note that you can also specify an export group name on the `METHOD` statement. For more information, see "METHOD" on page 117. If you specify the same export group name on different statements or on different conditions within the same `METHOD` statement, all volumes with the same export group name will be exported together.

Use different export group names to segregate different export operations.

Example of an `ACTION` Statement:

```
action export
when(location = 'remote')
control(slot)
dsn(remote.manifest)
eject ejmsg('DR MVCs for Remote') ejcap(00:03);
```

This example action statement performs an EXPORT for all VTVs that have a Location name of `Remote`. The manifest file will be written to data set `remote.manifest,` which ExLM will create if needed. Following the creation of the manifest file, ExLM will eject the MVCs in ascending slot order through LSM 003's CAPs, using an eject message of `'DR MVCs for Remote'`.

ACTION MIGRATE

The `ACTION MIGRATE` statement migrates VTVs to MVCs.

Syntax
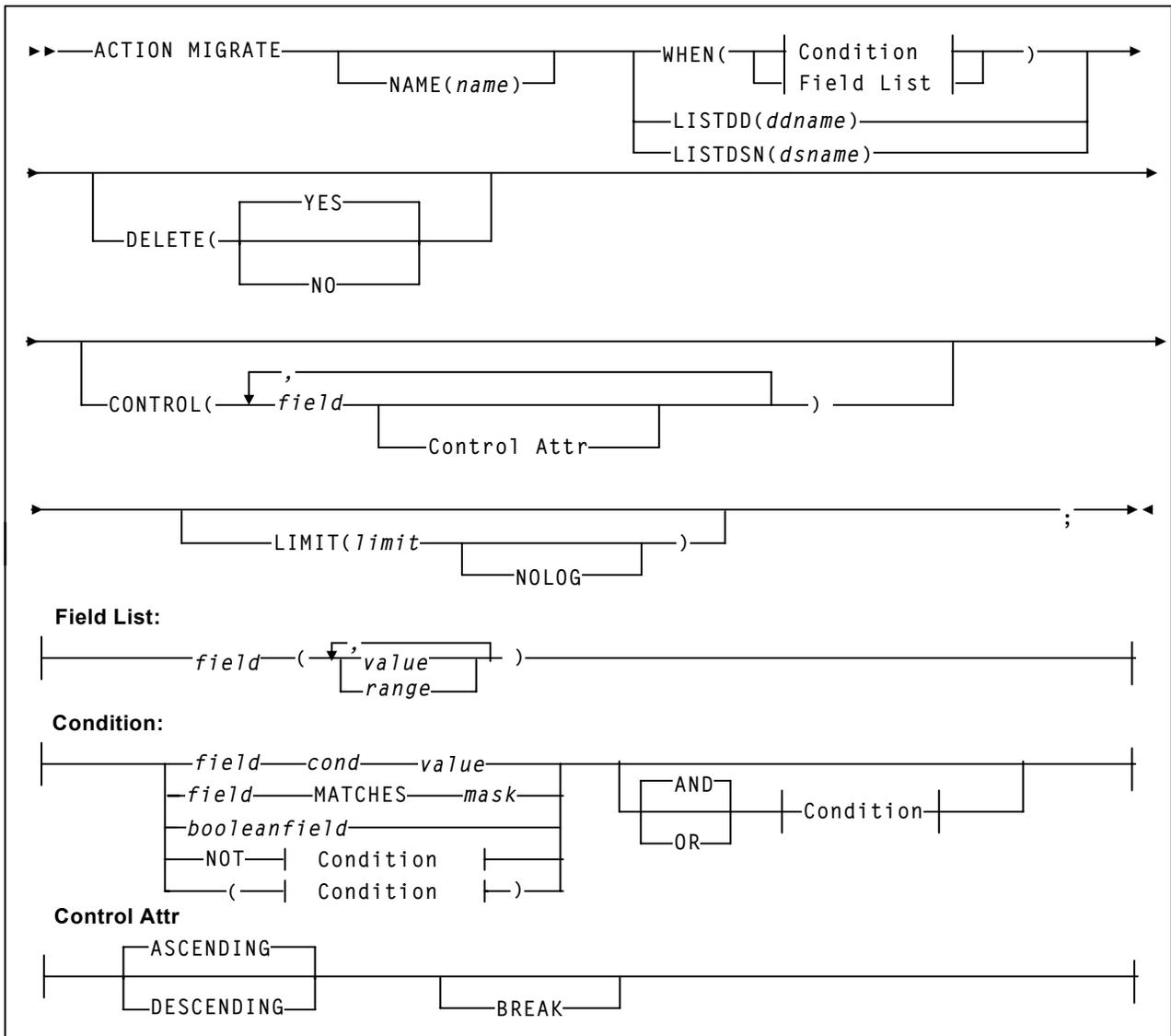
Figure 55. ACTION MIGRATE Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to A00243.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"******" matches one or more data set qualifiers.

"*****" matches one or more characters within a qualifier.

"**%**" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*****" matches one or more characters.

"**%**" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield
specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`
reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`
make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`
make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD
the DD name of a file containing volsers for selection.

ddname
the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname

the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

DELETE

specifies whether to delete the VTVs from the VTSS after migration completes.

YES

delete VTVs after migration completes (the default).

NO

do not delete VTVs after migration completes.

CONTROL

specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this ACTION statement. The default is:

CONTROL(SERIAL ASCENDING).

field

specifies a sort field. The same volume fields available for specifying WHEN conditions can also be specified on the CONTROL parameter.

attr

specifies control information for the preceding sort field.

ASCENDING|DESCENDING

specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT

specifies the maximum number of volumes processed by this ACTION statement. The limit is applied based on the sort order established by the CONTROL parameter.

limit

specify a number between 1 and 999999.

NOLOG

specifies that ExLM does not issue message LCM2317.

Usage

Use the ACTION MIGRATE statement to migrate VTVs to MVCs.

Example

The following ACTION MIGRATE statement performs a migrate delete(yes) for all VTVs that exist in a VTSS and have gone unreferenced for more than 8 hours, but do not already have a migration copy.

ACTION MIGRATE DELETE(YES)WHEN(RHOURS GT 8);

ACTION MOVE

The `ACTION MOVE` statement moves selected Nearline volumes.
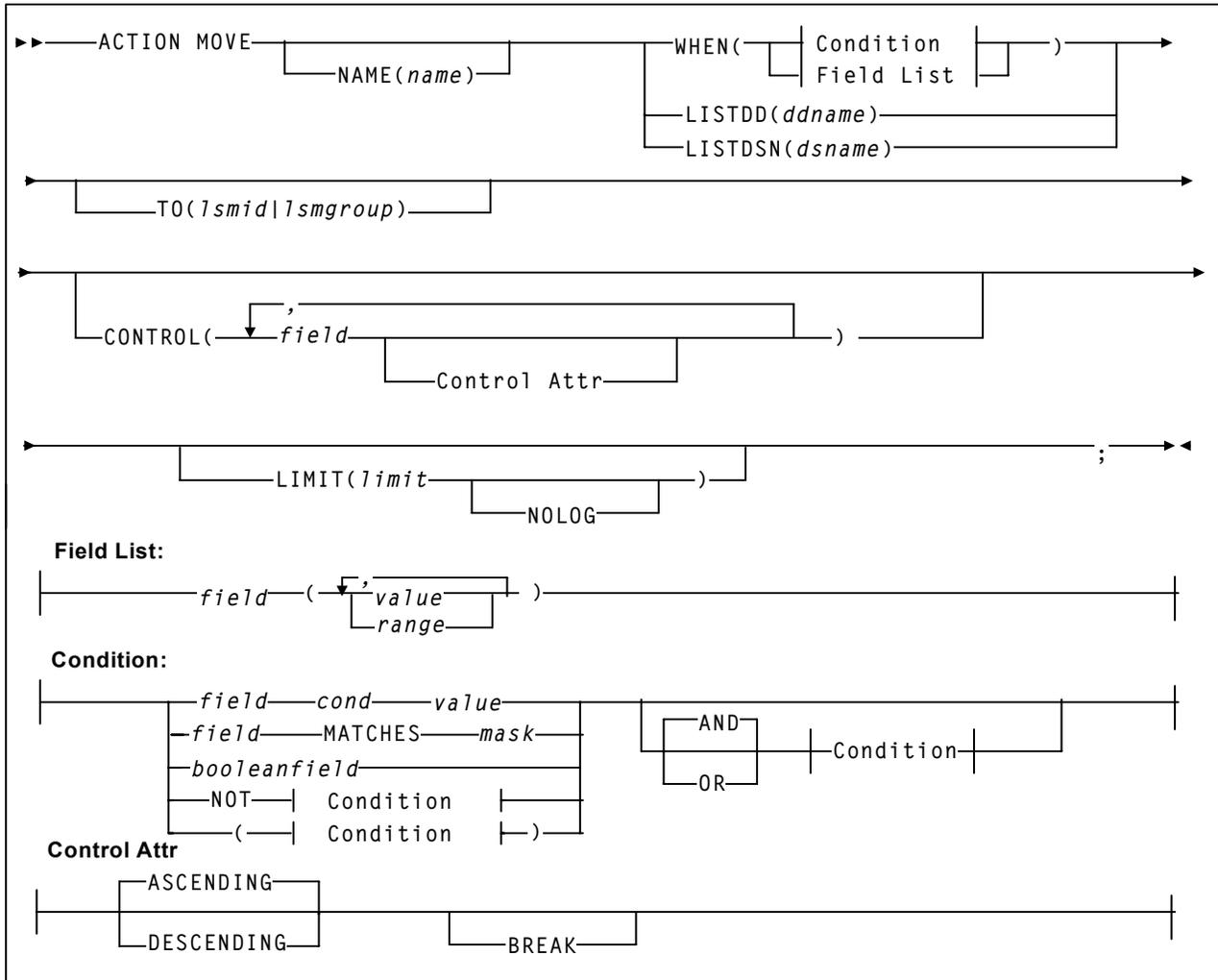
Syntax

Figure 56. ACTION MOVE Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each *field* must match at least one of the provided *values* or *ranges*.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"******" matches one or more data set qualifiers.

"*****" matches one or more characters within a qualifier.

"**%**" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*****" matches one or more characters.

"**%**" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD

the DD name of a file containing volsers for selection.

ddname

the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname
    the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

TO
    specifies the target LSM for the move by one of the following:

lsmid
    the target LSM in *AA*:*LL* format.

lsmgrp
    the LSM group name defined on `MANAGE PHYSICAL`.

LIMIT
    specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

limit
    specify a number between 1 and 999999.

    NOLOG
        specifies that ExLM does not issue message `LCM2317`.

CONTROL
    specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is: `CONTROL(SERIAL ASCENDING)`.

field
    specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr
    specifies control information for the preceding sort field.

    `ASCENDING`|`DESCENDING`
        specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT
    specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

limit
    specify a number between 1 and 999999.

NOLOG

specifies that ExLM does not issue message `LCM2317`.

Usage

Use the `ACTION MOVE` statement to move selected Nearline volumes.

Examples

Figure 57 shows an example of an `ACTION MOVE` statement to move all volumes selected for eject to an Extended Store LSM for later eject.

```
Action

  Move                              // When condition met, Move

* Move to Extended Store for Later Eject// Comment describing Action

  When(                             // Start Action condition

  (InLSM EQ True )                  // Volume is in a LSM

  and                               // And also meets next condition

  (VTV EQ False)                    // Not a Virtual Volume

  and                               // And also meets next condition

  (MethodName EQ 'Eject')           // Eject set as Method for Volume

  )// End When Condition

  To(ØØ:Ø5)                         // Move volumes to ØØ:Ø5

  ;              // End of Action statement
```

Figure 57. ACTION MOVE Statement: move all volumes selected for eject to an Extended Store LSM for later eject

Figure 58 shows an example of an `ACTION MOVE` statement to force HSC to initiate errant volume recovery for all errant volumes.

```
Action

  Move                             // When condition met, Move

* Force Errant Recovery// Comment describing Action

  When(                           // Start Action condition

  (InLSM EQ True)                  // Volume is in a LSM

  and                             // And also meets next condition

  (VTV EQ False                    // Not a Virtual Volume

   and                            // And also meets next condition

  (Errant EQ True)                 // HSC indicates volume is errant

    )                             // End When Condition

  To(ØØ:ØØ)                       // Move volumes to ØØØ

  ;                               // End of Action statement
```

Figure 58. ACTION MOVE Statement: force HSC to initiate errant volume recovery for all errant volumes

ACTION RECALL

The `ACTION RECALL` statement recalls migrated VTVs to a VTSS.

Syntax

Figure 59. ACTION RECALL Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"**" matches one or more data set qualifiers.

"*" matches one or more characters within a qualifier.

"%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*" matches one or more characters.

"%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD

the DD name of a file containing volsers for selection.

ddname

the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname

the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`, each volser start in column 1 on a new line. Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the `ACTION EJECT` statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

`VTSS`

specifies where the VTVs are recalled as follows:

- If you do not specify a VTSS (the default), VTCS recalls the VTVs to the VTSS of creation unless this VTSS does not have sufficient space. In this case, VTCS recalls the VTVs to the VTSS with the most available space.

- If you specify a single VTSS, VTCS attempts to recall the VTVs to the specified VTSS unless this VTSS does not have sufficient space. In this case, VTCS recalls the VTVs to the VTSS with the most available space.

- If you specify a list of VTVs, VTCS attempts to recall the VTVs to the VTSS of creation if it is on the list, otherwise VTCS recalls the VTVs to the VTSS with the most available space on the list.

vtss-name

A 1 to 8 character VTSS name.

CONTROL

specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:

`CONTROL(SERIAL ASCENDING).`

field

specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr

specifies control information for the preceding sort field.

`ASCENDING | DESCENDING`

specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT

specifies the maximum number of volumes processed by this `ACTION` statement. The limit is applied based on the sort order established by the `CONTROL` parameter.

limit
>   specify a number between 1 and 999999.

NOLOG
>   specifies that ExLM does not issue message `LCM2317`.

Usage

Use the `ACTION RECALL` statement to recall migrated VTVs.

Example

The following `ACTION RECALL` statement recalls VTVs that contain data sets with the name mask PAYR*.

`ACTION RECALL VTSS(VTSS01) WHEN(DSN EQ PAYR*);`

ACTION RECLAIM

The `ACTION RECLAIM` statement reclaims fragmented MVCs.

Syntax
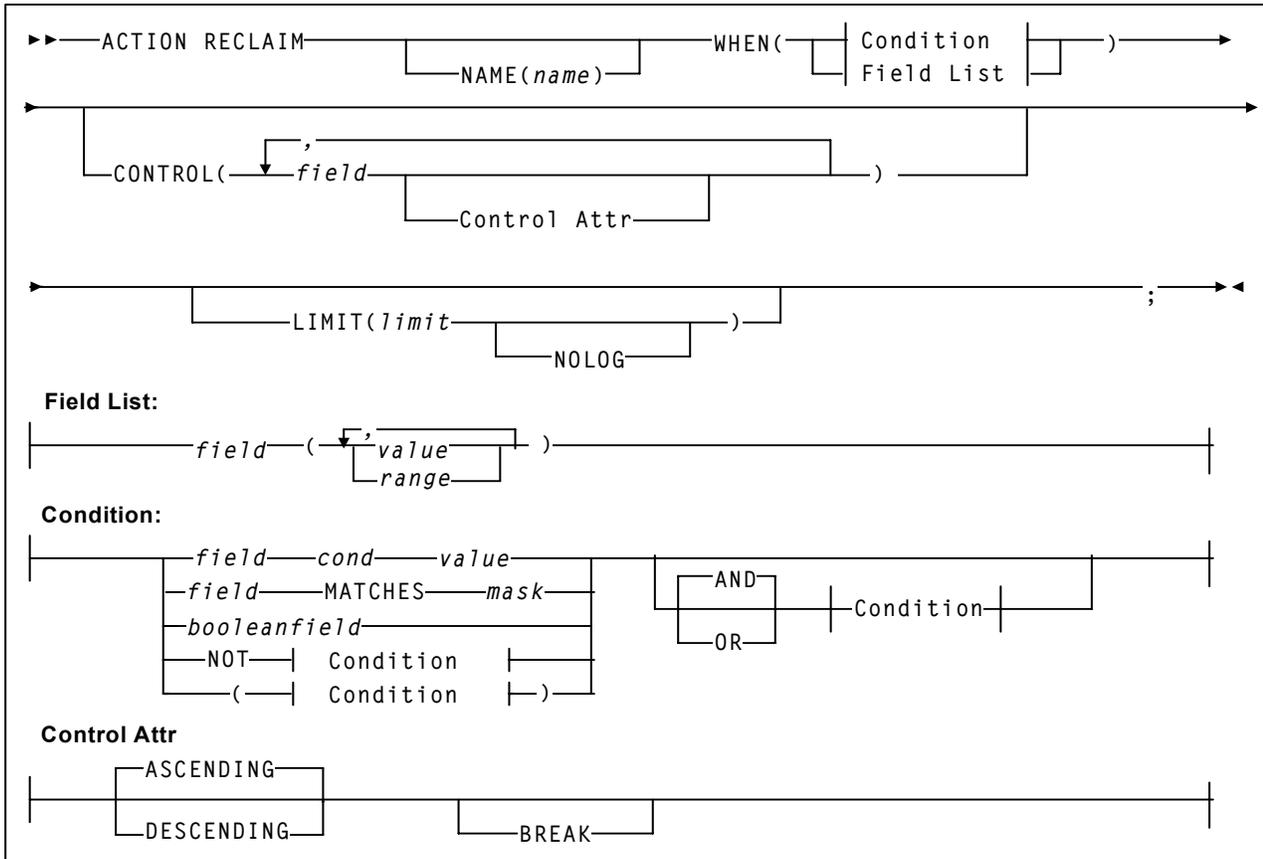
Figure 60. ACTION RECLAIM Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` ***mask***

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME, BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

"**" matches one or more data set qualifiers.

"*" matches one or more characters within a qualifier.

"%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

"*" matches one or more characters.

"%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

CONTROL

specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is: `CONTROL(SERIAL ASCENDING)`.

`field`

specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr

    specifies control information for the preceding sort field.

    ASCENDING | DESCENDING

        specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT

    specifies the maximum number of volumes processed by this ACTION statement. The limit is applied based on the sort order established by the CONTROL parameter.

limit

    specify a number between 1 and 999999.

NOLOG

    specifies that ExLM does not issue message LCM2317.

Usage

Use the ACTION RECLAIM statement to reclaim fragmented MVCs, optionally overriding the VTCS CONFIG RECLAIM settings for the THRSHLD, MAXMVC, and CONMVC parameters.

Example

The following ACTION RECLAIM statement reclaims MVCs in the LOCAL Storage Class:

```
ACTION NAME(RECLLOC) RECLAIM WHEN(MVCSTORCLAS EQ LOCAL);
```

ACTION SCRATCH

The `ACTION SCRATCH` statement scratches VTVs or Nearline volumes.
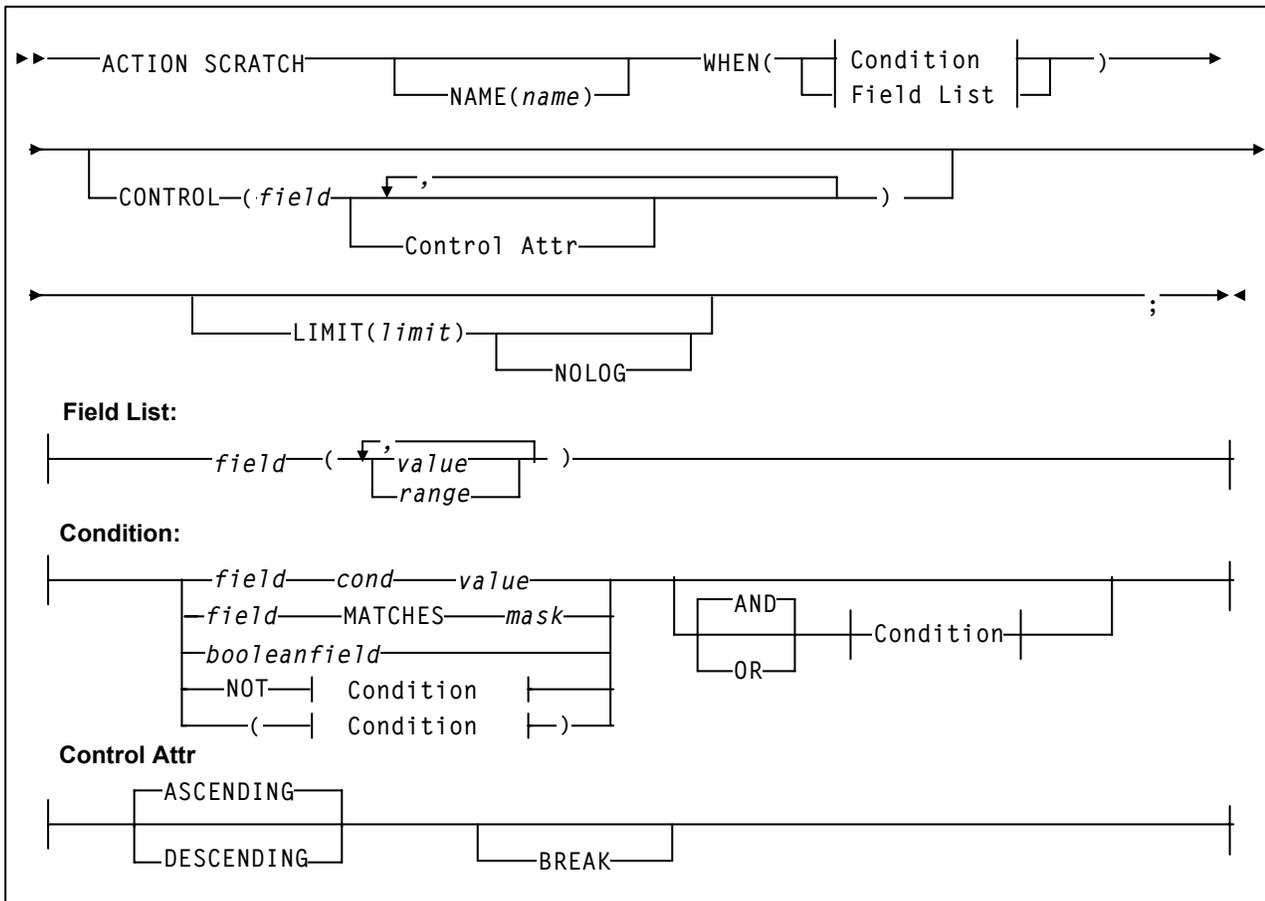
Syntax

Figure 61. ACTION SCRATCH Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- DATASETNAME, BASENAME: Specify a string in single quotes. Wildcards can be used as follows:

  "**" matches one or more data set qualifiers.

  "*" matches one or more characters within a qualifier.

  "%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "*" matches one or more characters.

  "%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield
  specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

  For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`
  reverses the condition that immediately follows the `NOT` keyword.

  For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`
  make the selection if both conditions are true.

  For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` that are **not** cleaning cartridges.

`OR`
  make the selection if either condition is true.

  For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

CONTROL
  specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:
  `CONTROL(SERIAL ASCENDING)`.

field
>> specifies a sort field. The same volume fields available for specifying WHEN conditions can also be specified on the CONTROL parameter.

attr
>> specifies control information for the preceding sort field.

>> ASCENDING | DESCENDING
>>> specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT
> specifies the maximum number of volumes processed by this ACTION statement. The limit is applied based on the sort order established by the CONTROL parameter.

limit
>> specify a number between 1 and 999999.

NOLOG
>> specifies that ExLM does not issue message LCM2317.

Usage

Use the ACTION SCRATCH statement to scratch VTVs or Nearline volumes.

Example

The following ACTION SCRATCH statement scratches volsers V0001 - V0009:

```
ACTION SCRATCH VOLSER(V0001-V0009);
```

ACTION UNSCRATCH

The `ACTION UNSCRATCH` statement unscratches VTVs or Nearline volumes.

Syntax

```
►►──ACTION UNSCRATCH──────────────────────────WHEN(──┬─ Condition ─┬──)──────►
                        └─NAME(name)─┘               └─ Field List ─┘

►──────────────────────────────────────────────────────────────────────────►
     └─CONTROL──(·field──┬──────────┬─────────────)──┘
                         │    ┌─,─┐  │
                         └─Control Attr─┘

►──────────────────────────────────────────────────────────────────;──►◄
     └─LIMIT(limit)─┬────────────┬─┘
                    └─NOLOG─┘
```

Field List:
```
├──field──(──┬─value─┬──)──────────────────────────┤
             │  ┌─,─┐ │
             └─range─┘
```

Condition:
```
├──┬─field────cond────value───────┬──┬─────────────────────┬──┤
   ├─field────MATCHES────mask──────┤  │  ┌─AND─┐            │
   ├─booleanfield───────────────────┤  └──┼─────┼──Condition─┘
   ├─NOT──┤ Condition ├─────────────┤     └─OR──┘
   └─(──┤ Condition ├──)────────────┘
```

Control Attr
```
├──┬─ASCENDING──┬──┬──────────┬──┤
   └─DESCENDING─┘  └─BREAK─┘
```
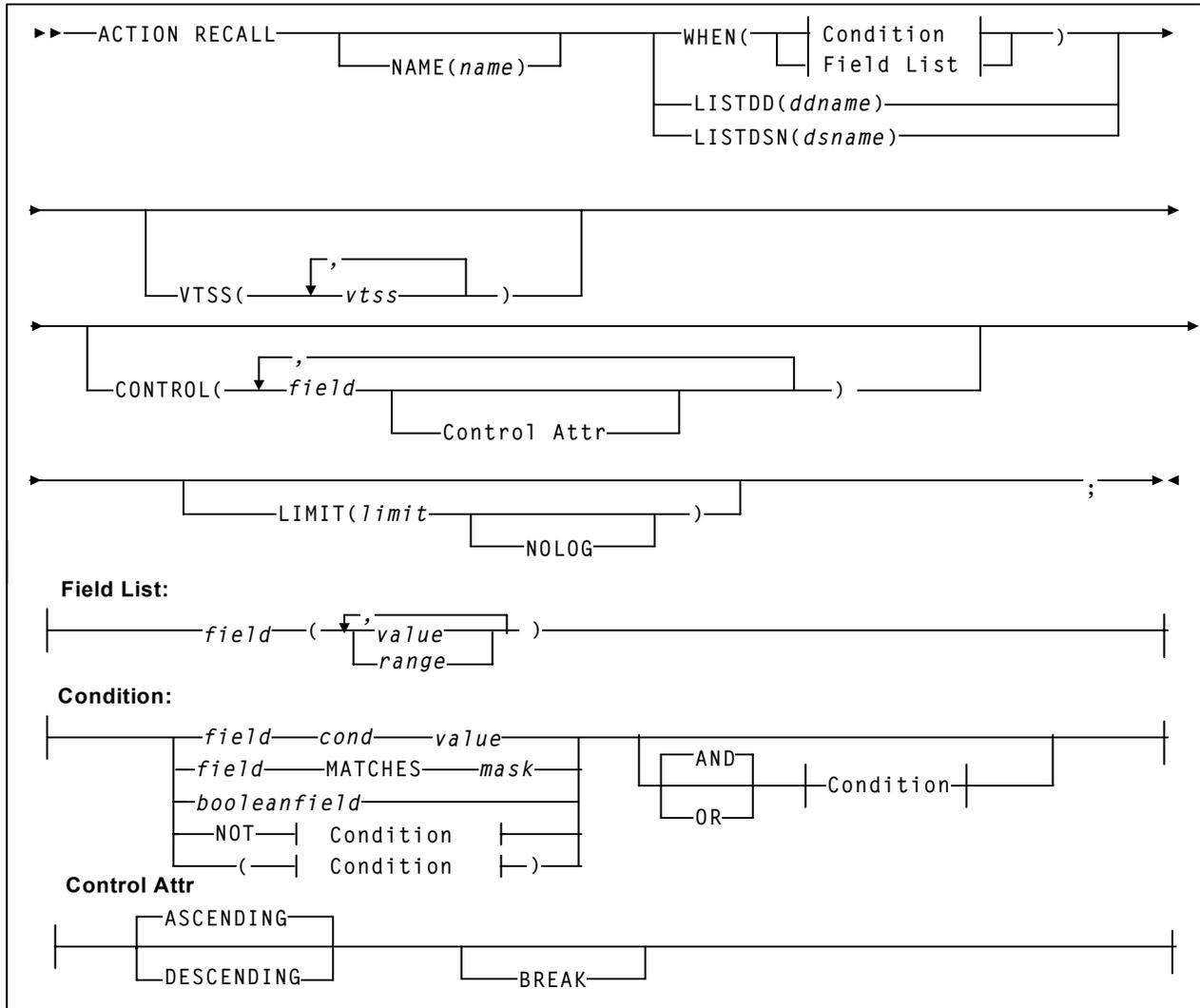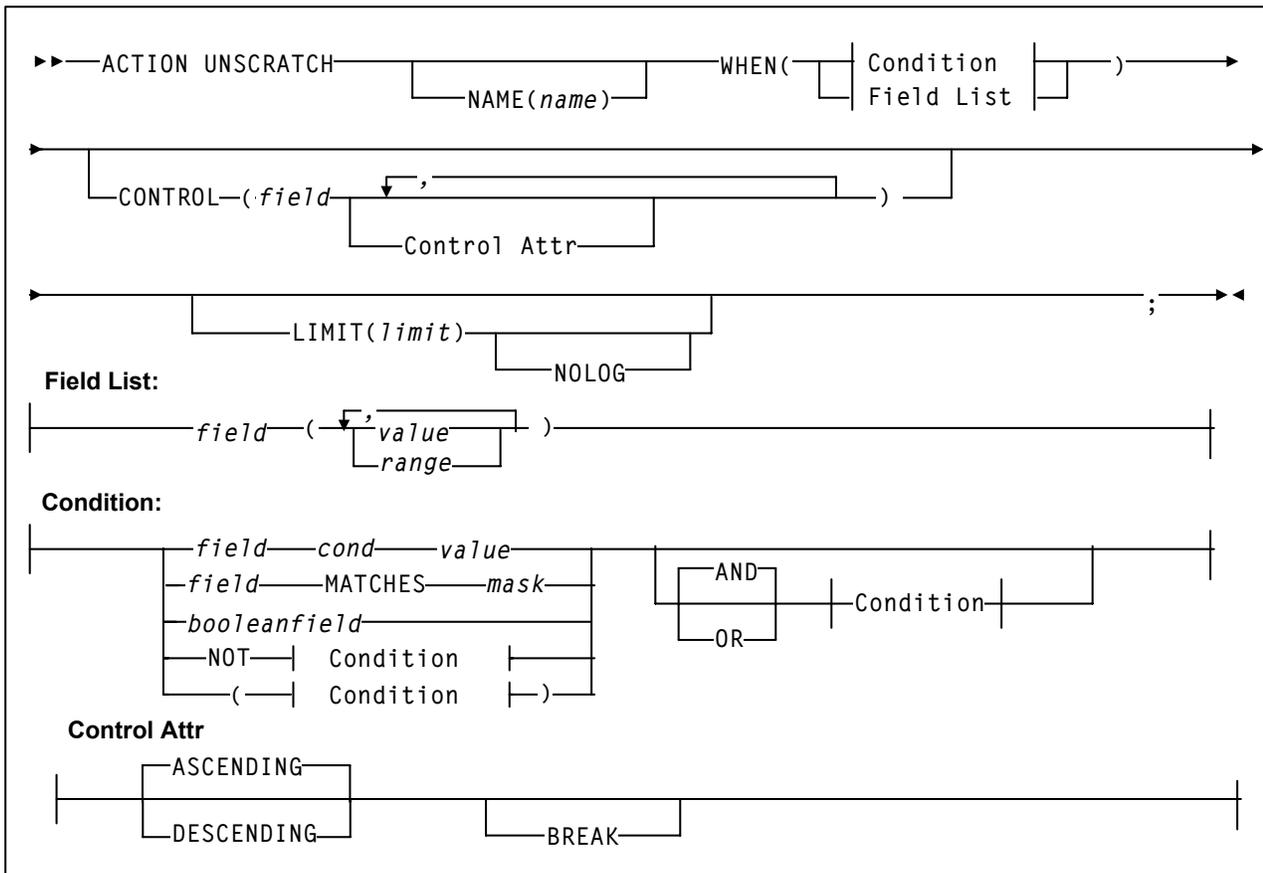
Figure 62. ACTION UNSCRATCH Statement Syntax

Parameters

NAME

specifies a unique name for this `ACTION` statement. The specified name appears in the `Reason` column of reports for volumes processed by this `ACTION` statement.

name

the 1 to 10 character name. The default is `Action` followed by the number of the `ACTION` statement.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME,BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

  "**" matches one or more data set qualifiers.

  "*" matches one or more characters within a qualifier.

  "%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "*" matches one or more characters.

  "%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield
specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`
reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`
make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` that are **not** cleaning cartridges.

`OR`
make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes `A00500` through `A00750` **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

CONTROL
specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:
`CONTROL(SERIAL ASCENDING)`.

field
> specifies a sort field. The same volume fields available for specifying WHEN conditions can also be specified on the CONTROL parameter.

attr
> specifies control information for the preceding sort field.

> ASCENDING | DESCENDING
> > specifies whether to process the selected volumes in ascending or descending volser order.

LIMIT
> specifies the maximum number of volumes processed by this ACTION statement. The limit is applied based on the sort order established by the CONTROL parameter.

limit
> specify a number between 1 and 999999.

NOLOG
> specifies that ExLM does not issue message LCM2317.

Usage

Use the ACTION UNSCRATCH statement to unscratch VTVs or Nearline volumes.

Example

The following ACTION UNSCRATCH statement unscratches volsers V0001 - V0009:

```
ACTION UNSCRATCH VOLSER(V0001-V0009);
```

Chapter 6. ExLM Reports Control Statements

ExLM provides the following types of reports:

- "Standard Reports" on page 246
- "Optional Reports" on page 296
- "Custom Reports" on page 317

Standard Reports

ExLM automatically generates fixed-content Standard Reports unless suppressed via the `OPTIONS SUPAUTORPT` parameter. Standard Reports include the following:

REPORT CELLCNT

The `REPORT CELLCNT` statement specifies options for a Cell Count Report.

Syntax
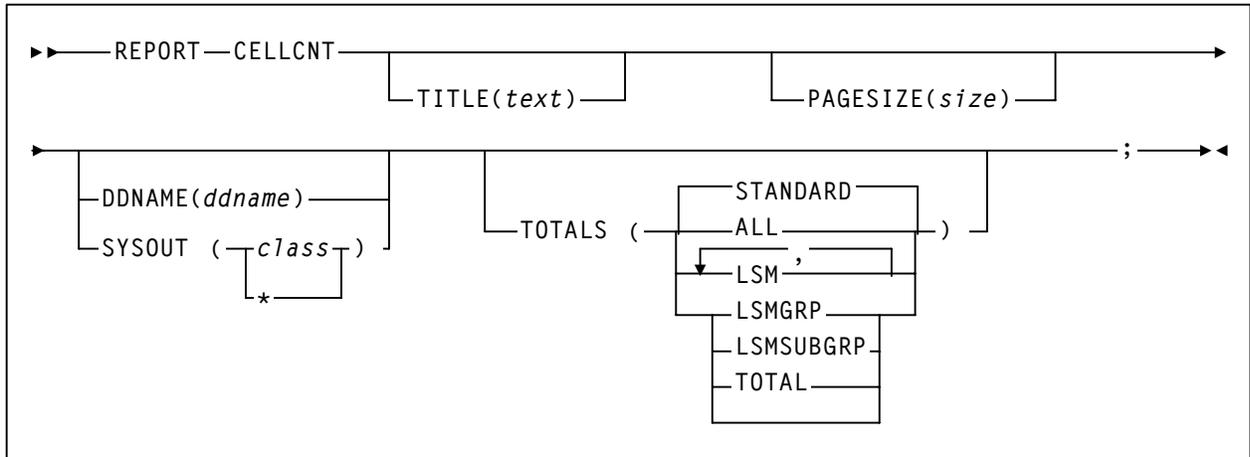
Figure 63. REPORT CELLCNT Statement Syntax

Parameters

Table 34 lists the valid abbreviations for the `REPORT CELLCNT` statement. `TITLE`

Table 34. REPORT CELLCNT Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
CELLCNT	CC
DDNAME	DD,DDN

specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

If you do not specify `TITLE`, the title is "Cell Count Report".

text
the title, which is a maximum of 70 characters.

`PAGESIZE`
specifies the maximum lines per page for printing the report.

size
the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

Note: You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
specifies the ddname where ExLM writes the report.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

ddname
the ddname.

`SYSOUT`
specifies that ExLM writes the report to the specified `SYSOUT` class.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

`TOTALS`

specifies the type of total lines for the Cell Count Report.

If you do not specify the `TOTALS` parameter, the default is `STANDARD`.

`ALL`

all types of totals.

`LSM`

totals for each LSM.

`LSMGRP`

totals for each LSM group.

`LSMSUBGRP`

totals for each LSM subgroup.

`STANDARD`

ExLM selects totals.

`TOTAL`

grand totals.

Usage

Use the `REPORT CELLCNT` statement to specify options for a Cell Count Report, which displays cells and volume information for each LSM that ExLM manages.

Cell Count Report

Figure 64 shows an example of a Cell Count Report.

```
2002-07-04              STORAGE TECHNOLOGY CORPORATION -                              PAGE 5
13:37:07                ExLM 6.2.0


                             Daily Vaulting Run


                             Cell Count Report                                       CELLCN
                                                                                     T




Projected     -Free  -Scratc-CLN    ---- Not      ---- Pickable by Order ----- -Misc -Froz -Total
Cell Use:     Cells-    h-    -     Pickable ----                               -     en-    -


                Init  Proj    Proj  Proj  Held  NEJ   Ignore  1-20  21-40  41-60  61-80  81-100      Empty

```

Figure 64. Cell Count Report

The following list describes the Cell Count Report fields.

Free Cells
    the initial and projected number of free cells.

Scratch
    the projected number of scratch volumes.

CLN
    the projected number of cleaning cartridges.

Not Pickable
    the projected number of volumes that are ineligible for ejection or demotion after this ExLM run, based on the supplied parameter file, for one of the following reasons:

Held
    volumes that have the EJECT(ASNEEDED) management attribute but are not eligible for ejection because they:

- will cycle soon or have already expired,

- have been referenced in less days than specified by the MINREF option,

- were entered more recently than specified by the MINENTER option, or

- were on a pull list.

These volumes can be demoted if they are not already at the bottom of an LSM group hierarchy, but cannot be ejected by ExLM during this run

NEJ
ExLM cannot demote or eject these volumes during this run because they have the:

- `EJECT(NO)` management attribute and are in an LSM group at the bottom of an LSM group hierarchy, or

- `LSMGRP` and `EJECT(NO)` management attributes.

Ignore
ExLM cannot eject or demote these volumes during this run because they belong to a subpool that is being ignored as specified by the `IGNORE` keyword on a `SUBPOOL` statement.

Pickable by Order
the projected number of volumes that are pickable for ejection or demotion after this ExLM run, based on the supplied parameter file. The counts are broken down into ranges by pick order, which is determined by the `ORDER` attribute of a management method; for more information, see "METHOD" on page 117.

Misc
the projected number of volumes that do not fit in any of the other columns on this report. This field includes BadScratch volumes and cleaning cartridges HSC has marked not usable.

Frozen Empty
the projected number of empty cells on frozen panels. ExLM does not consider these free cells because they are not available for use.

Total Cells
the total number of cells.

REPORT CONSOLIDATE

The `REPORT CONSOLIDATE` statement specifies options for a Consolidation Report. If an automatic Consolidation Report is printed, it uses the default options.

Syntax

```
►►──── REPORT ──── CONSOLIDATE ──────────────────────────────────────────────────►
                                    └─ TITLE(text) ─┘        └─ PAGESIZE(size) ─┘


    ──┬─ DDNAME(ddname) ─┬──────────────────────────────────────────────── ; ─►◄
      └─ SYSOUT (─┬─class─┬─)─┘      └─ NORECMSG(text) ─┘
                  └─ * ──┘
```
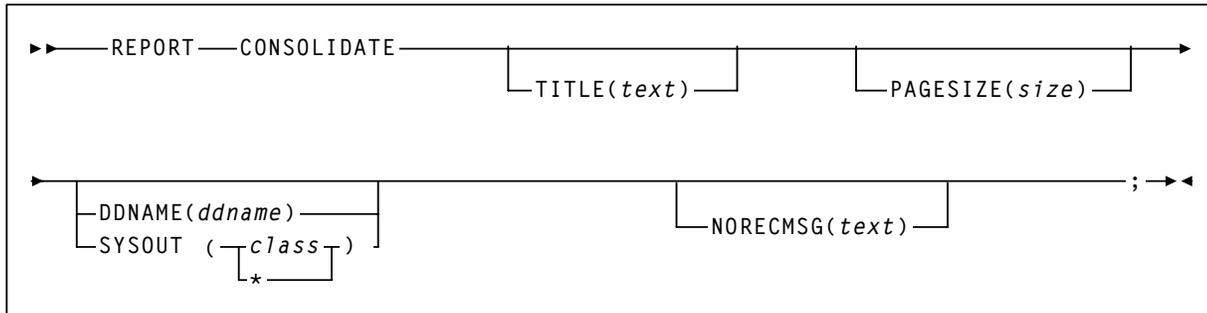
Figure 65. REPORT CONSOLIDATE Statement Syntax

Parameters

Table 35 lists the valid abbreviations for the `REPORT CONSOLIDATE` statement.

Table 35. REPORT CONSOLIDATE Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
CONSOLIDATE	CONS
DDNAME	DD,DDN

`TITLE`
> specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
> If you do not specify `TITLE`, the title is "Cell Count Report".
>
> ***text***
> > the title, which is a maximum of 70 characters.

`PAGESIZE`
> specifies the maximum lines per page for printing the report.
>
> ***size***
> > the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
> >
> > **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
> specifies the ddname where ExLM writes the report.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
> ***ddname***
> > the ddname.

`SYSOUT`
> specifies that ExLM writes the report to the specified `SYSOUT` class.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

NORECMSG

specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

Note: If you explicitly code a statement for this report, it is **always** printed, even if there are no records to print.

Usage

Use the `REPORT CONSOLIDATE` statement to specify options for a Consolidation Report, which displays volume and method information for VTV consolidations.

Consolidation Report

Figure 66 shows an example Consolidation Report.

```
2002-06-03                          STORAGE TECHNOLOGY CORPORATION - ExLM          PAGE 3
13:37:22                            6.2.0

                                    ExLM Daily Run

Consolidation Group CONSGRP1         Consolidation Report                     CONSOLIDATE


VTV      Method Reason     VTV     Method Reason     VTV      Method Reason

H01356 Action Action/8  C02569 Cons1  Location  C02248 Cons1   Location

A00159 Action Action/8  C02688 Cons2  Location  C02689 Cons1   Location

A00287 Action Action/8  C02727 Cons2  Location  C02244 Cons2   Location

*A00541Cons3  Set        C02965 Cons2  Location  C02748 Cons2   Location
              Method

A01117 Cons3  Set        C03127 Cons2  Location  C02008 Cons2   Location
```

Figure 66. Consolidation Report

The following list describes the Consolidation Report fields.

Consolidation Group
> The Consolidation Group name specified on the `METHOD` statement `CONSOLIDATE` parameter or `ACTION CONSOLIDATE` statement `GROUP` parameter.

VTV
> the volser of a VTV in the Consolidation Group.

> An asterisk (*) denotes volumes that start a new Consolidation Group. ExLM begins a new Consolidation Group for a new `ACTION` statement, an `ACTION` statement control break, and when ExLM starts processing consolidations assigned by management methods.

Method
> the management method assigned to the VTV. If the method has conditions, the method name is followed by a slash (/) and the number of the condition that applies.

Reason
> the reason ExLM assigned the management method to the VTV.

Note: If a volume is consolidated by an `ACTION CONSOLIDATE` statement, the `Method` column is `ACTION` and the `Reason` column is the `ACTION` statement name. In Figure 66, the first 3 volumes were selected for consolidation by the eighth `ACTION` statement in the ExLM parameter file.

REPORT EJECT

The `REPORT EJECT` statement specifies options for an Eject Report. If an automatic Eject Report is printed, it uses the default options.

Syntax

```
►►──── REPORT ──── EJECT ─────────────────────────────────────────────────────►
                                  └─ TITLE(text) ─┘      └─ PAGESIZE(size) ─┘

 ►─────────────────────────────────────────────────────────────────── ; ─►◄
     ├─ DDNAME(ddname) ─┤          └─ NORECMSG(text) ─┘
     └─ SYSOUT (─┬─class─┬─) ─┘
                 └─ * ───┘
```
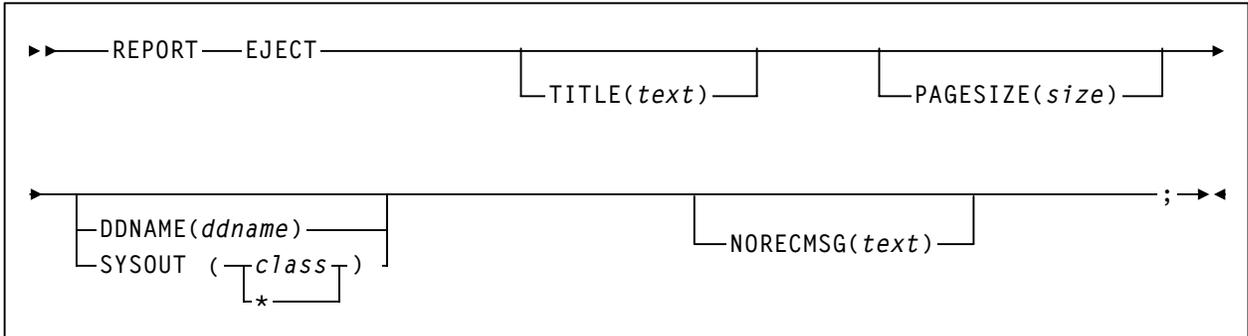
Figure 67. REPORT EJECT Statement Syntax

Parameters

Table 36 lists the valid abbreviations for the `REPORT EJECT` statement.

Table 36. REPORT EJECT Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
EJECT	EJ
DDNAME	DD,DDN

`TITLE`

specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

If you do not specify `TITLE`, the title is "Cell Count Report".

text

the title, which is a maximum of 70 characters.

`PAGESIZE`

specifies the maximum lines per page for printing the report.

size

the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

Note: You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`

specifies the ddname where ExLM writes the report.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

ddname

the ddname.

`SYSOUT`

specifies that ExLM writes the report to the specified `SYSOUT` class.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for
the job.

NORECMSG

specifies the text to print if no records are printed on the report. The specified text
prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default
text is 'No records to print for this report.'

Note: If you explicitly code a statement for this report, it is **always** printed, even if
there are no records to print.

Usage

Use the `REPORT EJECT` statement to specify options for an Eject Report. The Eject Report
lists all volumes that ExLM plans to eject through the specified LSM even if the volumes
do not currently reside in that LSM.

Hint: Note that:

- The `LOCATION SLOTS | NOSLOTS` parameter specifies whether ExLM requests ejects
  in volser or slot order; for more information, see "LOCATION" on page 103.

- The `OPTIONS` statement specifies global CAP a.nd eject options; for more
  information, see "OPTIONS" on page 126.

- The `LOCATION` statement specifies CAP and eject options for volumes with a specific
  TMS location code. For more information, see "LOCATION" on page 103.

- You can use the ExLM `DISPLAY`, `PAUSE`, `REDIRECT`, and `RESUME` commands to manage
  ExLM activity for specific CAPs; for more information, see:

  - "DISPLAY" on page 349
  - "PAUSE" on page 351
  - "REDIRECT" on page 353
  - "RESUME" on page 354

Eject Report

Figure 68 shows an example of an Eject Report.

```
2002-06-2                   STORAGE TECHNOLOGY CORPORATION - ExLM                PAGE 9
4                           6.2.0
07:37:21


                            ExLM Test Run


LSM 00:00 Zero              Eject Report                                         EJECT



Volume    Location  Slot      Method    Reason    Volume    Location  Slot      Method    Reason

H03736    Vault 1   123124    Action    Action/1  C03120    Vault 2   916       Offsite   Location

H04223    Vault 1   123125    Action    Action/1  *CODOCO   Local               Standard  Default

*H05323   Vault 1   123126    Offsite   Location  COD091    Local               Standard  Default
```

Figure 68. Eject Report

The following list describes the Eject Report fields.

`LSM`

the LSM from which the volumes will be ejected.

`Volume`

the volser.

An asterisk (*) denotes a CAP break. ExLM will cause a CAP break for a new `ACTION` statement, an `ACTION` statement control break, and when ExLM starts processing ejects for content management.You must empty the CAP door before a new eject request can begin.

Method

the management method assigned to the VTV. If the method has conditions, the method name is followed by a slash (/) and the number of the condition that applies.

Reason

the reason ExLM assigned the management method to the VTV.

Note: If a volume is ejected by an `ACTION EJECT` statement, the `Method` column is `ACTION` and the `Reason` column is the `ACTION` statement name. In Figure 68, the first two volumes were selected for ejection by the first `ACTION` statement in the ExLM parameter file.

`Location`

the location name for the volume.

Slot
the slot number assigned to the volume by the TMS. This field is blank if slot numbers have not been assigned for this location or if the `LOCATION NOSLOTS` parameter is specified; for more information, see "LOCATION" on page 103.

Method
the management method assigned to the volume. If the method has conditions, the method is followed by a slash (/) and the number of the `COND` that applies.

Reason
the reason the management method was assigned to the volume.

REPORT ENTER

The `REPORT ENTER` statement specifies options for an Enter Report. If an automatic Enter Report is printed, it uses the default options.

Syntax

```
►►──── REPORT ──── ENTER ──────────────────────────────────────────────────────►
                              └─TITLE(text)─┘        └─PAGESIZE(size)─┘

►──┬─DDNAME(ddname)───────┬──────────┬─NORECMSG(text)─┬──────────────── ; ─►◄
   └─SYSOUT (─┬─class─┬─) ─┘
             └──*───┘
```
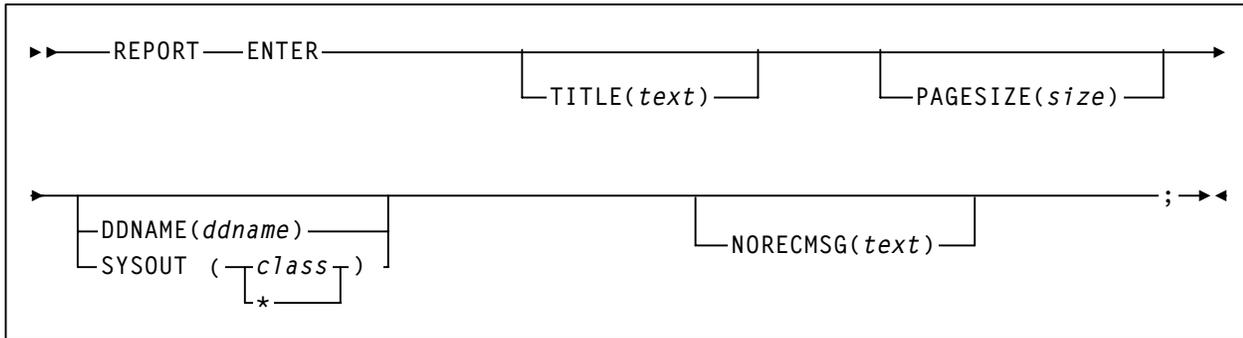
Figure 69. REPORT ENTER Statement Syntax

Parameters

Table 37 lists the valid abbreviations for the `REPORT ENTER` statement.

Table 37. REPORT ENTER Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
ENTER	EN
DDNAME	DD,DDN

`TITLE`
>   specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
>   If you do not specify `TITLE`, the title is "Cell Count Report".
>
>   ***text***
>   >   the title, which is a maximum of 70 characters.

`PAGESIZE`
>   specifies the maximum lines per page for printing the report.
>
>   ***size***
>   >   the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
>   >
>   >   **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
>   specifies the ddname where ExLM writes the report.
>
>   `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
>   ***ddname***
>   >   the ddname.

`SYSOUT`
>   specifies that ExLM writes the report to the specified `SYSOUT` class.
>
>   `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

NORECMSG

specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

Usage

Use the `REPORT ENTER` statement to specify options for an Enter Report.   ExLM creates an Enter Report for each LSM that needs volumes to be entered. If you specify the `OPTIONS PICKSCR` parameter, the Enter Report can include scratch volumes. The Enter Report lists nonscratch volumes if required by a `PULLLIST` statement. The report lists volumes in ascending order by location, slot and volume serial number.

If the ExLM parameter file contains scratch criteria on the `MANAGE PHYSICAL` statement and also specifies `OPTIONS PICKSCR`, you should check the Scratch Counts Report or the Operator Report to determine whether more scratch volumes should be entered than are listed in the Enter Report; for more information, see "REPORT SCRCNT" on page 286 and "REPORT OPERATOR" on page 279.

Hint: The `PULLLIST` statement specifies a list of volumes that an operator must enter for an upcoming production run; for more information, see "The ExLM Eject Utility" on page 367.

Enter Report

Figure 70 shows an example of an Enter Report.

```
2002-06-2                    STORAGE TECHNOLOGY CORPORATION - ExLM              PAGE 8
4                            6.2.0
07:37:21


                             ExLM Daily Run


LSM 00:00 Zero               Enter Report                                       ENTER



Volume   Location  Slot     Volume    Location  Slot       Volume   Location  Slot


A07782                       A07832                         A07882

A07783                       A07833    Vault 1   12811      A07883

A07784                       A07834    Vault 1   12812      A07884

A07785                       A07835    Vault 1   12813      A07885

A07786                       A07836    Vault 1   12814      A07886
```

Figure 70. Enter Report

The following list describes the Enter Report fields.

LSM
: the LSM into which the volumes should be entered.

Volume
: the volser.

Location

: the location name for the volume.

Slot
: the slot number assigned to the volume by the TMS. This field is blank if slot numbers have not been assigned for this location or if the LOCATION NOSLOTS parameter is specified; for more information, see "LOCATION" on page 103.

REPORT EXPORT

The `REPORT EXPORT` statement specifies options for an Export Report. If an automatic Export Report is printed, it uses the default options.

Syntax

```
►►──REPORT──EXPORT──────────────────────────────────────────────────────►
                           └─TITLE(text)─┘        └─PAGESIZE(size)─┘

►──┬─DDNAME(ddname)─────┬────────────────────────────────────;─►◄
   └─SYSOUT (─┬─class─┬─)─┘      └─NORECMSG(text)─┘
             └─*─────┘
```
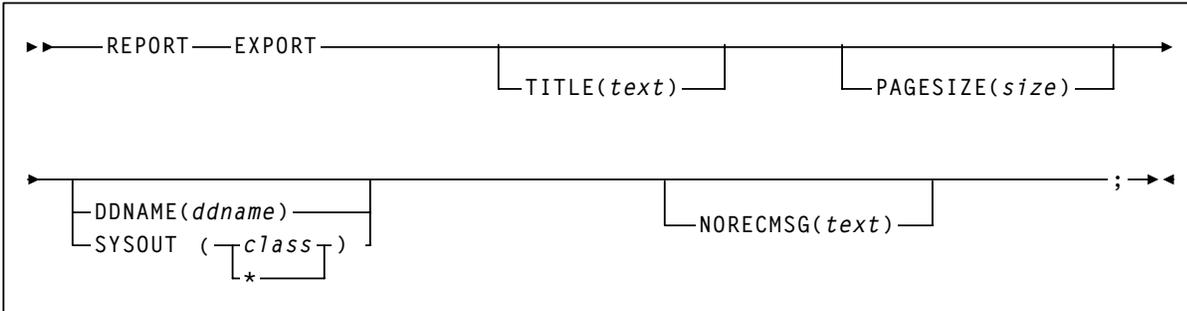
Figure 71. REPORT ENTER Statement Syntax

Parameters

Table 37 lists the valid abbreviations for the `REPORT ENTER` statement.

Table 38. REPORT ENTER Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
EXPORT	EX
DDNAME	DD,DDN

`TITLE`
> specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
> If you do not specify `TITLE`, the title is "Cell Count Report".
>
> ***text***
> > the title, which is a maximum of 70 characters.

`PAGESIZE`
> specifies the maximum lines per page for printing the report.
>
> ***size***
> > the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
> >
> > **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
> specifies the ddname where ExLM writes the report.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
> ***ddname***
> > the ddname.

`SYSOUT`
> specifies that ExLM writes the report to the specified `SYSOUT` class.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

> the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

NORECMSG

> specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

> specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

> **Note:** For ExLM 5.1 and above, if you explicitly code a statement for this report, it is **always** printed, even if there are no records to print.

Usage

This report is based on the export operations ExLM plans to perform. If ExLM is stopped prematurely or is unable to perform some actions, the actual results may differ from those reported here.

This report is produced before any exports are actually performed. To print the report while ExLM is still active, specify FREE=CLOSE on the associated DD statement.

The following example shows how to use two REPORT statements to produce two Export reports. One report is sent to a dynamically allocated SYSOUT file and the other is sent to DD OPER.

```
report export;                    // Report for records.
report export                     // Report for operator.
    title('Export Report')
    ddname(oper)
    sysout(a) ;
```

To produce a post-action report that lists virtual tape volumes that were successfully exported, you can code a Report Volume statement similar to the following example:

```
report volume
    when(action=Export and
        actionstatus=action successfully performed)
    column(volser,method,methodreason,vtvmvcid1,vtvmvcid2,vtvvtss);
```

ExLM creates an Export report for each `REPORT` statement with type EXPORT coded. This report can also be produced automatically. See "SUPAUTORPT" on page 129 for details.

Export reports are written to the ddname specified on the associated `REPORT` statement. If no DDNAME is specified, ExLM writes the report to a dynamically allocated SYSOUT file.

ExLM will not create Export reports while in the SCAN execution modes.

Note: If ExLM is stopped before the report completes, or ExLM is unable to perform some actions, not all volumes listed will be exported. The ExLM log, LCMLOG, will contain messages describing actions performed and, when appropriate, why actions were not completed.

Export Report

Figure 72 shows an example of an Export Report.

```
2003-09-1              STORAGE TECHNOLOGY CORPORATION - ExLM
5                      6.2.0
15:06:28


LCMMJM1.SYSBACK.MANIFEST                                  Export Report

                                    EXPORT

Action statement: Action1.


MVC       VTV                      MVC       VTV

W00957    C07431                   W01104    C07432

W00957    C08328                             C08450

          C08933

          C08923

          C08309
```

Figure 72. Export Report

The following list describes the Export Report fields.

MVC

> the MVC used for exported VTVs.
>
> The MVC volume serial applies to VTVs in the same column until a new MVC serial is printed.

VTV

> the VTV exported to the current MVC.

REPORT MIGRATE

The REPORT MIGRATE statement specifies options for a Migration Report. If an automatic Migration Report is printed, it uses the default options.

Syntax

Figure 73. REPORT MIGRATE Statement Syntax

Parameters

Table 39 lists the valid abbreviations for the `REPORT MIGRATE` statement.

Table 39. REPORT MIGRATE Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
DDNAME	DD,DDN

`TITLE`

>   specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
>   If you do not specify `TITLE`, the title is "Cell Count Report".
>
>   ***text***
>
>   >   the title, which is a maximum of 70 characters.

`PAGESIZE`

>   specifies the maximum lines per page for printing the report.
>
>   ***size***
>
>   >   the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
>   >
>   >   **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`

>   specifies the ddname where ExLM writes the report.
>
>   `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
>   ***ddname***
>
>   >   the ddname.

`SYSOUT`

>   specifies that ExLM writes the report to the specified `SYSOUT` class.
>
>   `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
>   ***class***
>
>   >   the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

NORECMSG

specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

Note: If you explicitly code a statement for this report, it is **always** printed, even if there are no records to print.

Usage

Use the `REPORT MIGRATE` statement to specify options for a Migration Report, which describes the migrations ExLM will perform. If ExLM stops prematurely or cannot perform all migrations, your mileage may vary from the Migration Report. This report is produced before any migrations occur, so if you want the report to print while ExLM is still active, specify FREE=CLOSE on the associated DD statement.

To produce a post-action report that lists the VTVs that were successfully migrated, create a `REPORT MIGRATE` statement such as the following:

```
report migrate

  when(action='Migrate' and

       actionstatus='action successfully performed')

  column(volser,method,methodreason,vtvmvcid1,vtvmvcid2,vtvvtss);
```

Migration Report

Figure 74 shows an example of an Migration Report.

```
2002-06-2                    STORAGE TECHNOLOGY CORPORATION - ExLM                PAGE 3
4                            6.2.0
07:37:21


                             ExLM Daily Run


                             Migration Report                                   MIGRATE



VTV       Method   Reason    VTV       Method   Reason    VTV       Method   Reason


C07782             Migrate1 C07832              Migrate2 C07882    MIG1     LOCATION

C07783             Migrate1 C07833              Migrate2 C07883    MIG1     LOCATION

C07784    MIG2     SetMethod C07834   MIG3     LOCATION C07884    MIG2     LOCATION

C07785    MIG2     SetMethod C07835   MIG3     LOCATION C07885    MIG2     LOCATION

C07786    MIG3     SetMethod C07836   MIG3     LOCATION C07886    MIG3     LOCATION
```
Figure 74. Migration Report

The following list describes the Migration Report fields.

`VTV`
> the VTV volser.

`Method`

> the management method assigned to the VTV. If the method had conditions, the method name is followed by a slash (/) and the number of the condition that applied.

Note: If a volume is migrated by an `ACTION MIGRATE` statement, the `Method` column is `ACTION` and the `Reason` column is the `ACTION` statement name.

`Reason`
> the reason the management method was assigned to the volume.

REPORT NONSCRCNT

The `REPORT NONSCRCNT` statement specifies options for a Nonscratch Count Report.
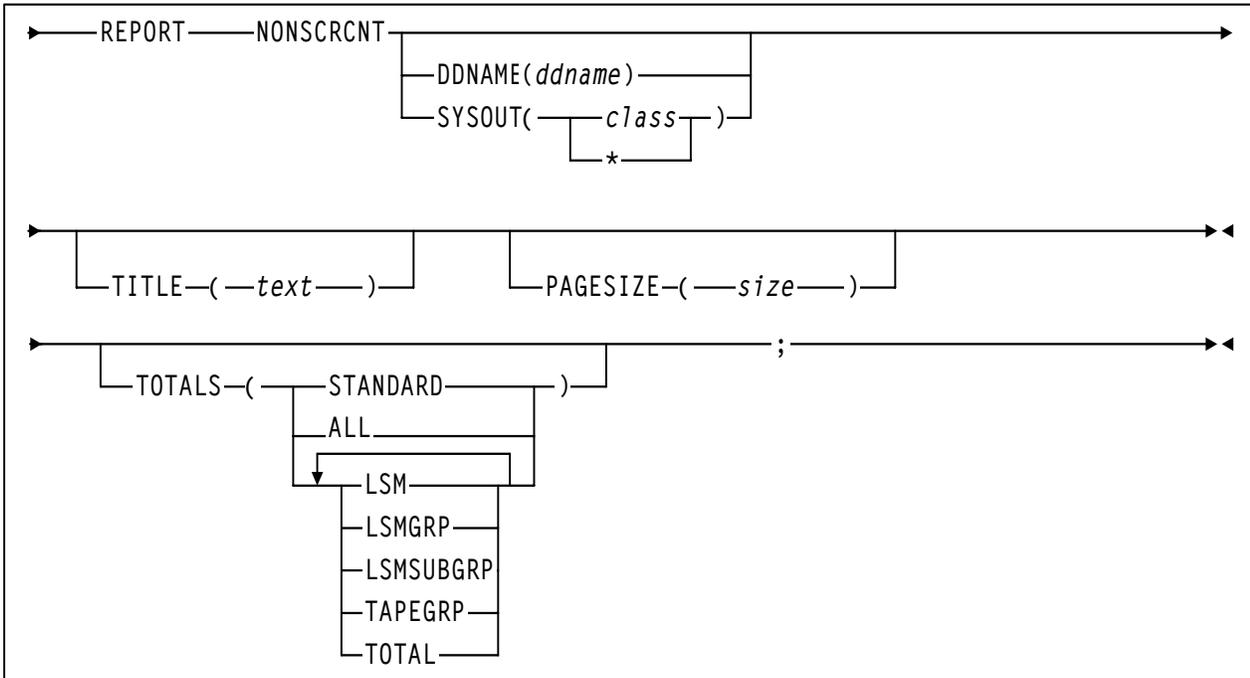
Syntax

Figure 75. REPORT NONSCRCNT Statement Syntax

Parameters

Table 40 lists the valid abbreviations for the `REPORT NONSCRCNT` statement.

Table 40. REPORT NONSCRCNT Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
NONSCRCNT	NSC
DDNAME	DD,DDN
STANDARD	STD
TAPEGRP	TG
TOTAL	TOT

`TITLE`

specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

If you do not specify `TITLE`, the title is "Cell Count Report".

text

the title, which is a maximum of 70 characters.

`PAGESIZE`

specifies the maximum lines per page for printing the report.

size

the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

Note: You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`

specifies the ddname where ExLM writes the report.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

ddname

the ddname.

SYSOUT

specifies that ExLM writes the report to the specified SYSOUT class.

DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

class

the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

TOTALS

specifies the type of total lines for the Nonscratch Counts Report.

If you do not specify the TOTALS parameter, the default is STANDARD.

ALL

all types of totals.

LSM

totals for each LSM.

LSMGRP

totals for each LSM group.

LSMSUBGRP

totals for each LSM subgroup.

STANDARD

ExLM selects totals.

TAPEGRP

totals for each tape group.

TOTAL

grand totals.

Usage

Use the REPORT NONSCRCNT statement to specify options for a Nonscratch Count Report.

Hint: Note that:

- The OPTIONS statement specifies global options that affect nonscratch volumes; for more information, see "OPTIONS" on page 126.

- The PULLLIST statement specifies a list of volumes that an operator must enter for an upcoming production run; for more information, see "The ExLM Eject Utility" on page 367.

Nonscratch Counts Reports

Figure 76 shows a Nonscratch Counts Report.

<pre>
2002-04-1   STORAGE TECHNOLOGY CORPORATION - ExLM 6.2.0   PAGE 4
7
14:28:08

                   ExLM Daily Run

                   Nonscratch Counts   NONSCRCNT
                   Report
</pre>

Tape Group	--Non-Scratch --		--Reference--		----Eject----		----Move In----		----Move Out----		-Enter-
	Init	Proj	Avg	Max	Always	Need	Always	Need	Always	Need	
Cleaning_Standard											
LSM 00:00	5	5	0	0	0	0	0	0	0	0	0
LSM 00:01	2	2	0	1	0	0	0	0	0	0	0
Tape Group	7	7	0	1	0	0	0	0	0	0	0
General											
LSM 00:00	106	106	199	897	0	0	0	0	0	0	0
LSM 00:01	105	105	411	942	0	0	0	0	0	0	0
Tape Group	211	211	304	942	0	0	0	0	0	0	0
Production											
LSM 00:00	2411	2206	12	1046	0	0	0	0	0	205	0
LSM 00:01	4545	4656	54	1589	0	94	0	205	0	0	0
Tape Group	6956	6862	48	1589	0	94	0	205	0	205	0

Figure 76. Nonscratch Counts Report

The following list describes the Nonscratch Counts Report fields.

Tape Group
> subpool name, followed by media type if this subpool is being managed by media type.

`Nonscratch`
> the initial and projected number of nonscratch volumes.

`Reference`
> the average and maximum days since last reference.

`Eject`
> the projected number of volumes that ExLM will eject. If you have specified on the `OPTIONS` or `LOCATION EJCAP` parameter, ExLM can eject some or all of these volumes through the CAP of a different LSM. For more information, see "OPTIONS" on page 126 and "LOCATION" on page 103.

> `Always`
>> the number of volumes being ejected due to an ACTION EJECT statement or because their assigned method indicates that they should always be ejected.

> `Need`
>> the number of volumes being ejected because additional cells are needed in order to meet NUMSCR or NUMFREE criteria, to accommodate clearing frozen panels, or to provide for entering pull list volumes. Their assigned method indicates that they can be ejected as needed.

`Move In`
> the projected number of volumes that will be moved in.

> `Always`
>> the number of volumes being moved in due to an ACTION MOVE statement or because their assigned method indicates that they belong in the LSM group.

> `Need`
>> the number of volumes being moved in because the LSM from which they are being moved is in need of additional room, or because ClearFrozenPanels was specified.

`Move Out`
> the projected number of volumes that will be moved out.

> `Always`
>> the number of volumes being moved out due to an ACTION MOVE statement or because their assigned method indicates that they belong in another LSM group.

> `Need`
>> the number of volumes being moved out because additional cells are needed in order to meet NUMSCR or NUMFREE criteria, to clear frozen panels, or to provide for entering pull list volumes.

`Enter`
> the projected number of volumes to be entered.

REPORT OPERATOR

The `REPORT OPERATOR` statement specifies options for an Operator Report.

Syntax

```
►──── REPORT OPERATOR ──────────────────────────────────────────────────►
                     ├─ DDNAME(ddname) ─────────┤
                     └─ SYSOUT( ─┬─ class ─┬─ ) ─┘
                                 └─ * ─────┘

►───┬──────────────────┬──────┬─────────────────────┬──── ; ────────►◄
    └─ TITLE(text) ─────┘      └─ PAGESIZE(size) ─────┘
```
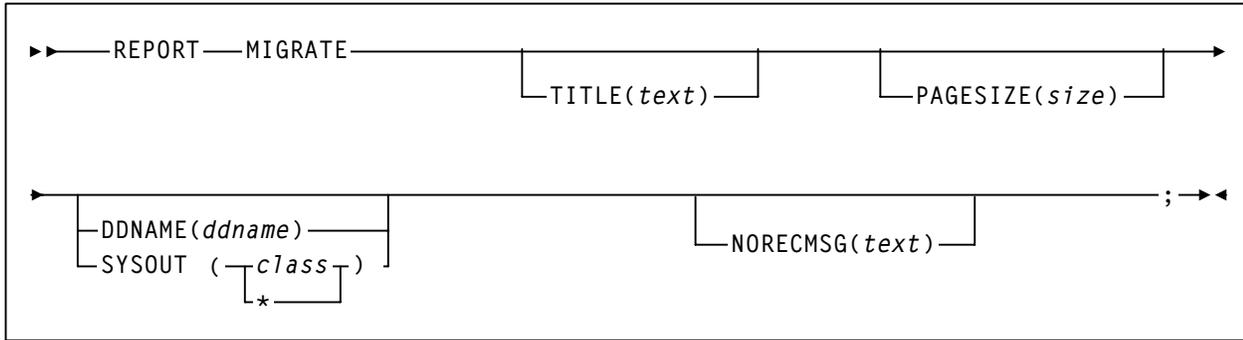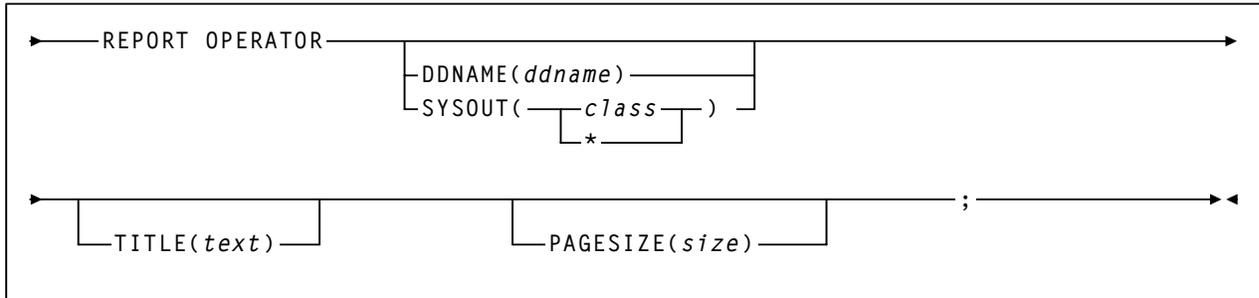
Figure 77. REPORT OPERATOR Statement Syntax

Parameters

Table 41 lists the valid abbreviations for the `REPORT OPERATOR` statement.

Table 41. REPORT OPERATOR Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
OPERATOR	OP
DDNAME	DD,DDN

`TITLE`
>
> specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
> If you do not specify `TITLE`, the title is "Cell Count Report".
>
> ***text***
> > the title, which is a maximum of 70 characters.

`PAGESIZE`
>
> specifies the maximum lines per page for printing the report.
>
> ***size***
> > the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
> >
> > **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
>
> specifies the ddname where ExLM writes the report.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
> ***ddname***
> > the ddname.

`SYSOUT`
>
> specifies that ExLM writes the report to the specified `SYSOUT` class.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

Usage

Use the REPORT OPERATOR statement to specify options for an Operator Report.

The Operator Report lists information and tells the operator what to do (enters and ejects, scratch synchronization runs, and so forth). The report is formatted like a checklist so the operator can check off completed items.

Hint: If the ExLM parameter file contains scratch criteria on the MANAGE PHYSICAL statement and also specifies OPTIONS PICKSCR, you should also check the Operator Report to determine whether more scratch volumes should be entered than are listed in the Enter Report; for more information, see "REPORT ENTER" on page 262.

Operator Report

Figure 78 shows an example of an Operator Report.

```
2002-03-17                    Storage Technology Corporation - ExLM 6.2.0         Page 2
13:37:07




                                                                          Operator
Report                                                                     OPERATOR




You can query the status of ExLM by entering the operator command:
F V01,D


ExLM will issue message LCM4016E and pause when it is ready to start
processing planned actions. When you are ready for ExLM to
continue, use the ExLM RESUME command.


When LCM4016E is displayed, issue operator command: F V01,R


ExLM will eject cartridges during this run.


ExLM will use the CAP doors of enhanced CAPs in parallel.


Each time a CAP door is unlocked, message SLS1251E will be issued
to help you determine how to process the ejected cartridges.


ExLM will move cartridges during this run.
```

Figure 78. Operator Report

REPORT RECALL

The `REPORT RECALL` statement specifies options for a Recall Report. If an automatic Export Report is printed, it uses the default options.

Syntax

```
►►──── REPORT ──── RECALL ─────────────────────────────────────────────────►
                              └─ TITLE(text) ─┘         └─ PAGESIZE(size) ─┘

►────────────────────────────────────────────────────────────────── ; ─►◄
    ┌─ DDNAME(ddname) ─┐                    ┌─ NORECMSG(text) ─┐
    └─ SYSOUT  (─┬─ class ─┬─) ─┘
                 └─ * ─────┘
```
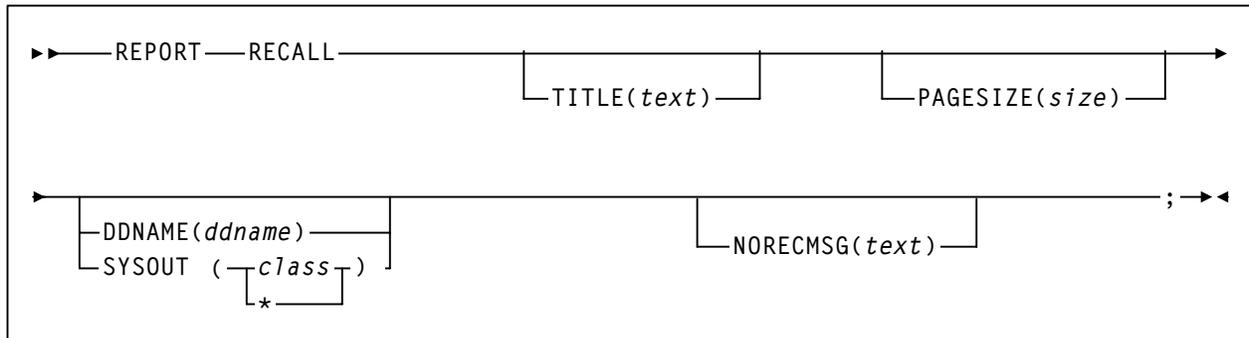
Figure 79. REPORT RECALL Statement Syntax

Parameters

Table 39 lists the valid abbreviations for the `REPORT RECALL` statement.

Table 42. REPORT RECALL Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
DDNAME	DD,DDN

TITLE
:   specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

    If you do not specify `TITLE`, the title is "Cell Count Report".

    text
    :   the title, which is a maximum of 70 characters.

PAGESIZE
:   specifies the maximum lines per page for printing the report.

    size
    :   the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

        Note: You must specify the same lines per page for all reports written to the same ddname.

DDNAME
>	specifies the ddname where ExLM writes the report.

>	DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

>	***ddname***
>	>	the ddname.

SYSOUT
>	specifies that ExLM writes the report to the specified SYSOUT class.

>	DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

>	***class***
>	>	the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

NORECMSG
>	specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

>	***text***
>	>	specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

Usage

Use the REPORT RECALL statement to specify options for a Recall Report, which describes the recalls ExLM will perform. If ExLM stops prematurely or cannot perform all recalls, your mileage may vary from the Recall Report. When ExLM completes, the ExLM log (LCMLOG) contains messages describing which actions were performed and, for those that could not be performed, messages describing why the actions did not complete.

To produce a post-action report that lists the VTVs that were successfully recalled, create a REPORT VOLUME statement such as the following:

```
report volume

  when(action='Recall' and

       actionstatus='action successfully performed')

  column(volser,method,methodreason,vtvmvcid1,vtvmvcid2,vtvvtss);
```

Recall Report

Figure 80 shows an example of a Recall Report.

```
2002-06-2                  STORAGE TECHNOLOGY CORPORATION - ExLM              PAGE 3
4                          6.2.0
07:37:21


                           ExLM Daily Run


                           Recall Report                                      RECALL



VTV        Method   Reason    VTV        Method   Reason    VTV        Method   Reason


C07782              Recall1   C07832              Recall2   C07882     REC1     LOCATION

C07783              Recall1   C07833              Recall2   C07883     REC1     LOCATION

C07784     REC2     SetMethod C07834     REC3     LOCATION  C07884     REC2     LOCATION

C07785     REC2     SetMethod C07835     REC3     LOCATION  C07885     REC2     LOCATION

C07786     REC3     SetMethod C07836     REC3     LOCATION  C07886     REC3     LOCATION
```

Figure 80. Recall Report

The following list describes the Recall Report fields.

VTV
> the VTV volser.

Method

> the management method assigned to the VTV. If the method had conditions, the
> method name is followed by a slash (/) and the number of the condition that applied.

Note: If a volume is recalled by an ACTION RECALL statement, the Method column is
RECALL and the Reason column is the ACTION statement name. If a volume is recalled by a
PULLLIST statement, the Method column is PULLLIST and the Reason column is the
PULLLIST statement name.

Reason
> the reason the management method was assigned to the volume.

REPORT SCRCNT

The `REPORT SCRCNT` statement specifies options for a Scratch Count Report.

Syntax

```
►──REPORT────SCRCNT───────────────────────────────────────────────►
                    └─TITLE(text)─┘    └─PAGESIZE(size)─┘


  ┌──────────────────────────────┐
►─┴──DDNAME(ddname)──────────────┴────────────────────────────────►◄
   └─SYSOUT(─┬─class─┬─)─┘
             └─*─────┘
►───────────────────────────────────────────;─────────────────────►◄
                        ┌─STANDARD─┐
   └─TOTALS─(─┬─────────┼─ALL──────┼──────)─┘
             │          │   ,      │
             │      ┌───┴─LSM─┘    │
             │      ├─LSMGRP───────┤
             │      ├─LSMSUBGRP────┤
             │      └─TOTAL────────┘
```
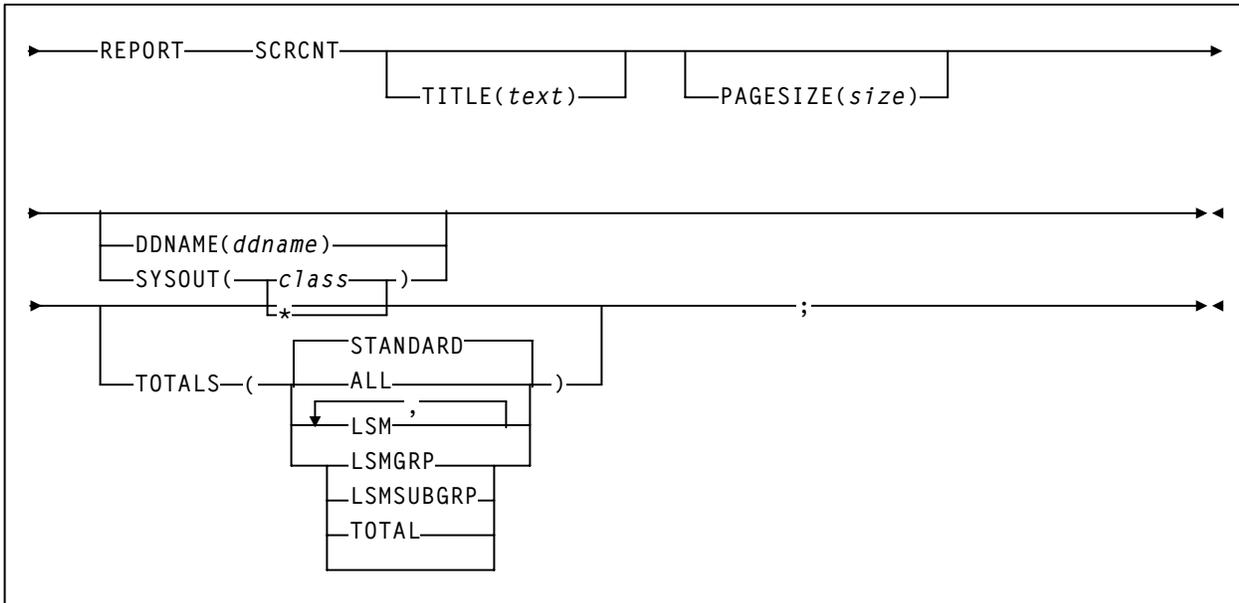
Figure 81. REPORT SCRCNT Statement Syntax

Parameters

Table 43 lists the valid abbreviations for the `REPORT SCRCNT` statement.

Table 43. REPORT SCRCNT Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
SCRCNT	SC
DDNAME	DD,DDN
STANDARD	STD
TAPEGRP	TG
TOTAL	TOT

TITLE

    specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

    If you do not specify `TITLE`, the title is "Cell Count Report".

    text

        the title, which is a maximum of 70 characters.

PAGESIZE

    specifies the maximum lines per page for printing the report.

    size

        the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

        Note: You must specify the same lines per page for all reports written to the same ddname.

DDNAME

    specifies the ddname where ExLM writes the report.

    `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

    ddname

        the ddname.

SYSOUT

specifies that ExLM writes the report to the specified `SYSOUT` class.

`DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

TOTALS

specifies the type of total lines for the scratch Counts Report.

If you do not specify the `TOTALS` parameter, the default is `STANDARD`.

ALL

all types of totals.

LSM

totals for each LSM.

LSMGRP

totals for each LSM group.

LSMSUBGRP

totals for each LSM subgroup.

STANDARD

ExLM selects totals.

TAPEGRP

totals for each tape group.

TOTAL

grand totals.

Usage

Use the `REPORT SCRCNT` statement to specify options for a Scratch Count Report.

Hint: Note that:

- The `OPTIONS` statement specifies global options that affect scratch volumes; for more information, see "OPTIONS" on page 126.

- The Scratch Count report also includes VTVs if they exist and if a VSM-specific option or field is specified.

- This report uses a "+" suffix to denote scratch counts, subtotals, and totals for existing VTV scratch volumes. Note that these counts are for only existing scratch VTVs when you ran the report, not for nonexistent scratch VTVs (which VSM can create as needed to satisfy scratch request), so actual scratch counts are generally higher.

Scratch Counts Report

Figure 82 shows an example Scratch Counts Report.

```
2002-04-                        STORAGE TECHNOLOGY CORPORATION - ExLM                    PAGE 3
17                              6.2.0
14:28:08


                                       Daily Vaulting Run



                                       Scratch Counts Report                               SCRCNT


Tape Group          ---Scratch---       ---Bad        ---Synchronize- --Eject- -Move  -Move ----Enter----
                                        Scratch---          --            -     In-    Out-

                    Init      Proj     Init    Proj    Change    Wrong                        Report   Addn'l


General

    LSM 00:00         0        0         0       0        0        0        0        0      0      0        0

    LSM 00:01         0        0         0       0        0        0        0        0      0      0        0

    LSM VSM        9972+     9972+       0       0        0        0        0        0      0      0        0

   Tape Group      9972+     9972+       0       0        0        0        0        0      0      0        0


HSM

    LSM 00:00         0        0         0       0        0        0        0        0      0      0        0

    LSM 00:01         0        0         0       0        0        0        0        0      0      0        0

    Tape Group        0        0         0       0        0        0        0        0      0      0        0


Production

    LSM 00:00      1157      1500        0       0        0        0        0       343     0      0        0
```

Figure 82. Scratch Counts Report

The following list describes the Scratch counts Report fields. For more information about VSM information on this report, see "Usage" on page 289.

Tape Group
> subpool name, followed by media type if this subpool is being managed by media type.

Scratch
> the initial and projected number of scratch volumes.

`Bad Scratch`
> the initial and projected number of bad scratch volumes.

`Synchronize`
> counts associated with scratch synchronization.

> `Change`
> > volumes whose scratch status was changed.

> `Wrong`
> > volumes with incorrect scratch status:

> > - If `OPTIONS NOSYNC` is specified, the count of volumes whose HSC volume scratch status indicators do not match TMS status.

> > - If `OPTIONS SYNC` is specified, the count of volumes ExLM was unable to `SYNC` or `HSCUNSCR` because of errors as described in a message written to the log file.

`Eject`
> the projected number of volumes that ExLM will eject. If you have specified the `OPTIONS EJCAP` parameter, ExLM can eject some or all of these volumes through the CAP of a different LSM. For more information, see "OPTIONS" on page 126.

`Move In`
> the number of scratch and bad scratch volumes being moved in.

`Move Out`
> the number of scratch and bad scratch volumes being moved out.

`Enter`
> the number of scratch volumes that need to be entered.

> `Report`
> > the number of scratch volumes on the Enter Report.

> `Addn'l`
> > the scratch volumes required in addition to the number listed on the Enter Report.

REPORT SUMMARY

The `REPORT SUMMARY` statement specifies options for a Summary Report.

Syntax

```
►──── REPORT ──── SUMMARY ──┬─────────────────────────┬───────────────────────►
                            ├── DDNAME(ddname) ────────┤
                            └── SYSOUT(─┬─class─┬─) ────┘
                                        └─ * ───┘

►──┬──────────────────┬──────┬──────────────────────┬──────── ; ────────►◄
   └── TITLE(text) ────┘      └── PAGESIZE(size) ─────┘
```
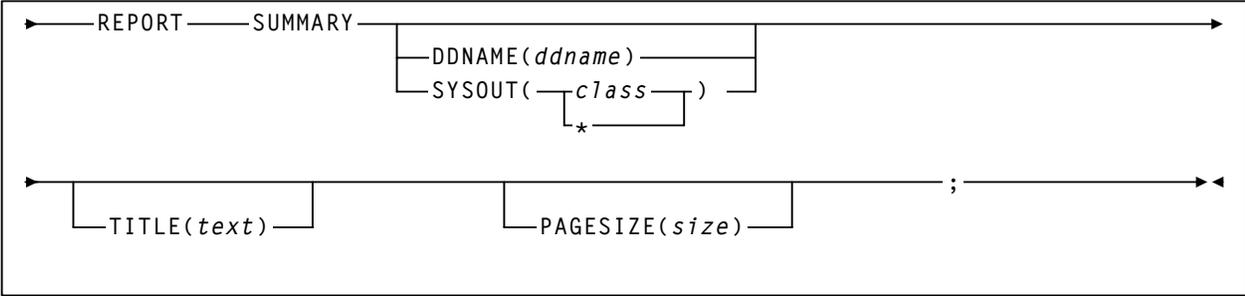
Figure 83. REPORT SUMMARY Statement Syntax

Parameters

Table 44 lists the valid abbreviations for the `REPORT SUMMARY` statement.

Table 44. REPORT SUMMARY Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
SUMMARY	SUM
DDNAME	DD,DDN

`TITLE`
> specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.
>
> If you do not specify `TITLE`, the title is "Cell Count Report".
>
> ***text***
> > the title, which is a maximum of 70 characters.

`PAGESIZE`
> specifies the maximum lines per page for printing the report.
>
> ***size***
> > the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.
> >
> > **Note:** You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`
> specifies the ddname where ExLM writes the report.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.
>
> ***ddname***
> > the ddname.

`SYSOUT`
> specifies that ExLM writes the report to the specified `SYSOUT` class.
>
> `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class
the `SYSOUT` class: A through Z or 0 through 9 or * for the default output class for the job.

Usage

Use the `REPORT SUMMARY` statement to specify options for a Summary Report.

The Scratch Count report also includes VTVs if they exist and if a VSM-specific option or field is specified. This report uses a "+" suffix to denote scratch counts, subtotals, and totals for existing VTV scratch volumes and for defined but not yet existing scratch VTVs (which VSM can create as needed to satisfy scratch request).

Summary Report

Figure 84 shows an example Summary Report.

```
2002-06-08              STORAGE TECHNOLOGY CORPORATION - ExLM 6.2.0                    PAGE 6
14:28:08


                             ExLM Daily Run


                          Summary Report                                              SUMMARY



   LSM   Name    Free              Non-  Ignored Eject   Move    Move   Enter  Status Status
               Cells Scratch Scratch                      In     Out          Change  Wrong



   00:00   Zero     80    1500   3699      0      5      199     391     280      2       0
   00:01    One    101     100   5742      0     94      391     199       0      0       0
```
Figure 84. Summary Report

The following list describes the Summary Report fields. For more information about VSM information on this report, see "Usage" on page 294.

LSM
  hexadecimal LSM ID. For VTVs, the LSM is reported as "VSM".

Name
  user-assigned LSM name from the `MANAGE PHYSICAL` statement.

Free Cells
  total number of free cells projected for the LSM after all scheduled cartridge moves, ejects, and enters have been performed.

Scratch

    total number of scratch volumes projected for the LSM after all scheduled cartridge moves, ejects, and enters have been performed.

Non-Scratch

    total number of nonscratch volumes projected for the LSM after all scheduled cartridge moves, ejects, and enters have been performed.

Ignored

    total number of volumes ignored because the SUBPOOL IGNORE parameter was specified.

Eject

    the projected number of volumes that ExLM will eject. If you have specified the OPTIONS EJCAP parameter, ExLM can eject some or all of these volumes through the CAP of a different LSM. For more information, see "OPTIONS" on page 126.

Move In

    the projected number of volumes that will be moved into the LSM.

Move Out

    the projected number of volumes moved out of the LSM.

Enter

    volumes to be entered into the LSM.

Status Change

    volumes whose scratch status was changed in the HSC CDS by the ExLM run. This count does not include status changes to be made with any movement into or out of an HSCUNSCR LSM group.

Status Wrong

    volumes with incorrect scratch status:

- If OPTIONS NOSYNC is specified, the count of volumes whose HSC volume scratch status indicators do not match TMS status.

    If OPTIONS SYNC is specified, the count of volumes ExLM was unable to SYNC or HSCUNSCR because of errors as described in a message written to the log file.

Optional Reports

ExLM Optional Reports, unlike Standard Reports, are not automatically produced; you must specifically request them. Optional Reports have a fixed output, and default and specifiable selection criteria for report contents.

A Data Set Report requires a REPORT DATASET statement to define the report contents and a REPORT parameter on the DATASET statement. For more information, see "REPORT DATASET" on page 297 and "DATASET" on page 98.

The Physical, Multiple, and Virtual reports are generated only when the following statements appear in an ExLM Parameter File:

- "REPORT MULTIPLE" on page 302
- "REPORT PHYSICAL" on page 307
- "REPORT VIRTUAL" on page 312

REPORT DATASET

The `REPORT DATASET` statement specifies options for a Data Set Report. If an automatic Dataset Report is printed, it uses the default options.
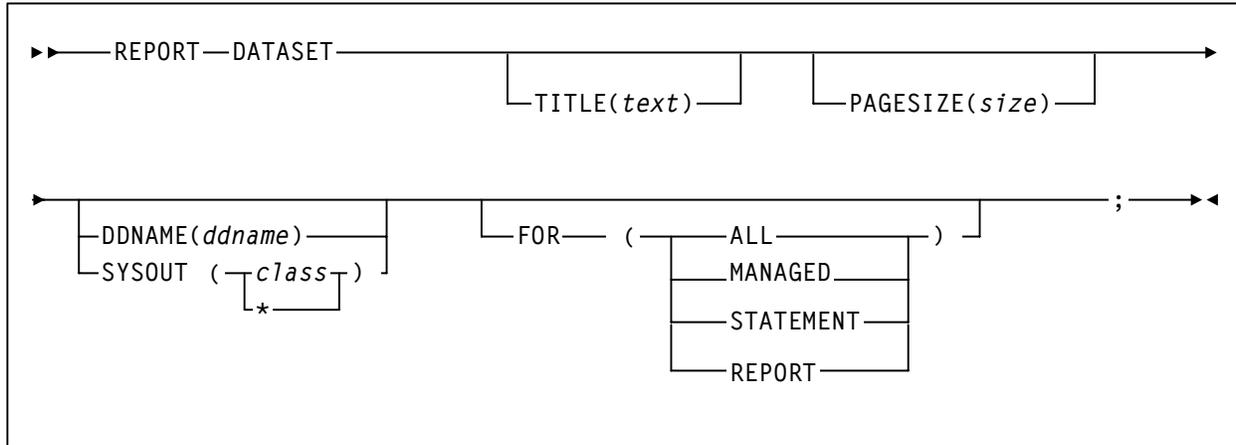
Syntax

Figure 85. REPORT DATASET Statement Syntax

Parameters

Table 45 lists the valid abbreviations for the `REPORT DATASET` statement.

Table 45. REPORT DATASET Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
DATASET	DS
DDNAME	DD,DDN

`TITLE`

    specifies the title on each page of the report. The `TITLE` parameter of the `OPTIONS` statement defines a main title to be printed in the report headings. The title specified by the `TITLE` parameter of a `REPORT` statement is printed below this main title.

    If you do not specify `TITLE`, the title is "Cell Count Report".

    text

        the title, which is a maximum of 70 characters.

`PAGESIZE`

    specifies the maximum lines per page for printing the report.

    size

        the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL `EXEC` statement. Otherwise, the default is 58.

        Note: You must specify the same lines per page for all reports written to the same ddname.

`DDNAME`

    specifies the ddname where ExLM writes the report.

    `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

    ddname

        the ddname.

`SYSOUT`

    specifies that ExLM writes the report to the specified `SYSOUT` class.

    `DDNAME` and `SYSOUT` are mutually exclusive. If you specify neither, ExLM writes the report to `DDNAME(SYSPRINT)`.

class

the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

FOR

specifies the data sets included on the Data Set Report. If you do not specify the FOR parameter, the default is REPORT.

ALL

all data sets processed by ExLM except data sets that belong to a subpool for which:

- IGNORE has been specified.

- the TMS is different than that specified on the TMSNAME parameter.
For more information, see "SUBPOOL" on page 154.

MANAGED

only volumes covered by a MANAGE statement.

STATEMENT

only volumes of data sets covered by a DATASET statement.

REPORT

only volumes of data sets covered by a DATASET statement with the REPORT option.

Usage

Use the REPORT DATASET statement to specify options for a Data Set Report, which displays data set and associated volume information.

Data Set Report

Figure 86 shows an example of a Data Set Report.

```
2002-03-02              STORAGE TECHNOLOGY CORPORATION -                    PAGE 7
13:37:21                ExLM 6.2.0

                        ExLM Daily Run

TMS Main                Covered Data Sets                                   DATASET


Data Set Name      Seq Serial Locatio LSM    Method Reason Cr Date  Rf Date  Covered by
                               n
OPR.SYSLOG.DAILY.G0591  C00855 Local  00:01  Syslog Datase 2000-02-2 2000-02-2 OPR.SYSLOG.**
8V00                                                t      3         3
OPR.SYSLOG.DAILY.G0591  C00477 Local  00:01  Syslog Datase 2000-02-2 2000-02-2 OPR.SYSLOG.**
7V00                                                t      2         3
```
Figure 86. Data Set Report

The following list describes the Data Set Report fields.

Data Set Name
    the name of the first data set on the volume. The data set name is blank for
    subsequent volumes of a multi-volume data set.

Seq
    the sequence number of a volume allocated to a multi-volume data set. Seq is 1 for a
    single volume data set.

Serial
    the volser of the volume associated with the data set.

Location
    the location name for the data set's associated volume.

LSM
    the hexadecimal LSM ID where the volume resides. This field is a dash (-) if the
    volume is not in an LSM.

Method
    the management method assigned to the volume.

    If the method has conditions, the method is followed by a slash (/) and the number of
    the COND that applies. If the management method assigns EJECT(ASNEEDED) to the
    volume and if CYCLESOON, MINENTER, or MINREF also applies to the volume, a dash (-)
    precedes the name of the method to show that EJECT(NO) overrode
    EJECT(ASNEEDED).

Reason
    the reason the management method was assigned to the volume.

Cr Date
    the data set's creation date as reported by the TMS.

Rf Date
    the data set's last referenced date as reported by the TMS.

Covered by
    the most specific matching identifier for the data set name on a DATASET statement in
    the parameter file used for this run.

REPORT MULTIPLE

The `REPORT MULTIPLE` statement specifies options for an MVC Report.

Syntax

Figure 87. REPORT MULTIPLE Statement Syntax

Parameters

TITLE
> specifies the title on each page of the report. The TITLE parameter of the OPTIONS statement defines a main title to be printed in the report headings. The title specified by the TITLE parameter of a REPORT statement is printed below this main title.
>
> If you do not specify TITLE, the title is "Cell Count Report".
>
> ***text***
>> the title, which is a maximum of 70 characters.

PAGESIZE
> specifies the maximum lines per page for printing the report.
>
> ***size***
>> the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL EXEC statement. Otherwise, the default is 58.
>>
>> **Note:** You must specify the same lines per page for all reports written to the same ddname.

DDNAME
> specifies the ddname where ExLM writes the report.
>
> DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).
>
> ***ddname***
>> the ddname.

SYSOUT
> specifies that ExLM writes the report to the specified SYSOUT class.
>
> DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).
>
> ***class***
>> the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

STYLE (PRINT | DATA)
> specifies the report style.
>
> PRINT
>> format the report for printing (include report titles and column headings).
>>
>> Printed reports have the same DCB requirements as the other ExLM reports. See "Using ExLM to Manage Nearline Resources" on page 33 for more information about DCB attributes.

`DATA`
> format the report for post processing without report titles and column headings. You can direct `DATA` reports to any data set with a RECFM of F, FB, V, or VB that has an LRECL large enough to accommodate an output line.
>
> If you specify `STYLE(DATA)`, you cannot specify the:
>
> - `PAGESIZE` parameter,
> - `PAGE` subparameter of the `CONTROL` parameter, and
> - `HEADING` subparameter of the `COLUMN` parameter.

DETAIL
> produce a detailed report, including all the VTVs on each MVC. If you do not specify this option, the default is to produce a summary report of MVCs only.

WHEN(`condition`**)**
> specifies one of the following for volume selection:

Field List
> specifies the fields to use for volume selection. For a volume to be selected, the value for each *field* must match at least one of the provided *values* or *ranges*.

Condition
> specifies a condition for volume selection.

> *field cond value*
>> specifies a field, a condition, and a value to compare with one of the following conditions:
>>
>> **EQ**
>>> equal to.
>>
>> **NE**
>>> not equal to.
>>
>> **GE**
>>> greater than or equal to.
>>
>> **GT**
>>> greater than.
>>
>> **LE**
>>> less than or equal to.
>>
>> **LT**
>>> less than.
>>
>> For example, `VOLSER GE A00243` selects volsers greater than or equal to A00243.

field `MATCHES` *mask*

> specifies a field and a mask for selection. The valid masks depend on the field selected:

> - `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

>> "**" matches one or more data set qualifiers.

>> "*" matches one or more characters within a qualifier.

>> "%" matches one character within a qualifier.

> - Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

>> "*" matches one or more characters.

>> "%" matches one character.

> For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

> specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

> For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

> reverses the condition that immediately follows the `NOT` keyword.

> For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

> make the selection if both conditions are true.

> For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

> make the selection if either condition is true.

> For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

NORECMSG

> specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

Usage

Note: The `REPORT PHYSICAL`, `REPORT MULTIPLE`, and `REPORT VIRTUAL` statements generate an expanded listing in the parameter file showing the statements created for the appropriate Custom Report. For more information, see "REPORT Statement Templates" on page 17.

REPORT PHYSICAL

The `REPORT PHYSICAL` statement specifies options for a Nearline volume report.

Syntax

```
▶──┬─REPORT───PHYSICAL─────────────────────────────────────────────────────────▶
                            └─TITLE(text)─┘      └─PAGESIZE(size)─┘

▶──┬──────────────────────┬──────────────────────────────────────────────────▶
   ├─DDNAME(ddname)────────┤      ┌─PRINT─┐
   └─SYSOUT──(─┬─class─┬─)─┘   └─STYLE(─┼───────┼─)─┘
              └─*────┘                 └─DATA─┘

▶──WHEN(──┬─Condition──┬──)────────────────────────────────────────────────────▶
          └─Field List─┘              └─NORECMSG(text)─┘

▶──┬──────────────────────────────────────────────────┬────────────────────────▶
   └─SUMMARY──(──┬─TOTAL───┬──)─┘
                 └─SUBPOOL─┘
                                                                            ;
▶──┬──────────────────────────────────────────────────────┬───────────────────◀
   └─CONTROL──(·field──┬─ASCENDING──┬──)─┘
                       └─DESCENDING─┘
```

Field List:

```
├──field──(──┬─value─┬──)──────────────────────────────────────────────────────┤
             └─range─┘
```

Condition:

```
├──┬─field──cond──value────────┬──┬──────────────────────┬─────────────────────┤
   ├─field──MATCHES──mask─────┤  │  ┌─AND─┐             │
   ├─booleanfield─────────────┤  └──┼─────┼──Condition──┘
   ├─NOT──┤ Condition ├───────┤     └─OR──┘
   └──(──┤ Condition ├──)──────┘
```
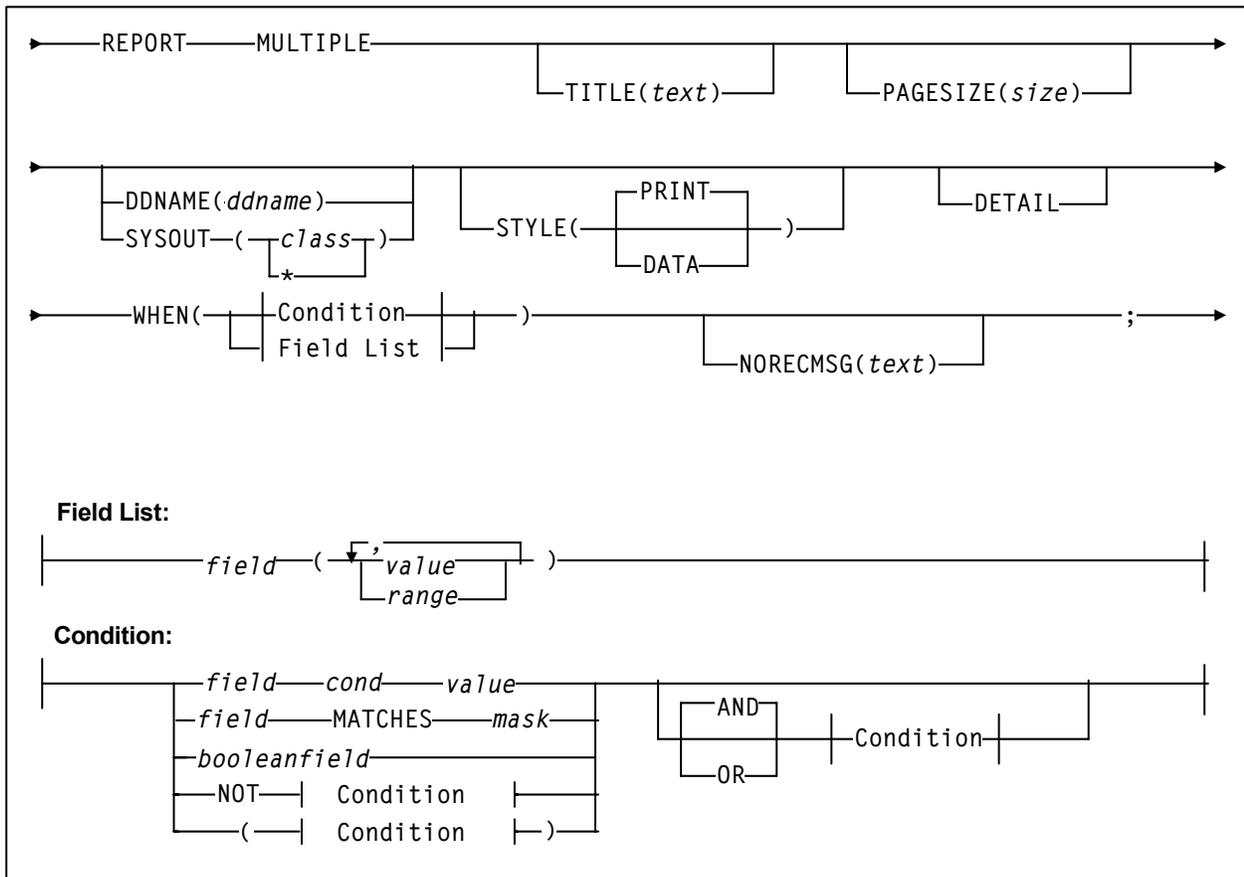
Figure 88. REPORT PHYSICAL Statement Syntax

Parameters

TITLE
> specifies the title on each page of the report. The TITLE parameter of the OPTIONS statement defines a main title to be printed in the report headings. The title specified by the TITLE parameter of a REPORT statement is printed below this main title.
>
> If you do not specify TITLE, the title is "Cell Count Report".
>
> ***text***
> > the title, which is a maximum of 70 characters.

PAGESIZE
> specifies the maximum lines per page for printing the report.
>
> ***size***
> > the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL EXEC statement. Otherwise, the default is 58.
> >
> > **Note:** You must specify the same lines per page for all reports written to the same ddname.

DDNAME
> specifies the ddname where ExLM writes the report.
>
> DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).
>
> ***ddname***
> > the ddname.

SYSOUT
> specifies that ExLM writes the report to the specified SYSOUT class.
>
> DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).
>
> ***class***
> > the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

STYLE (PRINT | DATA)
> specifies the report style.
>
> PRINT
> > format the report for printing (include report titles and column headings).
> >
> > Printed reports have the same DCB requirements as the other ExLM reports. See "Using ExLM to Manage Nearline Resources" on page 33 for more information about DCB attributes.

`DATA`

format the report for post processing without report titles and column headings. You can direct `DATA` reports to any data set with a RECFM of F, FB, V, or VB that has an LRECL large enough to accommodate an output line.

If you specify `STYLE(DATA)`, you cannot specify the:

- `PAGESIZE` parameter,
- `PAGE` subparameter of the `CONTROL` parameter, and
- `HEADING` subparameter of the `COLUMN` parameter.

WHEN(`condition`**)**

specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each `field` must match at least one of the provided `values` or `ranges`.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- **DATASETNAME, BASENAME**: Specify a string in single quotes. Wildcards can be used as follows:

  "******" matches one or more data set qualifiers.

  "*****" matches one or more characters within a qualifier.

  "**%**" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "*****" matches one or more characters.

  "**%**" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

NOT

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

AND

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

OR

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

NORECMSG

specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text

specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

SUMMARY

specifies one of the following report summaries:

TOTAL

specifies that totals of scratch, selected, errant, available cells, and external label status types be provided on an LSM, ACS, and library basis in the report.

SUBPOOL

specifies that subpool totals be provided on an LSM, ACS, and library basis in the report.

CONTROL

specifies one or more control fields, separated by commas, to indicate the order in which ExLM process volumes selected by this `ACTION` statement. The default is:

`CONTROL(SERIAL ASCENDING).`

field

specifies a sort field. The same volume fields available for specifying `WHEN` conditions can also be specified on the `CONTROL` parameter.

attr

specifies control information for the preceding sort field.

`ASCENDING | DESCENDING`

specifies whether to process the selected volumes in ascending or descending volser order.

Usage

The `REPORT PHYSICAL`, `REPORT MULTIPLE`, and `REPORT VIRTUAL` statements generate an expanded listing in the parameter file showing the statements created for the appropriate Custom Report. For more information, see "REPORT Statement Templates" on page 17.

REPORT VIRTUAL

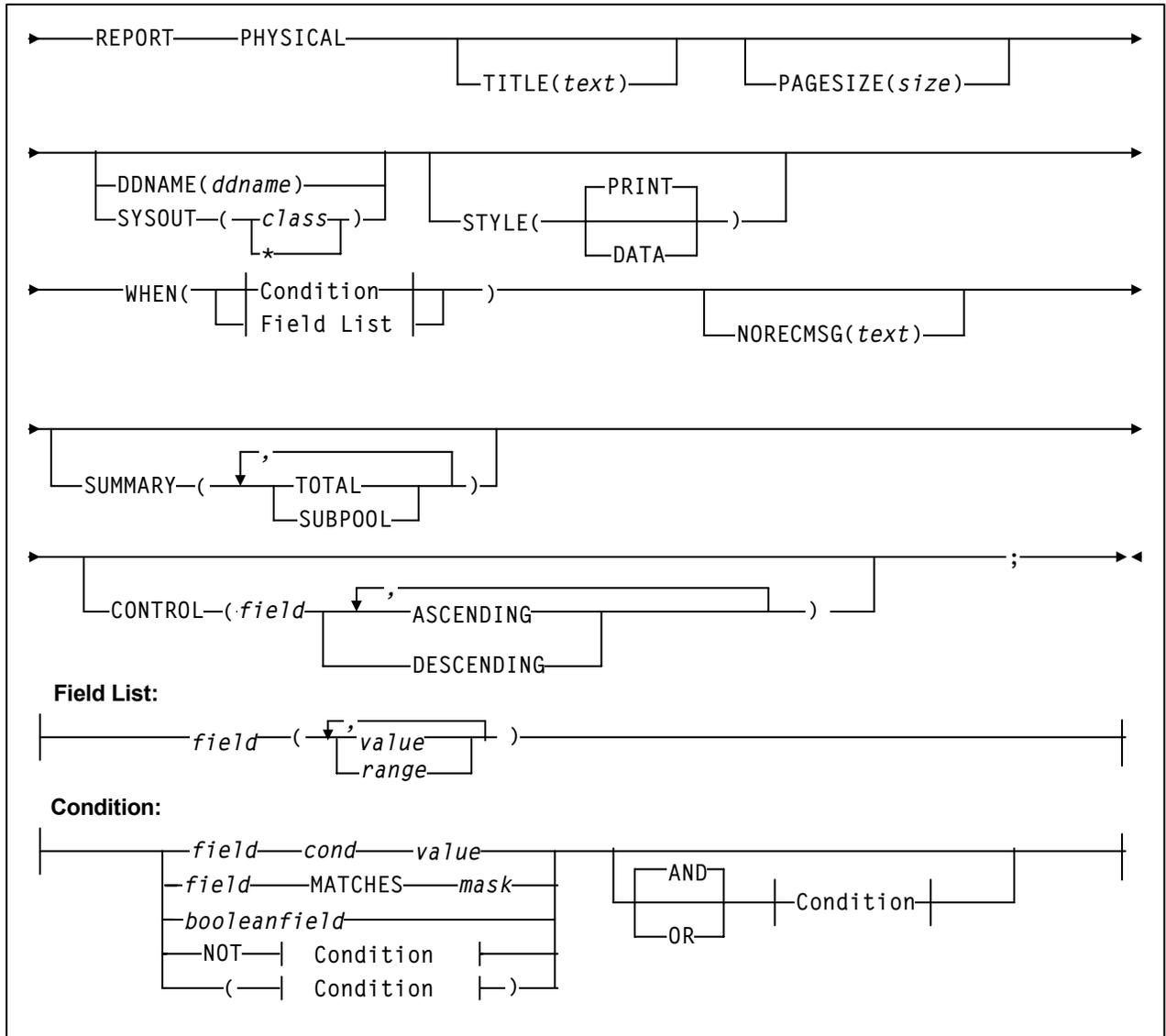The `REPORT VIRTUAL` statement specifies options for a VTV Report.

Syntax

```
►──REPORT──────VIRTUAL────────────────────────────────────────────────────────────────►
                              ┌─TITLE(text)─┐        ┌─PAGESIZE(size)─┐

►──────┬─────────────────────────┬──────┬─────────────────────────┬──────────────────►
       ├─DDNAME(ddname)───────────┤      │        ┌─PRINT─┐
       └─SYSOUT(──┬─class─┬─)─────┘      └─STYLE(──┼───────┼──)──────┘
                  └─*─────┘                        └─DATA──┘
►──WHEN(──┬─Condition──┬──)──────────────────────────────────────────;──────►◄
          └─Field List─┘         └─NORECMSG(text)─┘


Field List:
├──────field──(──┬─value─┬──)──────────────────────┤
                 └─range─┘

Condition:
├──┬─field────cond──────value─────────┬──┬──────────────────────┬──┤
   ├─field────MATCHES────mask──────────┤  │   ┌─AND─┐
   ├─booleanfield──────────────────────┤  └───┼─────┼──Condition─┘
   ├─NOT──┤ Condition ├────────────────┤      └─OR──┘
   └─(──┤ Condition ├──)────────────────┘
```
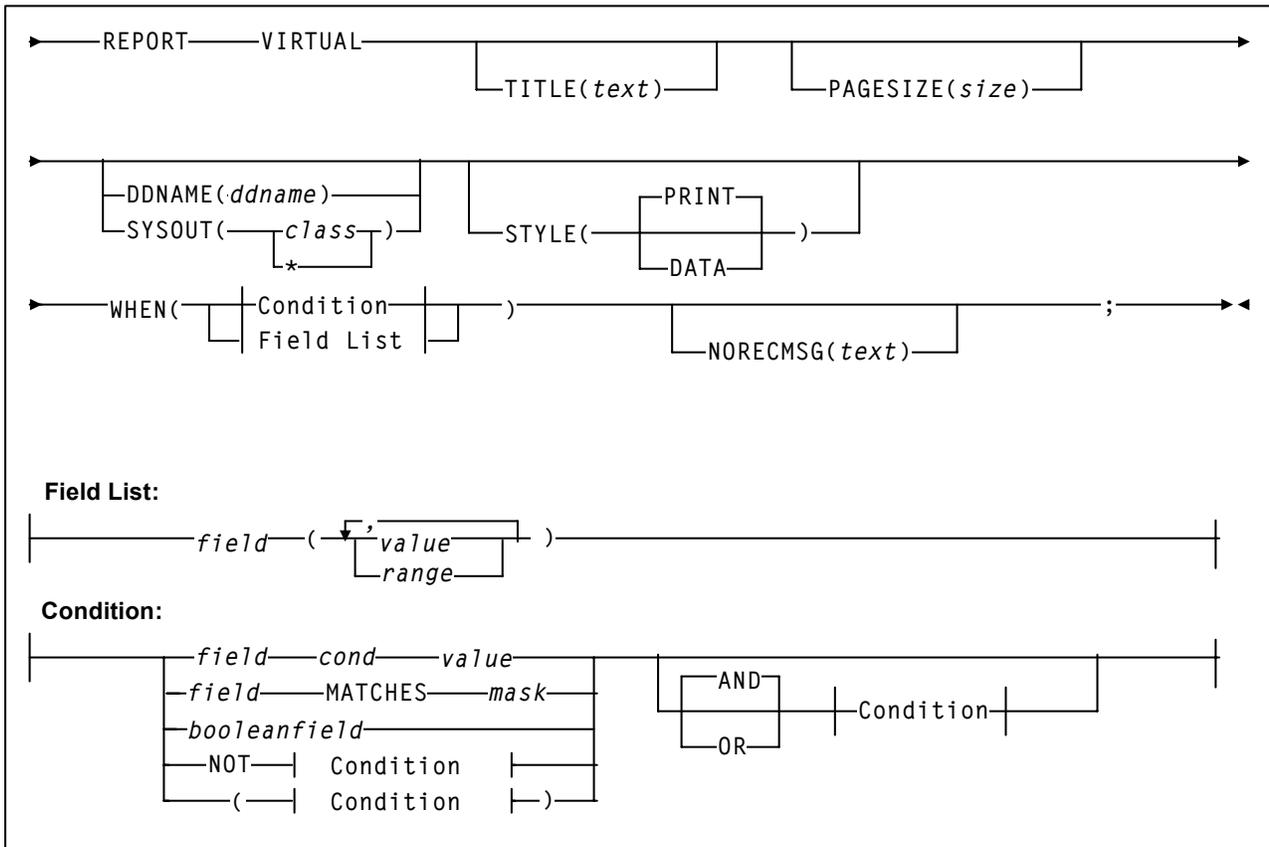
Figure 89. REPORT VIRTUAL Statement Syntax

Parameters

TITLE

specifies the title on each page of the report. The TITLE parameter of the OPTIONS statement defines a main title to be printed in the report headings. The title specified by the TITLE parameter of a REPORT statement is printed below this main title.

If you do not specify TITLE, the title is "Cell Count Report".

text

the title, which is a maximum of 70 characters.

PAGESIZE

specifies the maximum lines per page for printing the report.

size

the maximum lines per page. Valid values are 20 to 1000. You can specify a default pagesize for all reports on the ExLM main program JCL EXEC statement. Otherwise, the default is 58.

Note: You must specify the same lines per page for all reports written to the same ddname.

DDNAME

specifies the ddname where ExLM writes the report.

DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

ddname

the ddname.

SYSOUT

specifies that ExLM writes the report to the specified SYSOUT class.

DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

class

the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

STYLE (PRINT | DATA)

specifies the report style.

PRINT

format the report for printing (include report titles and column headings).

Printed reports have the same DCB requirements as the other ExLM reports. See "Using ExLM to Manage Nearline Resources" on page 33 for more information about DCB attributes.

DATA
> format the report for post processing without report titles and column headings. You can direct DATA reports to any data set with a RECFM of F, FB, V, or VB that has an LRECL large enough to accommodate an output line.

> If you specify STYLE(DATA), you cannot specify the:

> - PAGESIZE and LINESIZE parameters,

> - PAGE subparameter of the CONTROL parameter, and

> - HEADING subparameter of the COLUMN parameter.

MANIFEST
> the DDname of an Export Manifest File used to generate the report.

> ***ddame***
>> the ddname of the file.

NORECMSG
> specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

> ***text***
>> specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

WHEN
> selects volumes for the report using one of the following:

> **VOLSER**
>> the volser.

>> ***value | range***
>>> a volser or range of volsers.

> **VTVUNAVAIL**
>> selects unavailable VTVs.

AND
> select the volume if both conditions are true.

WHEN(condition**)**
> specifies one of the following for volume selection:

Field List

specifies the fields to use for volume selection. For a volume to be selected, the value for each *field* must match at least one of the provided *values* or *ranges*.

Condition

specifies a condition for volume selection.

field cond value

specifies a field, a condition, and a value to compare with one of the following conditions:

EQ

equal to.

NE

not equal to.

GE

greater than or equal to.

GT

greater than.

LE

less than or equal to.

LT

less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME`, `BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

  "******" matches one or more data set qualifiers.

  "*****" matches one or more characters within a qualifier.

  "**%**" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

  "*****" matches one or more characters.

  "**%**" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

`AND`

make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

`OR`

make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

Note: For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

Usage

Note: The `REPORT PHYSICAL`, `REPORT MULTIPLE`, and `REPORT VIRTUAL` statements generate an expanded listing in the parameter file showing the statements created for the appropriate Custom Report. For more information, see "REPORT Statement Templates" on page 17.

Custom Reports

Custom Reports, which must be explicitly requested, provide both a wide range of selection criteria and output formats that can be ordered and sorted in many ways. The Custom Reports are produced via the following statements:

- "REPORT LSM" on page 318
- "REPORT MVC_VTV" on page 320
- "REPORT VOLUME" on page 322

The Custom Reports provide report templates that you can use as is or customize. For more information, see "REPORT Statement Templates" on page 17.

REPORT LSM

The REPORT LSM statement produces a custom LSM Report.

Syntax - REPORT LSM

Figure 90. REPORT LSM Statement Syntax - Part 1

Field List:

```
                    ┌─────┐,
├────────field──(───▼──value──┬──)────────────────────────┤
                   └─range────┘
```

Condition:

```
     ┌──field────cond────value────┐    ┌──AND──┐
├────┼──field────MATCHES────mask───┼────┤       ├──┬─────────────┬──────┤
     ├──booleanfield──────────────┤    └──OR───┘  └──Condition──┘
     ├──NOT──┤ Condition ├─────────┤
     └──(──┤ Condition ├──)────────┘
```

Control Attr:

```
   ┌──ASCENDING───┐
├──┼──────────────┼──┬────────┬──────────────────────────────────────────►
   └──DESCENDING──┘  └─BREAK──┘         ┌─PAGE(──────────|Expression|────)─┐
                                        └──────────────────────────────────┘
```

```
├──┬──────────────────────────────────┬──┬────────────────────────────────┬►
   │           ┌──┐,                   │  │            ┌──┐,               │
   └─HEADING(──▼──|Expression|──┬──)───┘  └─FOOTING(───▼──|Expression|─┬─)─┘
```

```
●──┬───────────────────────────────┬──────────────────────────────────┤
   ├──NOSUMMARY────────────────────┤
   │           ┌──┐,               │
   └─SUMMARY(──▼──|Expression|─┬─)─┘
```

Column Attr:

```
├──┬──────────────────┬──┬─────────────┬──┬───────────┬──┬────────┬──────►
   └─FORMAT(format)────┘  └─GUTTER(size)─┘  └─SIZE(size)─┘  └─NODUP──┘
```

```
●──┬───────────────────────────────┬──┬─────────────────────────┬──────┤
   │           ┌──┐,               │  └─RELATE(columns text)─────┘
   └─HEADING(──▼──|Expression|─┬─)─┘
```

Expression:

```
                              ┌────────CONCAT────────────────────┐
   ┌──────────────────────────┤                                  │
├──▼──┬──field────────────────────────┬──┬────────────────────┬──┴──────┤
      ├──text─────────────────────────┤  └─| Format Specifier |┘
      ├──function─────────────────────┤
      └──┤ Condition ├────────────────┘
```

Format Specifier:

```
├───┬──{───────────────────────────────────────────────}───┬──────────┤
    │      ┌──size──┐                                       │
    └──────┤        ├──┬────────┬──┬─────────┬─────────────┘
                       ├─CENTER─┤  └─format──┘
                       ├─LEFT───┤
                       └─RIGHT──┘
```
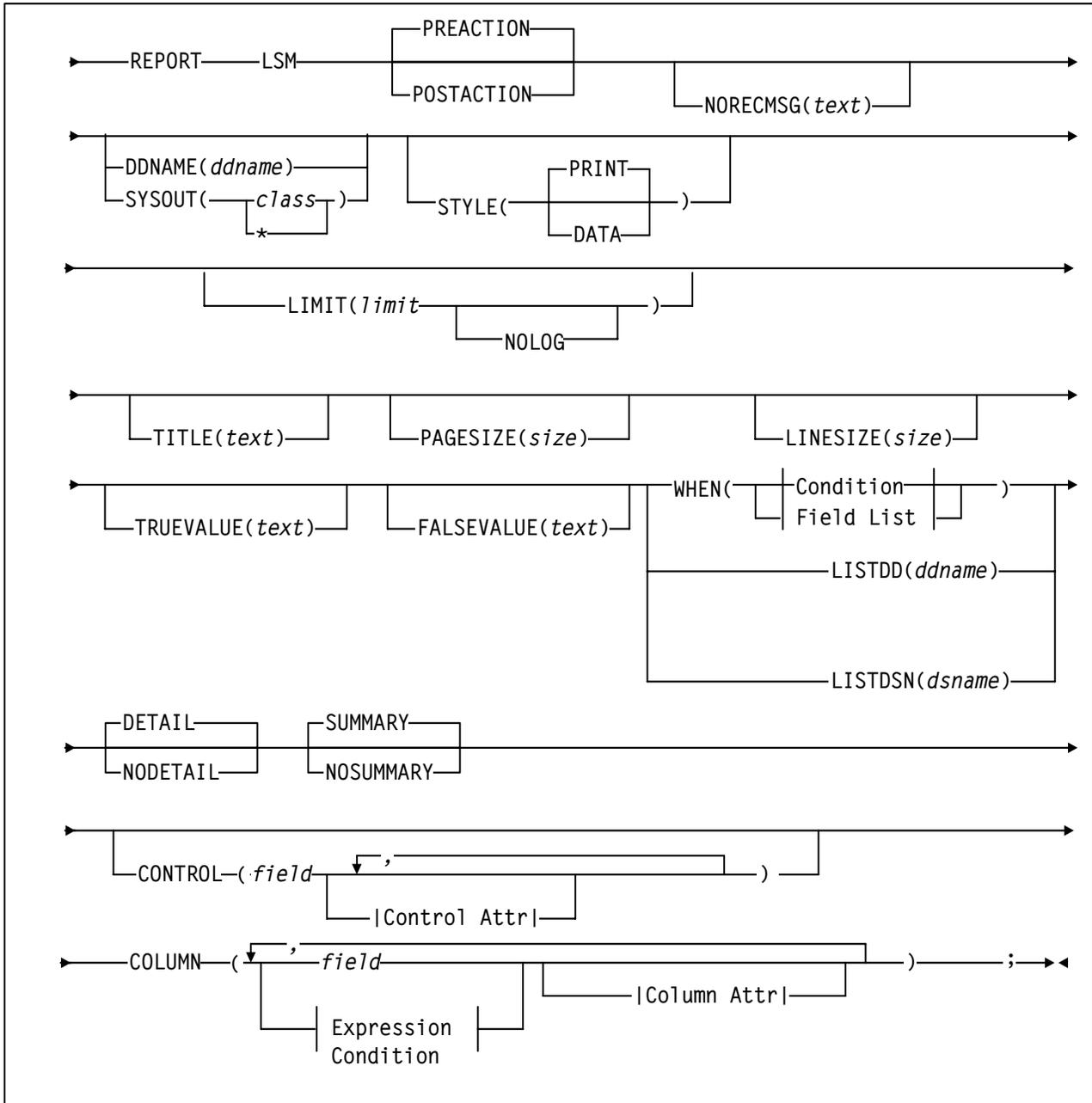
Figure 91. REPORT LSM Statement Syntax - Part 2

REPORT MVC_VTV

The `REPORT MVC_VTV` statement produces a custom MVC/VTV Report.

Syntax - REPORT MVC_VTV

Figure 92. REPORT MVC_VTV Statement Syntax - Part 1

Field List:

```
├─────────field──(──┬─┬─value─┬─┬──)─────────────────────────────────┤
                    │ └───────┘ │
                    └──range────┘
```

Condition:

```
├──┬──field──────cond──────value────────┬──┬──────────────────┬────────┤
   ├──field──────MATCHES──────mask───────┤  │  ┌──AND──┐       │
   ├──booleanfield───────────────────────┤  └──┤      ├──┤ Condition ├──┘
   ├──NOT──┤ Condition ├──────────────────┤     └──OR──┘
   └──(──┤ Condition ├──)─────────────────┘
```

Control Attr:

```
   ┌──ASCENDING───┐
├──┤              ├──┬─────────┬──┬──────────────────────────────┬──────►
   └──DESCENDING──┘  └──BREAK──┘  └──PAGE(──────────|Expression|──)──┘
```

```
►──┬──────────────────────────────────┬──┬────────────────────────────────┬──►
   └──HEADING(──┬─,──────────┬──)──────┘  └──FOOTING(──┬─,──────────┬──)────┘
                └─|Expression|─┘                       └─|Expression|─┘
```

```
●──┬────────────────────────────────┬────────────────────────────────────┤
   ├──NOSUMMARY─────────────────────┤
   └──SUMMARY(──┬─,──────────┬──)────┘
                └─|Expression|─┘
```

Column Attr:

```
├──┬──────────────────┬──┬──────────────┬──┬──────────────┬──┬──────────┬──►
   └──FORMAT(format)───┘  └──GUTTER(size)─┘  └──SIZE(size)──┘  └──NODUP──┘
```

```
●──┬──────────────────────────────────┬──┬─────────────────────────┬──────┤
   └──HEADING(──┬─,──────────┬──)──────┘  └──RELATE(columns text)────┘
                └─|Expression|─┘
```

Expression:

```
                            ┌──────────CONCAT──────────┐
├──┬──┬──field─────────────┬──┴──┬────────────────────┬┴──────────────────┤
   │  ├──text──────────────┤     └──| Format Specifier |─┘
   │  ├──function──────────┤
   │  └──┤ Condition ├──────┘
   └───────────────────────┘
```

Format Specifier:

```
├──┬──{──────────────────────────────────────────────}──┬──────────────┤
   └──┬──size──┬───────────────┬──┬──────────┬─────────┘
            │  ├──CENTER──┤     └──format──┘
            │  ├──LEFT────┤
            │  └──RIGHT───┘
```
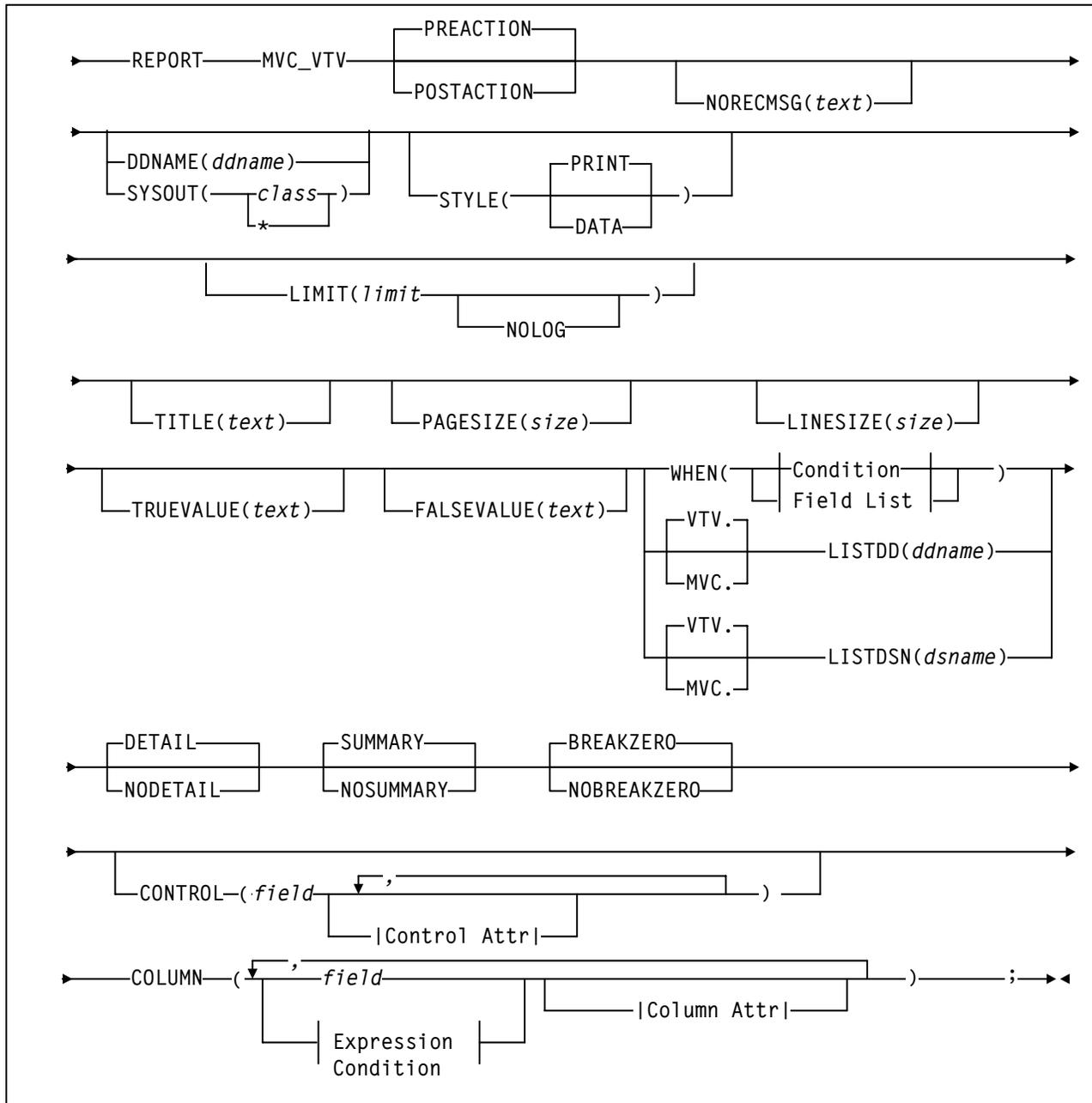
Figure 93. REPORT MVC_VTV Statement Syntax - Part 2

REPORT VOLUME

The REPORT VOLUME statement produces a custom Volume Report.
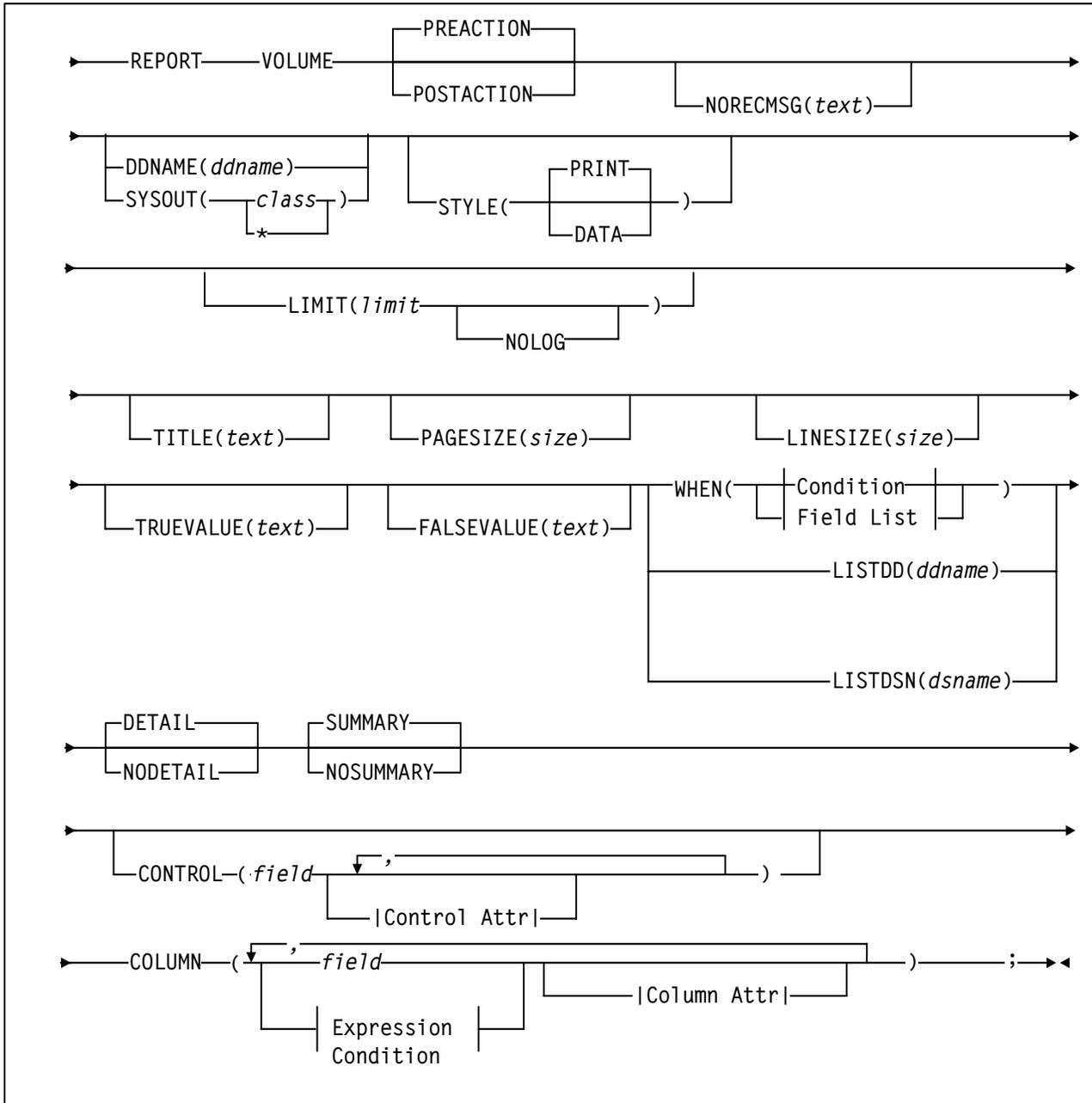
Syntax - REPORT VOLUME

Figure 94. REPORT VOLUME Statement Syntax - Part 1

Field List:

```
                   ┌──,──────┐
├─── field ──( ──▼── value ──┴── ) ─────────────────────────────┤
                     └─ range ─┘
```

Condition:

```
        ┌─ field ──── cond ──── value ──────┐   ┌─── AND ──┐
├───────┼─ field ──── MATCHES ──── mask ────┼───┤          ├──────────────┤
        ├─ booleanfield ────────────────────┤   └─── OR ───┘  ┌──────────┐
        ├─ NOT ──┤ Condition ├──────────────┤              ───┤ Condition ├──
        └─ ( ──┤ Condition ├── ) ───────────┘
```

Control Attr:

```
        ┌── ASCENDING ──┐
├───────┼───────────────┼─────┬── BREAK ──┬───────┬─ PAGE( ──────── |Expression| ──── ) ─┬──▶
        └── DESCENDING ─┘      └───────────┘       └──────────────────────────────────────┘
```

```
        ┌───────────────────────────────────────┐   ┌──────────────────────────────────────────┐
├───────┤              ┌──,───────────┐          ├───┤              ┌──,───────────┐             ├──▶
        └─ HEADING( ──▼── |Expression| ──┴── ) ──┘   └─ FOOTING( ──▼── |Expression| ──┴── ) ─────┘
```

```
●────┬──────────────────────────────────────────┬──────┤
     ├─ NOSUMMARY ────────────────────────────────┤
     └─ SUMMARY( ──┐       ┌──,───────────┐  ──── ) ─┘
                    └──────▼── |Expression| ──┘
```

Column Attr:

```
├──┬─ FORMAT( format ) ─┬──┬─ GUTTER( size ) ─┬──┬─ SIZE( size ) ─┬──┬─ NODUP ─┬──▶
   └────────────────────┘  └──────────────────┘  └────────────────┘  └─────────┘
```

```
●────┬────────────────────────────────────────────┬──┬─ RELATE( columns text ) ─┬──┤
     └─ HEADING( ──┐       ┌──,───────────┐ ── ) ──┘  └──────────────────────────┘
                    └──────▼── |Expression| ──┘
```

Expression:

```
                             ┌──────────── CONCAT ────────────────┐
   ┌──────────┬─ field ──────────────────────────────────────────┼──────────┤
   │          ├─ text ──────────────────────────┐                 │
   ▼          ├─ function ──────────────────────┤   └─ | Format Specifier | ─┘
   │          └──┤ Condition ├──────────────────┘
   └──────────────────────────────────────────────
```

Format Specifier:

```
      ┌─── {  ──────────────────────────────────────────── } ───┐
├─────┤                                                          ├──────┤
      └── size ──┬────────────┬── format ──┐
                 ├── CENTER ──┤
                 ├── LEFT ────┤
                 └── RIGHT ───┘
```

Figure 95. REPORT VOLUME Statement Syntax - Part 2

Custom Report Parameters

Table 1 lists the valid abbreviations for the Custom Reports.

Table 46. Custom Report Statement Abbreviations

Statement or Parameter	Abbreviation
REPORT	RPT
DDNAME	DD,DDN
EQ	=
GE	>=
GT	>
LE	<=
LT	<
NE	¬=
NOT	¬
AND	&
OR	|
CONCAT	||

PREACTION | POSTACTION
>   specifies whether ExLM produces the report before or after volume ejects, moves, and consolidations.
>
>   If you specify PREACTION, the report's success and failure related fields show a - (missing value) because no action has occurred, but fields describing planned actions have values.
>
>   If you specify POSTACTION, all report fields have values. POSTACTION reports require a different ddname than PREACTION reports.

NORECMSG
>   specifies the text to print if no records are printed on the report. The specified text prints where the first record would appear.

text
>   specifies the text to print, which is a maximum of 70 characters. The default text is 'No records to print for this report.'

DDNAME
>   specifies the ddname where ExLM writes the report.
>
>   DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).

ddname
>   the ddname.

SYSOUT
>   specifies that ExLM writes the report to the specified SYSOUT class.
>
>   DDNAME and SYSOUT are mutually exclusive. If you specify neither, ExLM writes the report to DDNAME(SYSPRINT).
>
>   *class*
>   >   the SYSOUT class: A through Z or 0 through 9 or * for the default output class for the job.

STYLE (PRINT | DATA)
>   specifies the report style.
>
>   PRINT
>   >   format the report for printing (include report titles and column headings).
>   >
>   >   Printed reports have the same DCB requirements as the other ExLM reports. See "Using ExLM to Manage Nearline Resources" on page 33 for more information about DCB attributes.
>
>   DATA
>   >   format the report for post processing without report titles and column headings. You can direct DATA reports to any data set with a RECFM of F, FB, V, or VB that has an LRECL large enough to accommodate an output line.
>   >
>   >   If you specify STYLE(DATA), you cannot specify the:
>   >
>   >   - PAGESIZE and LINESIZE parameters,
>   >   - PAGE subparameter of the CONTROL parameter, and
>   >   - HEADING subparameter of the COLUMN parameter.

LIMIT
>   specifies the maximum number of volumes processed by this statement. The limit is applied based on the sort order established by the CONTROL parameter.
>
>   *limit*
>   >   specify a number between 1 and 999999.
>
>   **NOLOG**
>   >   specifies that ExLM does not issue message LCM2317.

TITLE
>   specifies the title on each page of the report. The TITLE parameter of the OPTIONS statement defines a main title to be printed in the report headings. The title specified by the TITLE parameter of a REPORT statement is printed below this main title.
>
>   If you do not specify TITLE, the title is "Volume", "LSM", or "MVC_VTV".

text

> the title, which is a maximum of 70 characters.

PAGESIZE

> specifies the maximum lines per page for printing the report.

size

> the maximum lines per page. Valid values are 20 to 1000. You can specify a
> default pagesize for all reports on the ExLM main program JCL EXEC statement.
> Otherwise, the default is 58.

> **Note:** You must specify the same lines per page for all reports written to the
> same ddname.

LINESIZE

> specifies the maximum line size for printing the report.

size

> the maximum line size. Valid values are 72 to 250, the default is 132.

> The LINESIZE parameter is only valid if you specify STYLE(PRINT).

TRUEVALUE

> specifies the text to print for fields that have a Boolean value of TRUE.

text

> specifies the text, which is a maximum of 20 characters. The default is specified
> by the OPTIONS statement TRUEVALUE parameter.

FALSEVALUE

> specifies the text to print for fields that have a Boolean value of FALSE.

text

> specifies the text, which is a maximum of 20 characters. The default is specified
> by the OPTIONS statement FALSEVALUE parameter.

WHEN(*condition***)**

> specifies one of the following for volume selection:

Field List

> specifies the fields to use for volume selection. For a volume to be selected, the
> value for each *field* must match at least one of the provided *values* or *ranges*.

Condition

> specifies a condition for volume selection.

field cond value

> specifies a field, a condition, and a value to compare with one of the
> following conditions:

> **EQ**

> > equal to.

NE

    not equal to.

GE

    greater than or equal to.

GT

    greater than.

LE

    less than or equal to.

LT

    less than.

For example, `VOLSER GE A00243` selects volsers greater than or equal to `A00243`.

field `MATCHES` *mask*

    specifies a field and a mask for selection. The valid masks depend on the field selected:

- `DATASETNAME, BASENAME`: Specify a string in single quotes. Wildcards can be used as follows:

    "**" matches one or more data set qualifiers.

    "*" matches one or more characters within a qualifier.

    "%" matches one character within a qualifier.

- Other character fields: Specify a string in single quotes. Wildcards can be used as follows:

    "*" matches one or more characters.

    "%" matches one character.

For example, `DataSetName MATCHES DR*` selects all data sets with HLQs beginning with `DR`.

booleanfield

    specifies a Boolean field to be tested for TRUE. Specify `NOT` before the field if you want to test for FALSE.

For example, `CLN` selects volumes that are cleaning cartridges.

`NOT`

    reverses the condition that immediately follows the `NOT` keyword.

For example, `NOT CLN` selects volumes that are **not** cleaning cartridges.

```
AND
```
make the selection if both conditions are true.

For example, `NOT CLN AND VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 that are **not** cleaning cartridges.

```
OR
```
make the selection if either condition is true.

For example, `NOT CLN OR VOLSEQ(A00500-A00750)` selects volumes A00500 through A00750 **or** volumes that are not cleaning cartridges.

☞ **Note:** For complete information on the fields available, their types, values, and use, *see ExLM Quick Reference.*

LISTDD

the DD name of a file containing volsers for selection.

ddname
the ddname.

LISTDSN

the data set name of a file containing volsers for selection.

dsname
the data set name.

Note: In the files specified on `LISTDD` or `LISTDSN`:

- For the LSM report, the file should contain an LSMID in the first 5 columns of each record (aa:ll).

- The other reports expect a volser in the first 6 columns. Each volser must start in column 1 on a new line.

    - For `REPORT MVC_VTV`, you must qualify `LISTDD`/`LISTDSN` with 'MVC.' or 'VTV.' to specify whether volumes are MVCs or VTVs.

    - For `REPORT LSM` or `REPORT MVC_VTV`, the volsers are for any volume.

    - Volumes listed in a `LISTDD` or `LISTDSN` file that are not eligible for selection in the statement are not used. For example, if the statement specifies a file that lists volsers 397261, 397263, 397266 and 397263 does not reside in an LSM, it is not used.

```
DETAIL | NODETAIL
```
specifies whether the report includes detail records.

A detail record contains the information specified by the `COLUMN` parameter for one volume. When you specify `DETAIL`, the report includes one detail record for each volume selected by the `WHEN` condition.

☞ **Note:** At least one of the `DETAIL` or `SUMMARY` parameters must be in effect.

SUMMARY | NOSUMMARY
specifies whether the report includes summary records.

SUMMARY specifies that the report includes summary records at the end of a control break to summarize the detail records contained within that control break.

You can override the SUMMARY parameter with the NOSUMMARY subparameter of the CONTROL parameter (and vice versa).

There are four summary types associated with fields for this report:

None
specifies that summary information is not applicable for the field.

Sum
specifies that a standard addition of each reported detail record will be reported. Missing fields will count as 0.

Average
specifies that the average of each reported detail record is reported. Missing fields do not count toward the average.

True
specifies that the count of all Boolean ''true'' records will be reported.

BREAKZERO | NOBREAKZERO

This parameter only applies to MVC_VTV reports and only if the first control field is MVC.serial or VTV.serial and specifies whether a page break occurs for volumes that are not paired.

BREAKZERO (the default) specifies that a control break occurs for volumes that are not paired with any other volumes. This creates a break summary listing information for volumes that would otherwise not appear on the report.

If BREAKZERO is specified and the first control field is MVC.serial, a break will occur if there are zero VTVs for an MVC. If BREAKZERO is specified and the first control field is VTV.serial, a break will occur if there are zero MVCs for a VTV.

The example below requests a page break when the MVC serial changes. For empty MVCs, the page heading lists the MVC, there are no detail lines, and the footing lists 0 as the number of VTVs on the MVC.

```
report mvc_vtv breakzero
  control(mvc.volser
    page('mvc ' || mvc.volser)
    footing(break_count(vtv.volser)
        || ' vtvs for mvc '
        || mvc.volser)
  ) ...
```

If the above example specifies `NOBREAKZERO`, empty MVCs are not included in the report.

`CONTROL`
> specifies the fields where breaks occur and the field sort order.

> ***field***
>> specifies a control field.

>> The volumes selected are sorted based on the control fields. You can use the `BREAK` subparameter to specify that a control break occurs when the value of a control field is different from the same field of the preceding volume.

>> You can specify the `HEADING`, `FOOTING`, and `SUMMARY | NOSUMMARY` subparameters before the first comma without coding a field name. This allows you to specify some text that is printed at the start of the report, at the end of the report, and just before the final summary line. Additionally, you can specify `NOSUMMARY` before the first comma to indicate that no final summary line is printed.

```
CONTROL ( HEADING('Start of Report')

        FOOTING('End of Report')

        SUMMARY('Final Summary Line')

        ,

        field ,

  .

  .

  .

      )
```

> **Control Attr**
>> specifies control information for the preceding control field.

>> `ASCENDING | DESCENDING`
>>> specifies whether to sort the report records in ascending or descending order.

>> `BREAK`
>>> specifies that a control break occurs when the value of the field changes. A control break also occurs for a field if a previously specified field has a control break. You can specify any number of control breaks.

>> `PAGE`
>>> specifies that a page break occurs when the value of field changes. `PAGE` assumes the `BREAK` parameter.

One or more substitution variables can be specified for the control break footing. Any of the fields in the "REPORT VOLUME Statement Fields" section of *ExLM Quick Reference* can be specified by including the full name without quotes. You can use the CONCAT or || parameter to intersperse text and substitution variables.

For example, 'Location' || locationname would print the string 'Location' followed by the contents of the field locationname at the bime of the break.

Expression
    specifies an expression used to create the text.

HEADING
    specifies the control break heading printed at the beginning of the control break when the value of the field changes. HEADING assumes the BREAK parameter.

One or more substitution variables can be specified for the control break footing. Any of the fields in the "REPORT VOLUME Statement Fields" section of *ExLM Quick Reference* can be specified by by including the full name without quotes. You can use the CONCAT or || parameter to intersperse text and substitution variables.

For example, 'Location' || locationname would print the string 'Location' followed by the contents of the field locationname at the bime of the break.

Expression
    specifies an expression used to create the text.

FOOTING
    specifies the control break footing printed at the end of the control break when the value of the field changes. FOOTING assumes the BREAK parameter.

One or more substitution variables can be specified for the control break footing. Any of the fields in the "REPORT VOLUME Statement Fields" section of *ExLM Quick Reference* can be specified by by including the full name without quotes. You can use the CONCAT or || parameter to intersperse text and substitution variables.

For example, 'Location' || locationname would print the string 'Location' followed by the contents of the field locationname at the bime of the break.

Expression
    specifies an expression used to create the text.

SUMMARY | NOSUMMARY
    specifies whether the report includes summary records.

SUMMARY specifies that the report includes summary records at the end of a control break to summarize the detail records contained within that control break.

You can override the SUMMARY parameter with the NOSUMMARY subparameter of the CONTROL parameter (and vice versa).

Expression
specifies an expression used to create the text.

COLUMN
specifies the report columns. You can specify an unlimited number of report columns as long as they do not exceed LINESIZE. This includes column headings as well as detail and summary records. The columns appear in the order that you specify them.

field
specifies the field to include as a column. See the "REPORT VOLUME Statement Fields" section of *ExLM Quick Reference* for field names, aliases, types, sizes, descriptions, summary types, sources, and default headings.

Expression
specifies an expression used to create the text.

Condition
When a condition is specified for a report column (see "WHEN(condition)" on page 95), each volume included in the report is evaluated using the specified condition and the results are printed in the report column.

A condition evaluates to a value of TRUE or FALSE. When printed on the report, the text supplied by TRUEVALUE and FALSEVALUE is used to represent the value of the condition. The defaults are ''YES'' and ''NO'', respectively.

Column Attr
specifies additional column formatting attributes.

FORMAT
specifies a special output format for a field. The valid format types, default output sizes, and examples are listed in the following tables.

Table 47. Valid Formats for Date Fields

Type	Size	Example
yyddd	5	97248
ccyyddd	7	1997248
yy.ddd	6	97.248
ccyy.ddd	8	1997.248
mm/dd/yy	8	09/05/97

Table 47. Valid Formats for Date Fields

Type	Size	Example
mm/dd/ccyy	10	09/05/1997
yy-mm-dd	8	97-09-05
yyyy-mm-dd	10	2000-09-05 This is the default.
dd_mmm_yy	9	09 Sep 97
dd_mmm_ccyy	11	09 Sep 1997
ddmmmyy	7	09Sep98
ddmmmccyy	9	09Sep1997
textdate	18	September 9, 1997
textdaydate	29	Wednesday, September 10, 1997

Table 48. Valid Formats for Time Fields

Type	Size	Example
hh:mm	5	22:21
hh:mm:ss	8	22:21:32 This is the default.
hh:mm:ss_pm	11	10:21:32 PM

GUTTER

    specifies the gutter size between columns.

size

    the gutter size in spaces. Valid values are 1 to 100.   If you specify
STYLE(PRINT), the default gutter is 0 for the first column and 2 for
the other columns. The default gutter is always 0 for STYLE(DATA).

SIZE

    specifies the width of the column in spaces. Valid values are 1 to 100. If
the column data is wider than the width, ExLM truncates the data as
shown in Table 49.

Table 49. Column Truncation Actions

Type	Truncation Results
INT	Fill field with asterisks "*"
CHAR	Print "+" in last printable position
BOOL	Truncate
text	Truncate
DATE	Truncate

Table 49. Column Truncation Actions

Type	Truncation Results
TIME	Truncate

`NODUP`
specifies that, with the exception of the first record in a control break, this column is blank until its value changes or until a control break occurs.

Detail records at the beginning of a control break are not affected by `NODUP`.

`HEADING`
specifies the column heading.

Expression
specifies an expression used to create the text.

Note: There is no default heading for expression and condition columns.

RELATE
specifies the number of columns, beginning with the current one, that should be tied together under a common header.

columns
the number of columns to relate

text
the text to place over the related column headings.The relate text is always printed on the first line of the headings.

The relate text can be as long as the cell sizes of all the related columns plus the gutters between them.

Expression
specifies an expression used to create the text.

field
the field to use.

text
a quoted string supplying the text to use.

function
an ExLM report function. The following ExLM report functions insert text based on parameters you specify.

`SWITCH( Condition , Expression )`
Function `SWITCH` returns the first Expression that follows a true Condition. If no conditions are true, an empty string is returned.

Specify `TRUE` as the last condition if you want to return an Expression when all previous conditions are false.

Note: The following functions are only permitted in `CONTROL` parameters `FOOTING` and `SUMMARY`. They provide summary values for the corresponding break.

BREAK_SUM(*field*)
  Valid for numeric fields. Returns the sum of the values for the field. Missing values are ignored when computing the sum.

BREAK_AVG(*field*)
  Valid for numeric fields. Returns the average of the values for the field. Missing values are ignored when computing the average.

BREAK_COUNT(*field*)
  Valid for all fields. Returns the following count.:

- For conditions and boolean fields this is the count of true values.

- For character fields this is the count of non blank values.

- For integer, date, and time fields, the count is the number of non-missing values.

BREAK_MIN(*field*)
  Valid for all fields. Returns the minimum value of the field.

  Missing values are ignored. For character, values that are all binary zeros or spaces are also ignored. For boolean, FALSE is less than TRUE.

BREAK_MAX(*field*)
  Valid for all fields. Returns the maximum value of the field.

  Missing values are ignored. For character, values that are all binary zeros or spaces are also ignored. For boolean, FALSE is less than TRUE.

Condition
  specifies a condition for selection.

Format Specifier
  specifies the format.

size
  specifies the length of the output space for this value.

LEFT | CENTER | RIGHT
  specifies how the value should be justified within the formatted space.

format
  specifies the format to use.

The formats available are the same as for the COLUMN FORMAT parameter.

If a format specifier is not provided, the default is trimmed using the default format.

If format specifier is specified with size but without justification, the default is right for integer and left for everything else.

CONCAT

concatenates two text strings.

`CONCAT` can also be specified as "`||`".

Custom Report Fields

The information found in the "REPORT VOLUME Statement Fields" or "REPORT LSM Statement Fields" section of *ExLM Quick Reference* allows you to tailor the Volume Report to fit your specific needs. The information found in the table is divided into the following four areas:

- Field
- Type/Size/Summary/Source
- Heading
- Description

where;

Field

These are the choices you specify within the report to display information. For example, if you want to report on the actions taken against each volume reported on, you would specify ACTION as a field on the parameter file for the Volume report.

Type/Size/Summary/Source

This column displays four types of information regarding the corresponding field:

1. TYPE --- displays the type of information displayed according to the demands of the field selected. Type may be any of the following:

   - Boolean (BOOL)
   - Character (CHAR)
   - Date (DATE)
   - Integer (INT)
   - Time (TIME)

   The ACTION field has a TYPE of CHAR, showing that the expected output is a character string.

2. SIZE --- displays the number of spaces required for the output of the corresponding field. This is either a set number or a variable number if the output is not constant.

   The ACTION field has a SIZE of 10, showing that the expected output is no more than ten digits.

3. SUMMARY --- displays whether the corresponding field generates summary records. Summary information is written at the end of a control break to summarize detail records within the control break. Possible summary types are:

   - None, no summary records available

- Sum, standard summary records are produced

- Average, the average of available summary records is produced

- True, the count of all Boolean ''true'' records is produced

The ACTION field has a SUMMARY of None showing that the ACTION field does not generate summary records.

4. SOURCE --- shows the location from which the requested information is gathered. Field sources include:

- HSC, information is received from the HSC CDS

- VSM

- TMS, information is received from your TMS

- ExLM, information is computed by ExLM

- Specific TMSs such as CA-1. For more information, see the Field Tables section for your TMS in *ExLM Quick Reference*.

Heading

Shows the heading that is written at the top of the column for the field selected.

The ACTION field has a HEADING of ''Action''. This is written at the top of the column on each page of the report.

Description

Shows the possible output displayed in the column for the field selected. This description explains the output expected to be produced and displayed when this field is specified in the report parameter file.

The ACTION field has a description specifying that one of the following actions was taken on the specific volume:

- None
- Consolidate
- Eject (volume ejected)
- Move (volume moved)
- Enter (volume entered)
- Keep (volume kept)

You can use the fields found in the table to generate custom reports that report only on the specific needs of your site.

Usage

Use the following guidelines to produce a Custom Report:

- The `PAGESIZE` and `LINESIZE` used for any report ddname must remain the same for all reports written to that ddname.

- You must use different ddnames for `PREACTION` and `POSTACTION` reports.

- `STYLE(DATA)` reports must be written to a ddname not used by any other report.

The `REPORT MVC_VTV` report is identical to the `REPORT VOLUME` report, except:

- There is one detail line for each MVC/VTV combination.

- Volume fields are available on a detail line for both volumes.

- Volume fields can be prefixed with "`VTV.`" or "`MVC.`" to indicate which volume's field is being referred to. The default for non-MVC fields is VTV.

- Parameters `LISTDD` and `LISTDSN` can be qualified with "`MVC.`" or "`VTV.`" to indicate whether the volumes in the list are MVCs or VTVs. The default is "VTV."

- There is one additional parameter on `REPORT MVC_VTV` that is not on the other custom reports – `BREAKZERO/NOBREAKZERO`.

Examples

Custom Volume Reports

The basic form of a condition compares one volume field with a value. For example, to produce a report of only volumes that have gone unreferenced for more than 30 days, specify the following:

```
WHEN(RDAYS GT 30)
```

In general, the `AND` keyword is used to reduce the set of volumes to be included in the report and the `OR` keyword is used to expand the set of volumes to be included in the report. For example, to specify that only volumes that are both in subpool `TEST` and have gone unreferenced for more than 30 days are included in the report:

```
WHEN(SUBPOOL EQ 'TEST' AND RDAYS GT 30)
```

`AND` keywords are processed before `OR` keywords. For example, the following condition specifies that for a volume to be included in the report, it must either be in subpool `TEST1`, or it must be both in subpool `TEST2` and been unreferenced for more than 30 days.

```
WHEN(SUBPOOL EQ 'TEST1' OR SUBPOOL EQ 'TEST2' AND RDAYS GT 30)
```

The following example specifies that volumes in either subpool are included in the report if they have gone unreferenced for more than 30 days.

```
WHEN( (SUBPOOL EQ 'TEST1' OR SUBPOOL EQ 'TEST2') AND RDAYS GT 30)
```

Boolean fields can also be used to reduce the set of volumes included in the report. Both of the following examples specify that all MINENTER volumes and volumes not held for CYCLESOON are included.

```
WHEN(HELDFORMINENTER OR NOT HELDFORCYCLESOON)
WHEN(HELDFORMINENTER EQ TRUE OR HELDFORCYCLESOON EQ FALSE)
```

You can override the `NOSUMMARY` parameter with the `SUMMARY` subparameter of the `CONTROL` parameter (and vice versa). In the following example, no summary lines are printed except when the control break on the associated field occurs.

```
REPORT VOLUME
NOSUMMARY
   .
   .
   .
CONTROL (
   .
   .
   .
       ,
       field  SUMMARY
       ,
   .
   .
   .
           );
```

Figure 96 on page 341 shows an example of a `REPORT VOLUME` statement that generates a report to ddname `ERRANT` of all volumes in the ACS in ERRANT status with volume serial,

cell location, last date/time selected, scratch status and associated data set name. If no volumes are selected, the NORECMSG parameter generates the specified title only. Figure 97 on page 342 shows an example of the report produced by the statement in Figure 96.

```
report          volume                                   // Custom volume report

                DDname(ERRANT)                           // Output ddname

                title( 'Errant Cartridge               // Report title
                Report')

                norecmsg( 'No errant cartridges to report')   // Text if no records match WHEN
                                                               criteria


                       When(                             // Start When condition

                (InLSM EQ True)                          // Volume is in a LSM

                        and                              // And also meets next condition

                   (Errant EQ                            // HSC indicates volume is
                      True)                              errant

                    )                                    // End When Condition

                     Column(                             // Report columns

                        Volume,                          // Field name

                        InitialLSMID,                    // Field name

                        InitialLSMPanel                  // Field name
                        ,

                        InitialLSMColum                  // Field name
                        n,

                        InitialLSMCell,                  // Field name
```

Figure 96. Example REPORT VOLUME Statement

```
2002-06-08                       STORAGE TECHNOLOGY CORPORATION - ExLM 6.2.0          PAGE 6
14:28:08


                                         Errant Cartridge Report

Volume   InitialLSM InitialLSMPan InitialLSMColu InitialLSMCel SelectDa SelectTi Scrat DataSetName
         ID         el            mn             l             te       me       ch

H06907   00:00      18            16             00:00:18:04:1 2002-08- 12:03    Yes   SYSBACK.VOL00
                                                 6             29                      H.DAY
```

Figure 97. Example Custom Volume Report

Custom LSM Reports

The most commonly used form of a condition compares one LSM *field* with a *value*. For example, to produce a report of LSMs that have fewer than 100 free cells, specify the following:

```
WHEN (PLANNEDFREECELLS LT 100)
```

In general, the `AND` keyword is used to reduce the set of LSMs to be included in the report and the `OR` keyword is used to expand the set of LSMs to be included in the report. For example, to specify that only LSMs that have fewer than 100 planned free cells and less than 100 planned scratch volumes are included in the report:

```
WHEN (PLANNEDFREECELLS LT 100 AND PLANNEDSCRATCH LT 100)
```

You can override the `NOSUMMARY` parameter with the `SUMMARY` subparameter of the `CONTROL` parameter (and vice versa). In the following example, no summary lines are printed except when the control break on the associated field occurs.

```
REPORT LSM
NOSUMMARY
                       .
    .
    .
CONTROL (
    .
    .
    .
        ,
        field  SUMMARY
        ,
    .
    .
    .
        );
```

Figure 98 on page 344 and Figure 99 on page 345 show example statements to produce the Custom LSM Report shown in Figure 100 on page 346.

```
report           lsm                                        // This is an LSM report.


                 title( 'LSM Report Summary')               // Title for report.


                      control (
                              heading                        // Heading at top of report
                                        ('Start of Summary Report','')
                              footing                        // Footing at bottom of report
                                        ('End of Summary Report')
                              summary                        // Text before final summary line
                                        ('','Final Totals'),
                              acsid                          // Page break by ACS ID
                                        page                 // with ACSID printed on top of
                                                             page
                                        ('ACS &acsid.')
                                        footing      // Footing on page break
                                        ('End of ACS &acsid.'),
                              lsmgroup break                 // Control Break on LSM group
                                        heading      // Heading on control break
                                        ('LSM Group &lsmgroup.','')
                                        footing      // Footing on control break
                                        ('','End of LSM Group &lsmgroup.','')
```

Figure 98. Custom LSM Report Statements

```
                column (
                        lsmid,                  // LSM ID

                        lsmname,                // LSM Name

                        plannedfreecells        // Planned Free Cells

                                heading         // Column Heading

                                ('Free','Cells')
                                ,

                        plannedscratch          // Total Planned Scratch Volumes

                                heading         // Column Heading

                                ('Scratch'),

                        plannednonscratch       // Total Planned NonScratch
                                                Volumes

                                heading         // Column Heading

                                ('Non-','Scratch
                                '),

                        volumesignored          // Volumes ignored
                        ,

                        plannedejects           // Total Planned Ejects

                                heading         // Column Heading

                                ('Ejects'),

                        plannedmoveins          // Total Planned Move Ins

                                heading         // Column Heading
```

Figure 99. Custom LSM Report Statements (continued)

```
2002-05-1              STORAGE TECHNOLOGY CORPORATION - ExLM              PAGE 1
4                      6.2.0
06:37:21


                       ExLM Demand Run


ACS 00                 LSM Report Summary                                 LSM


LSM        LSM     Free    Scratch  Non-     Volumes  Ejects  Move   Move

ID         Name    Cells            Scratch  Ignored          Ins    Outs

Start of Summary Report

LSM Group Main

00:00      Zero    0       198      30       0        62      0      16

00:01      One     0       218      104      0        109     16     0

Subtotal

                   0       416      134      0        171     16     16

End of LSM Group
Main

LSM Group Storage

00:02      Two     0       176      0        0        45      0      31

00:03      Three   0       215      82       0        58      43     0

00:04      Four    0       229      41       49       117     0      12

Subtotal

                   0       620      123      49       220     43     43

End of LSM Group Storage
```

Figure 100. Custom LSM Report

Chapter 7. ExLM Operator Commands

This chapter describes the operator commands for ExLM.

Using MVS Commands

Using the MVS MODIFY Command to Monitor and Control ExLM Batch Jobs

You use the MVS `MODIFY` command to issue the ExLM `Display`, `Pause`, `REDIRect`, and `Resume` commands.

For example, to display the status of CAP 00:00 for jobname EXLM, enter:

```
f exlm,display cap 00:00
```

Using the MVS STOP Command to Stop ExLM

You can use the MVS `STOP` command to stop ExLM. It will allow in-process operations to complete as follows:

- All volumes currently being ejected are placed in a CAP and must be removed before ExLM stops.
- All volumes currently being moved are placed their destination cells before ExLM will stop.
- All currently scheduled consolidations will complete.

For example, to stop jobname EXLM:

```
p exlm
```

Note: If you enter the `STOP` command a second time, ExLM terminates immediately, without waiting for scheduled actions to complete.

Using the MVS MODIFY Command to Monitor and Control ExLM Agent

The ExLM Agent also uses the MVS `MODIFY` command. For example, to display ExLM Agent status, enter:

`f lcmagent,display`

To change the ExLM Agent maximum concurrent client connections, enter:

`f lcmagent,maxconn` *nn*

where *nn* is the maximum concurrent client connections.

DISPLAY

The `Display` command displays ExLM status, CAP ejects, volume moves, exports and VTV consolidations, migrations, and recalls.

Syntax

```
►►──── Display ────┬──── ALl ──────────┬──────────────────────────►◄
                   │                   │
                   ├──── STatus ───────┤
                   ├──── Cap─capid ────┤
                   ├──── Moves ────────┤
                   ├──── CONSolidations┤
                   ├──── MIGrations ───┤
                   ├──── RECalls ──────┤
                   └──── Exports ──────┘
```
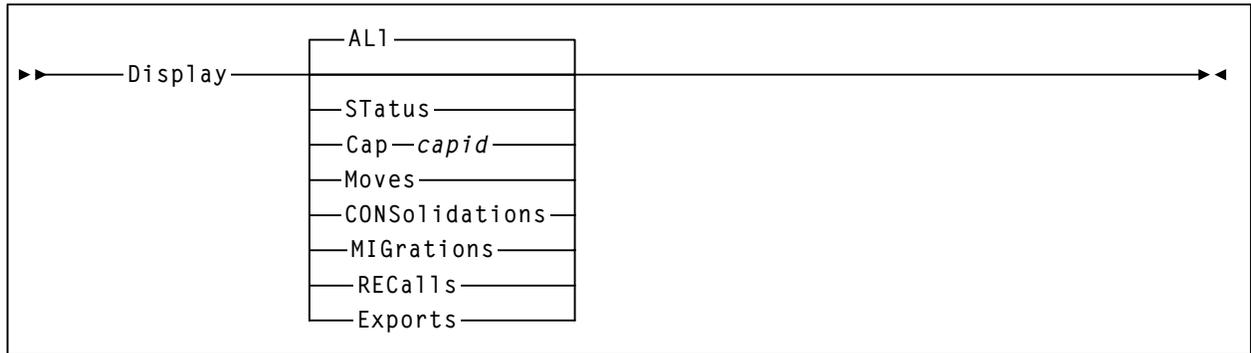
Figure 101. Display Command Syntax

Parameters

ALl
> displays ExLM status, CAP ejects, volume moves, exports and VTV consolidations, migrations, and recalls (the default).

STatus
> displays ExLM status.

Cap
> displays CAP ejects.

> *capid*
>> the CAP ID.

Moves
> displays volume moves.

CONSolidations
> displays VTV consolidations.

MIGrations
> displays VTV migrations.

RECalls
> displays VTV recalls.

Exports
> displays VTV exports.

Usage

Use the `Display` command to display ExLM status, CAP ejects, volume moves, and VTV consolidations, migrations, and recalls.

Examples

To display ExLM status for jobname `EXLMJOB1`:

        F EXLMJOB1, D ST

Output

Figure 102 shows the output from a `F EXLMJOB1, D ALL` command.

```
18.48.08 JOB 6343 LCM4013I ExLM command: DISPLAY
18.48.08 JOB 6343 LCM4007I Performing EJECTs and MOVEs.
18.48.08 JOB 6343 LCM4010I Moves are active for ExLM.
18.48.08 JOB 6343 LCM4103I Moving B01560 to 00:00 from 00:02.
18.48.08 JOB 6343 LCM4103I Moving C03790 to 00:01 from 00:00.
18.48.08 JOB 6343 LCM4103I Moving C02760 to 00:03 from 00:02.
18.48.08 JOB 6343 LCM4011I Moves: Completed=43 Remaining=61.
18.48.08 JOB 6343 LCM4010I VTV Consolidations are active for ExLM.
18.48.08 JOB 6343 LCM4051I Consolidating v00208 for group VVault1.
18.48.08 JOB 6343 LCM4051I Consolidating v03937 for group VVault2.
18.48.08 JOB 6343 LCM4051I Consolidating v02873 for group VVault3.
18.48.08 JOB 6343 LCM4049I VTV Consolidations: Completed=211
Remaining=38.
18.48.08 JOB 6343 LCM4008I CAP 00:00:00 in use by ExLM. Location Vault
18.48.08 JOB 6343 LCM4009I CAP 00:00:00 Ejects: Completed=0 Remaining=65.
18.48.08 JOB 6343 LCM4008I CAP 00:00:01 in use by ExLM. Location Vault
18.48.08 JOB 6343 LCM4009I CAP 00:00:01 Ejects: Completed=0 Remaining=48.
18.48.08 JOB 6343 LCM4008I CAP 01:00:00 not in use by ExLM.
```

Figure 102. Sample Output from a Display Command

PAUSE

The `Pause` command suspends CAP ejects, volume moves, exports and VTV consolidations, migrations, and recalls.

Syntax

```
                  ┌─AL1─────────┐
►►──Pause─────────┤             ├────────────────────────────────►◄
                  │ ┌─Cap─────┐ │
                  │ │  ┌capid┐ │ ┌IMMED┐ │
                  │ │  └─────┘ │ └─────┘ │
                  │ ├─Moves───┤ │
                  │ ├─CONSolidations─┤ │
                  │ ├─MIGrations─────┤ │
                  │ ├─RECalls────────┤ │
                  │ └─Exports────────┘ │
```
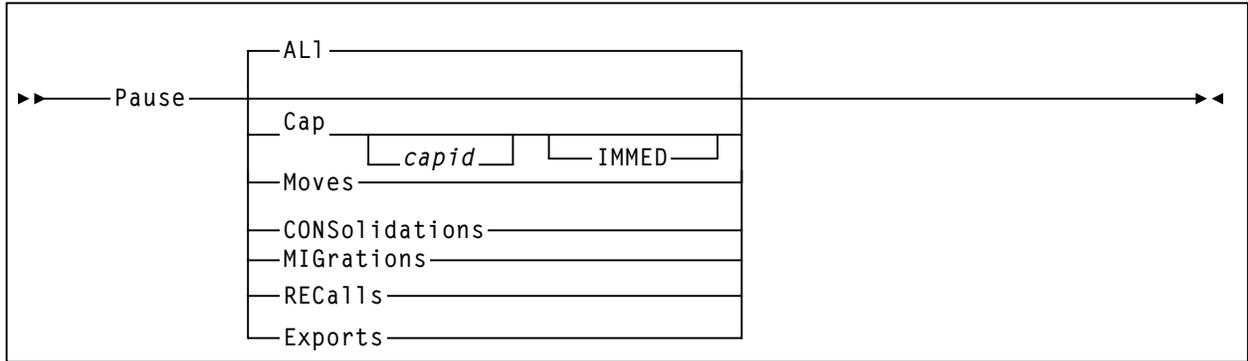
Figure 103. Pause Command Syntax

Parameters

AL1
> suspends CAP ejects, volume moves, exports and VTV consolidations, migrations, and recalls (the default).

Cap
> suspends CAP ejects after scheduled ejects complete.

> *capid*
> > the CAP ID. If not specified, ExLM suspends activity for all CAPs.

> IMMED
>
> > immediately suspends CAP ejects.

Moves
> suspends volume moves after in-process moves complete.

CONSolidations
> suspends VTV consolidations.

MIGrations
> suspends VTV migrations.

RECalls
> suspends VTV recalls.

Exports
> suspends VTV exports.

Usage

Use the `Pause` command to suspend CAP ejects, volume moves, and VTV consolidations, migrations, and recalls. Use the `Resume` command to resume suspended activities; for more information, see "RESUME" on page 354.

Note: If you enter a `P CONS` command, ExLM issues message `LCM4120E` because ExLM cannot interrupt active consolidation requests and must wait for them to complete before it can stop or pause as requested. ExLM also issues messages `LCM4121E` and `LCM4122E` that tell how to interrupt scheduled consolidation requests, then continues waiting for the consolidations to complete.

Hint: If volume moves are tying up the robot and slowing down ejects, suspend moves until ejects occur more quickly.

Examples

To immediately suspend CAP ejects for jobname `EXLMJOB1`:

```
F EXLMJOB1, P C IMMED
```

Output

Figure 104 shows the output from a `F EXLMJOB1, P M` command.

```
18.50.11 JOB 6343  LCM4010I Moves by ExLM are paused.
18.50.11 JOB 6343  LCM4011I Moves: Completed=0 Remaining=61.
```

Figure 104. Sample Output from a Pause Command

REDIRECT

The `REDIRect` command redirects ejects from a CAP in one LSM to a CAP in another LSM.

Syntax

```
►►───────REDIRect────────fromlsmid────────tolsmid─────────────────────────────►◄
```
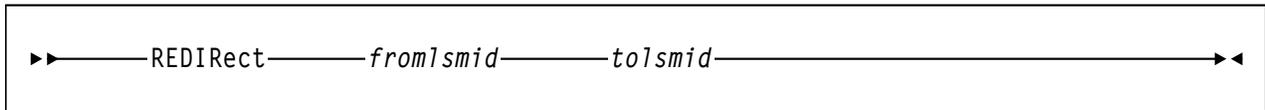
Figure 105. REDIRect Command Syntax

Parameters

fromlsmid
> redirects CAP ejects from this LSM.

tolsmid

> redirects CAP ejects to this LSM.

Usage

Use the `REDIRect` command to redirect ejects from a CAP in one LSM to a CAP in another LSM (for example, if the first LSM or its CAP go offline).

Examples

To redirect ejects from a CAP in LSM 00:01 to a CAP in LSM 00:00:

```
F EXLMJOB1, REDIR 00:01 00:00
```

Output

Figure 106 shows the output from a `F EXLMJOB1, REDIR` command.

```
18.50.11 JOB 6344  LCM4032I Ejects planned for CAP 00:01
have been redirected to CAP 00:00.
```

Figure 106. Sample Output from a REDIR Command

RESUME

The `Resume` command resumes CAP ejects, volume moves, VTV exports, migrations, recalls, and consolidations.

Syntax

```
                  ┌─AL1──────────────┐
►►──Resume────────┤                  ├──────────────────────────►◄
                  │  Cap             │
                  │      └─capid─┘   │
                  ├─Moves────────────┤
                  ├─CONSolidations───┤
                  ├─MIGrations───────┤
                  ├─RECalls──────────┤
                  └─Exports──────────┘
```
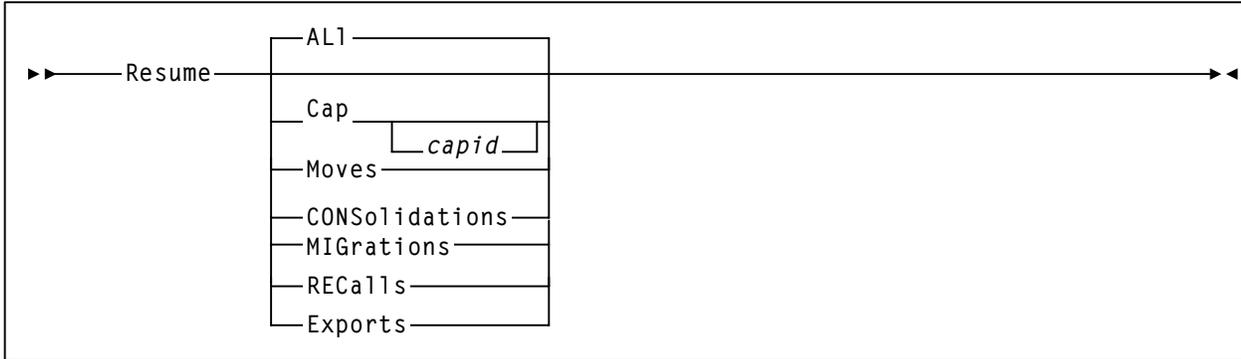
Figure 107. Resume Command Syntax

Parameters

AL1
> resumes CAP ejects, volume moves, and VTV consolidations (the default).

Cap
> resumes CAP ejects.

> *capid*
> > the CAP ID.   If not specified, ExLM resumes activity for all CAPs.

Moves
> resumes volume moves.

CONSolidations
> resumes VTV consolidations.

MIGrations
> resumes VTV migrations.

RECalls
> resumes VTV recalls.

Exports

> resumes VTV exports.

Usage

Use the `Resume` command to resume CAP ejects, volume moves, and VTV consolidations, migrations, and recalls. `Resume` also starts any specified activity that has not already started.

Examples

To resume CAP ejects for jobname `EXLMJOB1`:

`F EXLMJOB1, R C`

Appendix A. ExLM SAMPLIB Members

The ExLM SAMPLIB member `LCMINDEX` contains the members described in Table 50.

Table 50. ExLM SAMPLIB Members

Member	*Description*
LCMACC	Sample control statement for SMP/E ACCEPT.
LCMAGENT	Sample ExLM Agent started task procedure.
LCMAPC	Sample control statement for SMP/E APPLY CHECK.
LCMAPFXX	Sample ExLM authorized library list entry.
LCMAPL	Sample control statement for SMP/E APPLY.
LCMCGI	Sample CGI script for TMS OPEN interface.
LCMCHGS	Cumulative documentation changes for the release as PTFs are applied
LCMCODES	Sample ExLM Agent access code file.
LCMEJECT	Sample JCL procedure for the ExLM eject utility.
LCMEXEC	Sample JCL procedure for use with jobs submitted by the ExLM Explorer, as well as other ExLM jobs submitted by an installation. **LCMEXEC** pre-defines certain items that are common to all ExLM runs at the installation.
	For example, if ExLM is installed in a library that is not included in the linklist or LPA list, **LCMEXEC** should have a STEPLIB pointing to the production ExLM load library.
	DD statements that are dynamically allocated by most ExLM jobs or are different from one ExLM job to the next should not be in **LCMEXEC**.
LCMINSTx	Sample jobs that can be used to install ExLM in its own set of SMP/E zones and data sets.
	Note: Use of the LCMINSTx jobs is optional and is not intended to suggest how you should install ExLM. The operation of these jobs is not in any way coordinated with the installation steps documented in the "ExLM Installation Instructions" and should not be intermixed with those instructions.

Table 50. ExLM SAMPLIB Members

LCMKST	Documents the key values for each extended field. **LCMKST** contains a list of equates for all extended fields. All extended fields will have a key greater than 0 associated with them. For more information, see "Guidelines for Producing TMCI Records" in Appendix C. Data Areas of *ExLM User's Guide*.
LCMMTHF	Macro for defining the layout of a method file record. For more information, see "METHODFILE Record" in Appendix C. Data Areas of *ExLM User's Guide*.
LCMRCV	Sample control statement for SMP/E RECEIVE.
LCMRPTF	Sample JCL to receive PTFs from a PUT tape.
LCMRUN	Sample JCL to run ExLM.
LCMSMPE	Sample SMP/E JCL procedure used with LCMINSTx jobs.
LCMTIDR	Sample TMS Interface Definition Response xml document.
LCMTMCI	Macro for defining the layout of an ExLM TMC information record.
LCMTTIR	Sample TMS Tape Information Response XML document used with the TMS OPEN interface.
LCMUX01P	Macro for defining the parameter list used by the ExLM TMS CUSTOM interface. For more information, see "TMS CUSTOM Interface Module Parameters" in Chapter 3 of the *User's Guide*.
LCMUX01S	Sample assembler program for use with the ExLM TMS CUSTOM interface.
LCMVAUTM	ExLM parameter file for IVP with Automedia.
LCMVCA1	ExLM parameter file for IVP with CA-1.
LCMVCOMM	ExLM parameter file for IVP with common-format TMS extract files.
LCMVCONT	ExLM parameter file for IVP with Control-T
LCMVCUST	ExLM parameter file for IVP with ExLM custom tape management system interfaces (a tape management system vendor supplied user exit is required).
LCMVNTMS	ExLM parameter file for IVP without a TMS.
LCMVRMM	ExLM parameter file for IVP with DFSMSrmm.
LCMVTLMS	ExLM parameter file for IVP with CA-TLMS.
LCMXDMD	ExLM parameter file for demand (or shift) run.
LCMXDVLD	ExLM parameter file for vaulting run with special data sets.
LCMXDVLS	ExLM parameter file for vaulting run with multiple subpools.
LCMXDVLT	ExLM parameter file for daily vaulting run

Table 50. ExLM SAMPLIB Members

LCMXRAC1	ExLM parameter file for a post action report.
LCMXREJ1	ExLM parameter file for an eject report that includes data set name.
LCMXREJ2	ExLM parameter file for a report of volumes ejected for need by data set name.
LCMXREN1	ExLM parameter file for a report of volumes on a Pull List that were not already in an LSM.
LCMXRMT1	ExLM parameter file for a summary report with counts of several methods.
LCMXRSM1	ExLM parameter file for an LSM summary report.
LCMXRSR1	ExLM parameter file for a non-LSM scratch list report.
LCMXRVR1	ExLM parameter file for a report of all volumes with HSC and TMS information.
LCMXSYNC	ExLM parameter file for scratch synchronization
LCMXTMUL	REPORT MULTIPLE template
LCMXTPHY	REPORT PHYSICAL template
LCMXTVIR	REPORT VIRTUAL template

Appendix B. A Sample ExLM Workflow

For both Nearline and VSM resources, you can obviously do just about any management task you want using ExLM. In this appendix, we'll show a sample workflow Table 51 for a simple 2-LSM ACS using a combination of ExLM parameter file examples and parameter file samples provided in the ExLM SAMPLIB, which are described in Table 50 on page 357. In most cases, you'll note that there's usually a TMS statement in the parameter file because your TMS provides a variety of useful information that ExLM can use to do management tasks.

Table 51. A Sample ExLM Workflow

Task	Notes
Run a volume report that shows HSC and TMS information for all volumes managed by ExLM.	Use SAMPLIB member `LCMXRVR1`.
Do scratch synchronization.	See "Scratch Synchronization Parameter File" on page 362 for an example or use SAMPLIB member `LCMXSYNC`. Rerun the volume report to see the results.
Run a report to see the planned activity for the site.	See "Basic "Manage" Parameter File" on page 363. Create a file like this for your site, modify the LSM report in member `LCMXRSM1`as needed and add the report to the Basic Manage File to get a report of the planned real and virtual activity.
The planned activity doesn't do what I want, run a stock management file to adjust resources...	...as described in "Manage File to Adjust Resources" on page 364.
I've just run the TMS vaulting procedure, and I want ExLM to facilitate the "eject to vault" operation...	...as described in "Parameter File for Vaulting Run" on page 365. You might also want to review the eject report with the volumes to be ejected. An operator report will have any details for the operator.

Scratch Synchronization Parameter File

Figure 108 shows a parameter file to synchronize the HSC CDS scratch status of real and virtual volumes with the scratch status in the TMS. You typically run this job, therefore, after a TMS update.

```
options
title ('Scratch Synchronization Parameter File')
sync
syncvtv;

tms ca1
name('CA1SITE1')
tmcdsn(ca1.tmc)
agent(123.123.123.123 3002);

manage physical acsid(00);
manage virtual;
```

Figure 108. Scratch Synchronization Parameter File

Basic "Manage" Parameter File

Figure 109 shows a basic manage parameter file. Because I have only a two-LSM ACS, I can usually manage it at the ACS level. The MANAGE PHYSICAL statement, therefore, is simple and at the ACS level: all I want to do is globally identify the physical resources I'm managing so I can get a report for a sanity check of the planned actions.

```
options
title ('Basic Manage Parameter File')
check
external(nevereject uncond)
ejcap (00:00 00:01);

tms ca1
name('CA1SITE1')
tmcdsn(ca1.tmc)
agent(123.123.123.123 3002);

manage physical acsid(00)
manage virtual;

// Modified LSM report from LCMXRSM1 goes here //
```

Figure 109. Basic "Manage" Parameter File

Manage File to Adjust Resources

Figure 110 shows a manage file to adjust resources. The report I ran in "Basic "Manage" Parameter File" on page 363 showed that I had less than optimal balances of scratch volumes, cleaning cartridges, and free cells across the two LSMs in my ACS. To clean things up, I run the stock "manage to rebalance" file shown in Figure 110.

```
options
title ('Manage File to Adjust Resources')
external(nevereject uncond)
ejcap (00:00 00:01);

tms ca1
name('CA1SITE1')
tmcdsn(ca1.tmc)
agent(123.123.123.123 3002);

manage physical acsid(00)
balscr(10)
balcln (2)
balfree(10);

manage virtual;
```

Figure 110. Manage File to Adjust Resources

Parameter File for Vaulting Run

Figure 111 shows a parameter file to physically eject volumes from the ACS per the policies specified in the TMS vaulting run.

```
options
title ('Parameter File for Vaulting Run')
external(nevereject uncond)
ejcap (00:00 00:01);

tms ca1
name('CA1SITE1')
tmcdsn(ca1.tmc)
agent(123.123.123.123 3002);

manage physical acsid(00);

method name(vault) eject(yes);

location code(vlt1)  name(Vault1)  method(vault) slots;
location code(arch)  name(Archive) method(vault) slots;
location code(' ' ' VMS')    name(Local) noslots;
```

Figure 111. Parameter File for Vaulting Run

In Figure 111, note the following:

- I defined a method (vault) and said "any volumes with this method, eject them unconditionally."

- I created 3 LOCATION statements, which defined the following CA1 VMS vault names to ExLM:

  - Statements for VMS user-defined vaults vlt1 and arch (in CA1, vault names are considered location codes), which I've named Vault1 and Archive to ExLM. When VMS schedules the volume for vaulting, these vault codes are applied to the volume, and method vault ejects the volumes by TMS slot number.

  - The remaining LOCATION statement says "For the main library (denoted by the blank) and the VMS-defined vault VMS, don't do anything."

Appendix C. The ExLM Eject Utility

The ExLM Eject Utility dynamically invokes the HSC `SLUADMIN` Eject Cartridge Utility to eject volumes specified in an input data set. The ExLM Eject Utility can execute as a started task or a batch job and can be paused and resumed.

Hint: In general, StorageTek recommends that you use an ExLM main task batch job instead of the Eject Utility to eject volumes.

Caution: The ExLM Eject Utility uses only CAP00 on LSMs with enhanced CAPS, and does **not** use CAP01.

Eject Utility Input Data Set

The Eject Utility input data set can be an in-stream or sequential data set or a PDS member with RECFM=FB, LRECL=80, and any suitable block size (for example, BLKSIZE=6160).

Figure 112 shows an example of an Eject Utility input data set.

```
*Please hold the cartridges now being ejected near the console area

AA4918

AA5839

CR8821

MMØ472

*Please package the cartridges now being ejected for the 1Ø a.m. courier

TYØ191

TYØ223

TYØ917

TY1Ø13

TY2444

TY4651
```

Figure 112. Eject Utility Input Data Set

As Figure 112 shows, the Eject Utility input data set consists of two types of records:

console message record
specifies messages about the ejected volumes for display on the system console that describe the eject operation. ExLM issues these console messages as:

    LCM9ØØ5I: LCM9ØØ5I *jobname message-text*

Console message records begin with an asterisk (*) in column 1, the message text begins in column 2 and is a maximum of 79 characters.

volser record
specifies the volser to be ejected. Create one volser per line, beginning in any column.

As shown in Figure 112, you must create one or more batches of volumes for ejection, where the first record in a batch is a console message record followed by volser records. You can create an unlimited number of record batches in an input data set.

Eject Utility JCL Procedure

You can customize SAMPLIB member `LCMEJECT` to run the ExLM Eject Utility; for more information, see Appendix A, "ExLM SAMPLIB Members" on page 357. The `LCMEJECT` JCL procedure has the following symbolic parameters:

`CAP`

> specifies a suffix for the name of a temporary data set created for DD statement SLSIN. This value is only required if you want to run two or more `LCMEJECT` procedures simultaneously; in that case, specify a unique LSM value for each procedure executed as shown in the following example:
>
> > `CAP=ØØØ`

`EJUNIT`

> specifies a DASD device class to which temporary data sets created for the SLSIN DD statement are allocated. If not specified, the default is SYSALLDA. For example:
>
> > `EJUNIT=338Ø`

`EJECTS`

> specifies the name of an Eject Utility input data set (required).   Specify the data set name in all capital letters and enclose it in single quotes, for example:
>
> > `EJECTS='LSMØØ1.EJECT.FILE'`

`OPTIONS`

> specifies one or more of the following:
>
> `CAP`
>
> > specifies one or more LSMs for ejection. Enclose a list of LSMs in parentheses and use spaces to separate unique hexadecimal LSM IDs. The Eject Utility always selects CAP 00 of the specified LSM.
>
> `UPPER`
>
> > specify `UPPER` to print all output in uppercase; the default is mixed case.
>
> `CAPSIZE`
>
> > specifies the number of eject requests passed to SLUADMIN at one time. The default value for `CAPSIZE` is 21. `CAPSIZE` is only valid if you specify a single CAP on the `CAP` parameter and is ignored if you specify multiple CAPs.

```
PROMPT
```
specifies that the Eject Utility displays the following console message:

```
LCM9011I CAPxxx Reply 'Y' when ready for EJECT processing to
  begin.
```
The Eject Utility will not invoke SLUADMIN to begin ejecting volumes until an operator responds to this message.

In the following example, the `OPTIONS` parameter specifies ejects through LSMs 00:00, 00:01, and 00:02, and prompts the operator to confirm eject processing:

```
OPTIONS='CAP(00:00 00:01 00:02) PROMPT'
```

Running the Eject Utility Procedure

The following sections tell how to run the Eject Utility procedure as a batch job or a started task. The Eject Utility writes the volser of each cartridge ejected to its SYSPRINT data set. Error messages, if any, are also written to the SYSPRINT data set.

Running the Eject Utility as a Batch Job

Figure 113 shows sample JCL to run the Eject Utility procedure (`LCMEJECT`) as a batch job. Shown in the following example are JCL statements to invoke the Eject Utility as a batch job. In this example, the input data set `EJECT.INPUT.FILE` specifies volumes to be ejected from CAP 00:02, and the utility prompts the operator to confirm the ejects.

```
//EJECTUTL JOB (ACCOUNT),PROGRAMMER

//S1      EXEC LCMEJECT,OPTIONS='CAP(00:02) PROMPT'

//LCMEJECT.SYSIN  DD DSN=EJECT.INPUT.FILE,DISP=SHR

//
```

Figure 113. Sample JCL to run the Eject Utility Procedure as a Batch Job

Running the Eject Utility as a Started Task

You can use the MVS `START` command to run the Eject Utility as a started task as shown in the following example:

```
START LCMEJECT,OPTIONS='CAP(00:02) PROMPT',EJECTS='EJECT.INPUT.FILE'
```

You can also start `LCMEJECT` with a unique job identifier as shown in the following:

```
START
  LCMEJECT.job-id,OPTIONS='CAP(00:02)PROMPT',EJECTS='EJECT.INPUT.FILE'
```

where *job-id* is a user-provided job identifier for jobname `LCMEJECT`.

Controlling the Eject Utility

You use MVS operator commands to control the Eject Utility. To pause the Eject Utility, use the `MODIFY` command:

```
MODIFY job-id,PAUSE
```

The Eject Utility pauses after ejecting the current batch of volumes. After you pause the Eject Utility you can issue HSC operator commands, such as enter and eject commands.

 To resume the Eject Utility, use the `MODIFY` command:

```
MODIFY job-id,RESUME
```

If you need to stop the Eject Utility before all ejects in the input file complete, do the following:

1. Use MVS `MODIFY` to pause the Eject Utility.

2. Wait for the current CAP eject to complete.

3. Use MVS `CANCEL` to cancel the utility.

The Eject Utility does *not* honor the MVS `STOP` command.

Responding to SLUADMIN Reported Problems

A non-zero return code from SLUADMIN causes the Eject Utility to display the following console message:

```
LCM9010E HSC EJECT utility suffered critical error. Reply 'RETRY',
'CANCEL', or 'CONTINUE'.
```

- Enter `RETRY` to retry the Eject Utility with the same list of volumes.
- Enter `CANCEL` to cancel the request.
- Enter `CONTINUE` to move to the next batch in the input file.

The Eject Utility only receives a return code from SLUADMIN for the entire batch, not for each individual volume. See the report written to the SLSPRINT DDname for more information.

Appendix D. Data Areas

This appendix describes the following ExLM data areas:

- "TMCI Record" on page 373
- "METHODFILE Record" on page 380

TMCI Record

The TMCI is a variable length record that the TMS Common and Custom interfaces use to provide ExLM with TMS information about a single volume as described in the following sections:

- "Guidelines for Producing TMCI Records" on page 374
- "TMCI Record Layout" on page 375
- "TMCI Record Date Formats" on page 377
- "TMCI Record Time Formats" on page 378
- "TMCI Record Boolean Formats" on page 378
- "TMCI_EXPIREDATE Special Formats" on page 379

Guidelines for Producing TMCI Records

Use the following guidelines to produce TMCI records for the TMS CUSTOM and COMMON interfaces:

- TMS COMMON files must be variable length sequential data sets, where each logical record in the TMS COMMON data set is one TMCI record.

- TMS CUSTOM interface modules must prefix TMCI records with a record descriptor word. The record descriptor word consists of a signed halfword length value followed by a halfword of zeros.

- To initialize a TMCI record before populating its fields for a specific volume, StorageTek recommends that you first clear the entire record with binary zeros and then set character fields to blanks.

- The minimum requirement is to produce TMCI records long enough to contain all fields up to and including the `TMCI_REFDATE` field. Shorter TMCI records will cause unpredictable results at best and may cause catastrophic errors.

  Some fields in the TMCI record are optional, but you should supply as much information as possible for each volume, including "residual data" for scratch volumes and expired volumes. If possible, produce full length TMCI records with values for "information not provided" for fields with no information for the data types described in Table 52.

Table 52. TMCI Values "Information Not Provided"

Type	Value for "Information Not Provided"
BIN	Binary zeros
CHAR	Blanks
DATE	The date format (first byte) must be binary zeros. Remaining bytes of DATE fields are irrelevant, but it is often easiest to clear the entire field.

- For nonscratch volumes, ExLM assumes that the value of `TMCI_DSNAME` contains a valid (not missing) data set name. If nonscratch volumes in a specific TMS can have data set names that are blank or otherwise invalid, you must modify the TMCI records for these volumes to supply a valid data set name. Otherwise, you cannot pass TCMI records for these volumes to ExLM.

- If you specify the `TMS` statement `EJBAD` option, the TCMI records must pass information about defective volumes to ExLM.

- Note that ExLM 5.0.0 and above provides extended fields in the TMCI, which have the prefix `TMCI_EFV`. SAMPLIB member `LCMKST` lists the equates for these extended fields; for more information, see "ExLM SAMPLIB Members" on page 357.

TMCI Record Layout

Table 53 describes the TMCI record layout. SAMPLIB member `LCMTMCI` is an assembler mapping macro for the TMCI.

Table 53. TMCI Record Layout

Field	Offset	Column	Type	Len	Description
TMCI_START	0 (00)		DSECT		Start of TMCI record.
TMCI_LENGTH	0 (00) 2 (02)		BIN BIN	2	Length of TMCI record, including this field. Reserved. Should be binary zeroes.
TMCI_DATA	4 (04)			2	This label indicates the beginning of the data portion of the TMCI record.
TMCI_VOLSER	4 (04)	1	CHAR	6	Volser for the volume for which information is being provided.
TMCI_SCRATCH	10 (0A)	7	CHAR	1	Scratch indicator. If C'Y', this volume is scratch; otherwise, it is not.
TMCI_SITE	11 (0B)	8	CHAR	8	Out-of-area code, or location code.
TMCI_SLOT	19 (13)	16	CHAR	8	Slot number assigned to this volume.
TMCI_REFDATE	27 (1B)	24	DATE	13	Date volume was last referenced. **Note:** Refer to "TMCI Record Date Formats" on page 377 for information on the supported date formats.
TMCI_CREATEDATE	40 (28)	37	DATE	13	Creation date of data set on volume. **Note:** Refer to "TMCI Record Date Formats" on page 377 for information on the supported date formats.
TMCI_DSNAME	53 (35)	50	CHAR	44	Data set name of controlling data set for volume.
TMCI_USE	97 (61)	94	BIN	4	Volume use count. Zero, or a positive fullword integer.
TMCI_VOLSEQ	101 (65)	98	BIN	4	Volume sequence number. Must be a signed fullword between 0 and 32767.
TMCI_EXTERNAL	105 (69)	102	CHAR	1	Externally managed indicator. If C'Y', the volume is managed by an external data manager.
TMCI_TAPE_TYPE	106 (6A)	103	CHAR	1	Type of media. 9-track (C'0') or cartridge (C'1').
TMCI_CREATETIME	107 (6B)	104	CHAR	5	Creation time in the format 'HH:MM', based on a 24 hour clock.
TMCI_CYCLEDATE	112 (70)	109	DATE	13	Estimated expiration date of volume. ExLM will use this date to implement the `CYCLESOON` option. **Note:** Refer to "TMCI Record Date Formats" on page 377 for information on the supported date formats.
TMCI_FIRSTVOL	125 (7D)	122	CHAR	6	Volser of the first volume in this volume's volume-set.

Table 53. TMCI Record Layout

Field	Offset	Column	Type	Len	Description
TMCI_BAD	131 (83)	128	CHAR	1	Bad (or damaged) volume indicator. If C'Y', the volume has been marked as having defective media by the TMS. If the EJBAD option has been coded in the ExLM parameter file, volumes that reside in a managed LSM and have a C'Y' in this field will be unconditionally ejected.
TMCI_EXPIRED	132 (84)	129	CHAR	1	Expired volume indicator. If C'Y', the volume has been marked as expired in the TMS. Expired volumes are automatically classified as CYCLESOON volumes by ExLM.
TMCI_JOBNAME	133 (85)	130	CHAR	8	Creating jobname.
TMCI_STEPNAME	141 (8D)	138	CHAR	8	Creating stepname.
TMCI_EXPIREDATE	149 (95)	146	DATE	13	Expiration date of volume (unchanged). A special date format of x'99' (p'153') can be used only by this field to print decoded keywords such as 'Catalog' or 'Permanent' on the REPORT VOLUME. **Note:** Refer to "TMCI Record Date Formats" on page 377 and "TMCI_EXPIREDATE Special Formats" on page 379 for information on the supported date formats.
TMCI_MGMTCLAS	162 (A2)	159	CHAR	8	SMS Management Class. Used only in ExLM 2.1 and above.
TMCI_LOCDATE	170 (AA)	167	DATE	13	Specifies the date the volume was moved to a tape storage location.
TMCI_DELETED	183 (B7)	180	CHAR	1	If marked 'Y', deleted from the TMS.
TMCI_EFV_OFFSET	184 (B8)	181	BIN	2	Offset: (TMCI_EFV_FIRST to TMCI_DATA_START)
TMCI_EFV_COUNT	186 (BA)	183	BIN	2	Number of extended fields.
TMCI_EFV_FIRST	188 (BC)	185	BIN	2	Start of first field value, mapped by TMCI_EFV_FIELD (see below). Do not reference this tag directly except to calculate TMCI_EFV_OFFSET.
TMCI_EFV_FIELD					Extended field.
TMCI_EFV_ID			BIN	2	Extended field key ID (greater than 0).
TMCI_EFV_VALUE_SIZE			BIN	2	Size of field value.
TMCI_EFV_VALUE			BIN	variable	Field value.
TMCI_MAXIMUM_L			EQU	4096	Equate symbol equal to the length of a fully populated TMCI record, including the record descriptor word and extended fields.

TMCI Record Date Formats

Table 54 describes the date formats that the TMCI supports. Date field begins with a one byte date format value, followed by a date value up to twelve (12) bytes in length. The TMCI record DSECT provides equate symbols (EQU) for each supported date format value.

Table 54. TMCI Record Date Formats

Type	Equate Symbol	Date Format	Example
0	TMCI_DATE_NOT_PROVIDED	Date not provided	AL1(0)
2	TMCI_JULIAN	Full Julian	AL1(2),C'1989359'
3	TMCI_JULIAN_DECIMAL	Full Julian	with decimal AL1(3),C'1989.359'
4	TMCI_PACKED_JULIAN	4-byte packed decimal Julian	AL1(4),PL4'1989359'
6	TMCI_SHORT_JULIAN	Short Julian (1900's assumed)	AL1(6),C'89359'
7	TMCI_SHORT_JULIAN_DECIMAL	Short Julian with decimal	AL1(7),C'89.359'
11	TMCI_SHORT_GREGORIAN	Short Gregorian	AL1(11),C'12/25/89'
12	TMCI_GREGORIAN	Gregorian	AL1(12),C'12/25/1989'
13	TMCI_SORTABLE	Sortable	AL1(13),C'1989-12-25'
14	TMCI_SHORT_SORTABLE	Short sortable	AL1(14),C'89-12-25'
31	TMCI_SHORT_NORMAL	Short REXX normal	AL1(31),C'25 Dec 89'
32	TMCI_NORMAL	REXX normal	AL1(32),C'25 Dec 1989'
33	TMCI_SASDATE7	SAS DATE7.	AL1(33),C'25DEC89'
34	TMCI_SAS_DATE9	SAS DATE9.	AL1(34),C'25DEC1989'
153	TMCI_SPECIAL	Special 4-byte packed decimal	AL1(153),PL4'9999999'

TMCI Record Time Formats

Table 55 describes the time formats that the TMCI supports. Time fields begin with a one byte date format value, followed by a time value up to eight (8) bytes in length. The TMCI record DSECT provides equate symbols (EQU) for each supported time format.

Table 55. TMCI Time Formats

Type	Equate Symbol	Time Format	Example
0	TMCI_TIME_NOT_PROVIDED	Time not provided.	AL1(0)
2	TMCI_HUNDREDTHS	4-byte binary integer equal to the number of .01-second units since midnight	AL1(2),F'3115074
3	TMCI_HHMM	Time in hours and minutes.	AL1(3),C'13:03'
4	TMCI_HHMMSS	Time in hours, minutes, and seconds.	AL1(5),C'13:03:40.40'
6	TMCI_CIVILIAN	Time in hours, minutes, and seconds followed by an AM/PM indicator.	AL1(6),C' 1:03:40 AM'
7	TMCI_TODCLOCK	System/370 time-of-day clock format.	AL1(7),XL8'TOD Value'
17	TMCI_SECONDS_SINCE_1970	4-byte binary integer equal to the number of seconds since Jan 1, 1970, 00:00:00.0.	AL1(17),F'3532715'

TMCI Record Boolean Formats

Table 56 describes the Boolean formats that the TMCI supports. Boolean values are coded as a single byte; use "Y" for true and "N" for false.

Table 56. TMCI Record Boolean Formats

Equate Symbol	Boolean Value	Example
TMCI_TRUE	BOOLEAN value for TRUE.	C'Y'
TMCI_FALSE	BOOLEAN value for FALSE.	C'N'

TMCI_EXPIREDATE Special Formats

Table 57 describes the TMCI format `TMCI_SPECIAL`. The first column contains the packed decimal number in the TMCI. Any lower case alphabetic 'nnn' indicates any decimal number must be substituted. The second column describes the decoded keywords that will print in a `REPORT VOLUME` for the `EXPIREDATE` field. If you want the decoded keyword to print, you must provide the exact 4 byte packed value described in the table.

Table 57. TMCI_EXPIRATEDATE Decoded Values

4 Byte Packed Decimal Number	Decoded Keyword
9988nnn	User/nnn
9989nnn	Stats/nnn
9990000	Catalog
9990nnn	Catlg/nnn
9991nnn	Msg/nnn
9992nnn	Age/nnn
9998000	Foreign
9998nnn	Ldate/nnn
9999nnn	Cycle/nnn
9999999	Permanent

METHODFILE Record

As shown in Table 58, each record in the method file specified by ddname `LCMMTHIN` specifies a volser and the management method for that volume.

Table 58. Method File Record Format Description

Starting Column	Ending Column	Field Description
1	6	Volser (left-justified and padded with trailing blanks if necessary)
7	16	Management method for the volume (left-justified and padded with trailing blanks if necessary)
17	17	Specifies how the management method applies to the volume: • Blank or **D** - specifies that the method applies only if no other statement or option specifies a method for the volume. This method overrides methods specified by the `OPTIONS` statement `EXTERNAL` and `HSCONLY` parameters unless those parameters specify the `UNCOND` keyword. • **U** - specifies that the method always applies, and overrides any other statement or option that covers the same volume. The method overrides methods specified by the `OPTIONS` statement `EXTERNAL` and `HSCONLY` parameters even if those parameters specify the `UNCOND` keyword.
		Hint: Note: All other columns must contain blank characters.

Appendix E. NCS/VTCS Alphabetic Volsers

NCS/VTCS supports alphabetic volser ranges for all commands and utilities. The rules for alphabetic volser ranges are as follows:

1. An alphabetic volser range consists of a pair of volsers (start volser and end volser) containing an incrementing alphabetic portion of 1 to 6 characters. For example:, 00000<u>A</u>-00000<u>Z</u>, ABC<u>AAA</u>-ABC<u>ZZZ</u>, 9<u>AA</u>000-9<u>CC</u>000, A00<u>A</u>00-A00<u>M</u>00.

   a. A volser is composed of sequence of one to six numerics, (upper case) alphabetic or national characters (#, @ and the primary national currency symbol).

   b. A volser of less than six characters is left justified and blank padded. Each volser element in a range must have the same number of characters specified. For example, if the first volser element is 4 characters, the second must be exactly 4 characters.

2. The start and end volsers forming a volser range consists of the following sub-elements: an optional prefix, an incremental portion, and an optional suffix. Table 62. on page 384 shows examples of alphabetic volser ranges.

   a. The optional prefix consists of identical leading characters (if any) in the start and end volsers.

   b. The incremental portion starts at the first non-identical leading character in the start and end volsers forming a range. The incremental portion is either:

      • All numeric (contains characters 0 through 9 only).

      • All alphabetic (contains character A through Z only).

   The incremental portion of a volser range, therefore, terminates where a change of character type (numeric -> alphabetic or alphabetic -> numeric) is detected.

The incremental type is derived from the character type of the first character in the incremental part (numeric/alphabetic). Table 59 on page 382 shows example incremental ranges.

Table 59. Example Incremental Ranges

volser Range	Incremental Portion	Data Type
00000A-00000Z	A-Z	Character
ABCAAA-ABCZZZ	AAA-ZZZ	Character
9AAZ00-9CCZ00	AAZ-CCZ	Character
A00B00-A99B00	00-99	Numeric
A00A00-A00M00	A-M	Character
A00B00-A00B99	00-99	Numeric

Note the following rules for incremental ranges:

- The expansion of an alphabetic incremental part is derived from a collating sequence of A-Z (it will not include the national character set).

- The data types of the incremental portions in the start and end volsers must be identical.

- The position of the incremental portion of the start volser must match that of the end volser.

- The length of the incremental portion of the start and end volsers must be identical.

- The incremental portion of the end volser must be greater than or equal to the start volser.

c. The optional suffix consists of the trailing characters from the end of the incremental portion onwards. Table 60 on page 382 shows an example range

Table 60. Example Range Suffix

Volser Range	Incremental Portion	Suffix
A00B00-A00B99	00-99	none
A00B@0-A00D@0	B-D	@0
9AAZ00-9CCZ00	AAZ-CCZ	00 (not Z00)
900A@A-950A@A	900-950	A@A
ABCAAA-ABCZZZ	AAA-ZZZ	none

suffix. For a range to be valid the suffix of the start and end volsers forming the range must be identical.

3. The number of volumes generated from an alphabetic volser range is dependent on the number of elements in the incremental portion of the volser elements. For an A to Z range in each character position, the number of volumes can be calculated by 26

to the power of the number of positions that are being incremented as shown in Table 61 on page 383.

Table 61. Size of Alphabetic Volser Ranges

Range	Calculation	Number of Volumes
A-Z	26^1	26
AA-ZZ	26^2	676
AAA-ZZZ	26^3	17,576
AAAA-ZZZZ	26^4	456,976

STOP **Warning:** Per Table 61 on page 383, it is possible to define 26^4 VTVs in a single range. **Note, however, that** the more VTVs you define, the bigger your CDS has to be.

Alphabetic Volser Examples

Table 62 on page 384 and Table 63. on page 385 describe valid and invalid alphabetic ranges.

Table 62. Valid Alphabetic Ranges

Range	Subcomponents			Number of VTVs
	Prefix	**Incremental Portion**	**Suffix**	
AAA000-AAZ000		AAA-AAZ	000	26
A00A00-A00A99	A00A	00-99		100
0AAAA0-0ZZZZ0	0	AAAA-ZZZZ	0	456,976
A00A00-A99A00	A	00-99	A00	100
99AA##-99ZZ##	99	AA-ZZ	##	676
A9A000-A9Z000	A9	A-Z	000	26
######-######	######			1
AA00##-ZZ00##		AA-ZZ	00##	676
AA00##-AA99##	AA	00-99	##	100
PROD00-PROD99	PROD	00-99		100
PROD00-PROZ00	PRO	D-Z	00	23
A4Z#@0-A9Z#@0	A	4-9	Z#@0	6
A4Z#@0-Z4Z#@0		A-Z	4Z#@0	26
A4Z#@0-A4Z#@6	A4Z#@	0-6		7
AAAAAA-AAACCC		AAAAAA-AAACCC		1407
A3BZZ9-A3CDE9	A3	BZZ-CDE	9	84
999AM8-999CM8	999	AM-CM	8	53
111AAA-111ZZZ	111	AAA-ZZZ		17576

Table 63. Invalid Alphabetic Ranges

Range	Subcomponents			Number of VTVs	Comments
	Prefix	Incremental Portion	Suffix		
0AAAAA-0BAAAA	0	AAAAA-BAAAA		456,977	Greater than 456,976 VTVs
A9A000-A9Z999					Cannot mix incremental portions
######-#####@					National characters cannot increment
AA00##-ZZ99##					Invalid range
CCNNZZ-CDNZAA		CCNNZZ-CDNZAA		464,414	Greater than 456,976 VTVs
A4Z#@0-A9Z#@9					Invalid range

Appendix F. Elements Tags for Dynamically Added Fields

Below is a table that contains the element tags that can be used when defining dynamic volume fields within the TMS Interface Definition Response Document.

Table 64. Element Tags for Dynamic Volume Fields

Data Tag	Occurs In	Used By	Definition	Multiple	Content
<fielddefinitions>	<tmsinterfacedefinitionresponse>		Contains <field> elements	No	Element
<field name="">	<fielddefinitions>	E,B	Name of the field being defined. Field name can be a maximum of 25 characters in length. This does not include the TMS name and delimiter applied during creation	Yes	Element
<headings>	<field>		Contains <h> elements.	No	Element
<h>	<headings>	E,B	Contains default header lines of the field.	Yes	Mixed
<datatype>	<field>	E,B	Type of data that is used in this field. Acceptable values are: **INT, CHAR, BOOL**, DATE, TIME	No	Mixed
<defaultsummarytype>	<field>	E,B	Acceptable values are: **NONE** (for char, date, time), **SUM** or **AVG** (for int), **TRUE** (for bool)	No	Mixed
<defaultoutputsize>	<field>	E,B	Length of the output field	No	Mixed
<xmlinputsize>	<field>	B	Input size for field in TMS Tape Information volume record. This is only allowed for **CHAR** datatypes	No	Mixed

Table 64. Element Tags for Dynamic Volume Fields

<collate>	<field>	B	Collating sequence for character fields. Acceptable values are: **NORMAL**, **ALTERNATE**	No	Mixed
<aliases>	<field>		Contains <alias> elements.	No	
<alias>	<aliases>	B	Other valid names for a field. Ex: serial has aliases of ser, volser, volume, vol	Yes	Mixed
<description>	<field>	E	Description of the field	No	Mixed
<possiblevalues>	<field>	E	Contains <pv> and <pd> elements.	No	Element
<pv>	<possiblevalues>	E	Possible value for a field. Acceptable values depend on the field. Example, field Classification has possible values of SCRATCH, NONSCRATCH, BADSCRATCH, EXPIRED, CLEAN,	Yes	Mixed
<pd>	<possiblevalues>	E	Description of a possible value. A description element <pd>is always paired to a value <pv> element.	Yes	Mixed

Field Descriptions

Data Tag

Lists the exact name of the XML element, plus any attributes that can be included within the tag.

Occurs In

The parent data tag that the specified data tag resides under.

Used By

E=Explorer, B=Batch job

Definition

A brief description of the contents of the data tag.

Multiple

Specifies whether there can be more than one data tag of the same name specified.

Content

Specifies if the data tag contains Parsed Character Data (Mixed) or other data tags(Element).

Glossary

A

ACS. Automated Cartridge System.

ACSs folder (ExLM Explorer). A folder that contains the ACS objects that describe the ACSs and their LSM groups that ExLM will manage.

ACS object (ExLM Explorer). An object that represents an ACS that will be managed by your ExLM. An ACS can be managed as a whole or its LSMs can be managed by groups.

ACTION statement. An ExLM statement that lets you do *ad hoc* activities including Nearline volume moves and ejects and VTV consolidations.

as needed. A term that refers to the condition where volumes are ejected or moved from a managed LSM when it becomes necessary to do so in order to meet free cell or scratch criteria.

Automated Cartridge System (ACS). A hardware subsystem consisting of a Library Management Unit (LMU) and from 1 to 16 LSMs attached to that LMU.

B

balancing. The ExLM process of spreading free cells or scratch volumes among LSMs within an LSM SubGroup.

base name. The portion of a generation data set true or full name that constitutes the generation data group (GDG) base entry. A base name does not include a generation or version number.

blank location code. A location code that denotes the main library location for the CA-1 tape management system.

blank vault name. The null or blank out-of-area code assigned by the CA-1 Vault Management System to volumes stored at the CA-1 main tape library location. This is also referred to as the null vault name.

C

CA-TLMS. Computer Associates Tape Management System. Third-party software by Computer Associates International, Inc.

CA-1. Computer Associates Tape Management System. Third-party software by Computer Associates International, Inc.

CAP. Cartridge Access Port.

cartridge. A computer tape enclosed in a plastic housing.

Cartridge Access Port (CAP). An assembly located on the door of an LSM that allows multiple cartridges to be loaded or unloaded by an operator.

CDS. Control Data Set.

configuration file. A data set that contains ExLM configuration objects and describes how ExLM should manage ACS content. The data set is created through the use of the ExLM Explorer.

consolidation. Using ExLM to group VTVs on consolidation MVCs.

client. A functional unit that receives shared services from a server.

cell. A storage slot in an LSM that is used to store a tape cartridge.

CHECK option. An ExLM execution option that provides a nondisruptive way in which to test or experiment with ExLM.

content management. The process of managing the content of cartridge storage cells in one or more LSMs.

control data set (CDS). The data set used by the HSC to control the functions of an ACS.

controlling data set name. The data set name from the tape management system that is used by ExLM when managing LSM content using data set name. Generally this is the first data set on a volume.

copy number. It is possible that multiple copies of the same controlling data set name may exist on different tape volumes. ExLM uses the term copy number to designate the ordinal number of an instance of a given data set in a tape management system. Copy number 1 refers to the most recently created copy, copy number 2 refers to the next most recently created copy, and so on. Copy number is used by the METHOD statement in an ExLM parameter file.

Cyclesoon volume. A volume with a controlling data set that is due to expire within a specified number of days.

D

data set identifier. A character string that may contain wild cards and represents the names of one or more nongeneration or generation data sets.

DATASET statement. An ExLM control statement that provides the capability to specify how ExLM should manage the volumes associated with one or more tape data sets.

default LOCATION statement. An ExLM LOCATION statement coded to specify how ExLM should manage volumes associated with locations that are not defined by specific LOCATION statements.

defective media removal. The ExLM process of ejecting nonscratch volumes that have been marked as being defective in the tape management system.

demotion. The process of moving a volume down the hierarchy of LSM groups.

DFSMSrmm. Data Facility System Managed Storage removable media manager.

DISPLAY command. A command issued by a console operator to display overall ExLM status, CAP use, and movement information.

distribution. The ExLM process of spreading free cells or scratch volumes across multiple LSM SubGroups within an LSM Group.

E

Eject method. A predefined ExLM management method that will cause volumes to be ejected from managed LSMs.

ExLM Agent. A started task that is used to obtain TMS information from a remote host.

ExLM configuration object (ExLM Explorer). An object that represents an ExLM configuration file and contains all the other ExLM objects.

ExLM Explorer. A graphical user interface that is used to create a configuration file on the MVS host used to execute ExLM runs.

expired volume. A volume whose controlling data set has expired. Expired volumes are also Cyclesoon volumes.

export. Consolidates VTVs (if required) and creates a manifest file that lists the VTVs and MVCs available for export from a VSM system.

externally managed volume. A volume that is defined to the tape management system, but whose use is controlled by some other software system.

ExtendedStore™ LSM. One or more LSMs with no cartridge drives (CDs) that are attached by pass–thru ports to other LSMs (with CDs) in an ACS. These LSMs provide archive storage for cartridges containing less active data sets. Cartridges can be

entered and ejected directly into and out of this LSM though either a standard CAP or an enhanced CAP.

F

free cell. A vacant cell to which no volume is assigned by the HSC.

frozen panel. The HSC `SET FREEZE` utility marks panels "frozen" to prohibit volume movement to or from these panels. You can, however, use the The `CLEARFROZENPANELS` parameter of the `OPTIONS` statement to specify that ExLM removes volumes from frozen panels in managed LSMs.

G

GENERAL. The name of a tape subpool defined automatically by ExLM. Any volume in an LSM that does not belong to a user-defined tape subpool automatically belongs to subpool GENERAL.

generation number. The ordinal number of a generation of a generation data set. ExLM refers to the highest (most current) absolute generation number of a generation data set as generation number 1. Generation number is used by the METHOD statement in an ExLM parameter file.

H

Host Software Component (HSC). That portion of an Automated Cartridge System (ACS) that executes on host systems attached to the ACS. The HSC provides the interface between the operating system and the rest of the ACS.

HSC. Host Software Component.

HSC scratch status. A status value, scratch or nonscratch, recorded by the HSC for a tape volume.

HSC scratch status synchronization. The ExLM process of setting out-of-sync HSC scratch status indicators of volumes to match their eligibility to be mounted in response to scratch mount requests.

HSC Unscratch. The ExLM process of setting HSC scratch status indicators for some scratch volumes to 'nonscratch'. This would typically be done to

maintain a reserve capacity of scratch volumes in an ExtendedStore™ LSM.

HSC-only volume. A volume defined to the HSC but not defined to a tape management system.

J

JCL. Job Control Language.

L

LIBGEN. The process of defining an ACS configuration to the host software.

library content management. The process of managing the content of cartridge storage cells in one or more LSMs.

Library Storage Module (LSM). Provides a tape cartridge storage cell array plus the robot necessary to move the cartridges.

Local. The ExLM default location name for the tape management system main library location.

location. A tape volume storage area that is defined to the tape management system.

location code. An identifier assigned to a tape volume by the tape management system that identifies the intended storage location for that volume.

Locations folder (ExLM Explorer). A folder that contains the location objects that correspond to your tape cartridge storage locations.

location ID. A two-character identifier assigned to a tape volume by the CA-TLMS Tape retention System. It identifies the location where the volume is scheduled for storage.

location name. The name of a tape storage location. ExLM provides the capability to define location names; unlike location codes, location names are not defined to the tape management system.

Location object (ExLM Explorer). An object that represents a tape cartridge storage location based on codes from your tape management system.

LOCATION statement. An ExLM control statement used to specify how ExLM should manage the volumes associated with a location.

LSM. Library Storage Module.

LSM Group. A collection of one or more LSMs to be managed together as a unit. LSM Groups are defined by the ExLM MANAGE control statement.

LSM Group hierarchy. LSM Groups that are defined to have a hierarchical relationship to one another.

LSM id. A three-digit hexadecimal number that uniquely identifies an LSM to a host system.

LSM SubGroup. A collection of one or more LSMs within an LSM Group. LSM Groups may be subdivided into LSM SubGroups for the purpose of specifying separate scratch or free cell quantities for different portions of the LSM Group.

M

main tape library location. The tape management system main library location.

MANAGE statement. An ExLM control statement used to define an LSM Group and describe how its content should be managed.

managed LSM. An LSM that is defined to ExLM by a MANAGE statement.

management method. Named set of conditions and attributes that are assigned to volumes that controls how ExLM will process them.

message log. A data set to which ExLM writes informational, warning, and error messages.

METHOD statement. An ExLM control statement used to define an ExLM management method.

Method object (ExLM Explorer). A named collection of conditions and attributes that define how ExLM should manage a given collection of volumes.

Methods folder (ExLM Explorer). A folder that contains the management methods that determine how ExLM manages volumes and has properties that

determine how those methods are assigned to nonscratch volumes.

Minenter volume. A nonscratch volume that has been entered into an LSM within a specified number of days.

Minref volume. A nonscratch volume that has been referenced within a specified number of days.

Multiple volume cartridge (MVC). A physical cartridge in the LSM that contains one or more virtual tape volumes or no virtual tape volumes, but has been identified as a volume that can be selected for virtual tape volume stacking. The information about the multiple volume cartridge is stored in the HSC control data set.

N

NeverEject method. A predefined ExLM management method. ExLM will not eject a NEVEREJECT volume from an LSM under any circumstance.

non-LSM scratch volume. A scratch volume that is defined to the tape management system but is not stored in an LSM.

nonmanaged LSM. An LSM that is defined to the HSC but is not defined to ExLM by a MANAGE statement. ExLM ignores nonmanaged LSMs.

nonscratch volume. A volume not classified as a scratch volume, bad scratch volume, expired volume, or cleaning cartridge.

null vault name. The null or blank out-of-area code assigned by the CA-1 Vault Management System to volumes stored at the CA-1 main tape library location. This is also referred to as the blank vault name.

O

OPTIONS statement. An ExLM control statement used to define values for ExLM execution parameters and to specify how ExLM should manage HSC-only volumes and externally managed volumes.

out-of-area code. A four-character identifier assigned to a tape volume by the CA-1 Vault

Management System. It identifies the vault at which the volume is scheduled for storage.

out-of-area volume. A tape volume scheduled for storage by the CA-1 Vault Management System at a location other than the CA-1 main library location.

out-of-sync. If the HSC scratch status indicator for a tape volume does not properly reflect its eligibility to be mounted as a scratch volume, it is said to be out-of-sync with the tape management system.

P

parameter file. A data set that contains ExLM control statements and describes how ExLM should manage ACS content.

pass-thru. A robotic cartridge movement operation from one LSM to another through a Pass-thru Port.

Pass-thru Port. A mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

PAUSE command. A command issued by a console operator to temporarily pause cartridge ejections and/or movement by ExLM.

PickFirst method. A predefined ExLM management method. PickFirst volumes in managed LSMs will be picked for ejection or demotion first when room is needed in order to meet free cell or scratch criteria.

PickLast method. A predefined ExLM management method. PickLast volumes in managed LSMs will be picked for ejection or demotion last when room is needed in order to meet free cell or scratch criteria.

pick order. The order in which a volume may be picked for ejection or demotion. This is determined by the ORDER attribute of its assigned management method.

promotion. The process of moving a scratch volume up the hierarchy of LSM groups.

property sheets (ExLM Explorer). A screen within ExLM Explorer that allows you to view and update configuration information.

Pull List object (ExLM Explorer). An object that refers to a list of volumes that will be entered into the

library after an ExLM run. Typically such a list would come from a job scheduling package.

Pull Lists folder (ExLM Explorer). A folder that contains the Pull List that list volumes to be entered into the library after an ExLM run.

Pull List Volume. A volume that had an entry in the pull list file identified by a PULLLIST statement.

R

Real tape drive (RTD). The physical transport (Timberline or Redwood) controlled by the Virtual Storage Manager (VSM). The transport has a data path to a Virtual Tape Storage Subsystem and may optionally have a data path to MVS or to another Virtual Tape Storage Subsystem.

Reports folder (ExLM Explorer). A folder that contains the reports that your ExLM runs can produce.

Report object (ExLM Explorer). An object that represents a report that is defined to the ExLM configuration. ExLM has a number of predefined standard reports and you can create your own custom reports.

REPORT statement. An ExLM control statement that provides the capability to control ExLM report creation.

RESUME command. A command issued by a console operator to begin, or to resume paused ExLM cartridge movement and/or ejection.

Run object (ExLM Explorer). An object that describes a particular type of ExLM batch processing run that you wish to make. These runs can produce reports and manage your libraries according to your specifications.

S

SCAN option. An ExLM execution option that provides the capability to validate the syntax of ExLM control statements in a parameter file.

scratch status. A status value associated with a tape volume that indicates whether the volume is suitable for output operations. ExLM uses the tape

management system volume scratch status if available. Otherwise, it uses the HSC volume scratch status.

scratch volume. A volume that is available for receiving a new tape data set.

slot number. A number assigned to a tape volume by the TMS that can simplify manual cartridge filing and retrieval tasks. The volume slot number, that is printed in both ExLM and tape management system reports, may be used to pinpoint the storage place for the volume.

SLUADMIN. HSC software that performs Automated Cartridge System utility functions.

SMF. System Management Facility. An MVS component that records various system activity.

Standard method. A predefined ExLM management method that allows volumes to be ejected from managed LSMs as needed in order to meet free cell or scratch criteria. Volumes assigned this method will be picked after PickFirst volumes and before PickLast volumes. Standard is the management method that will be assigned to nonscratch volumes that have not been assigned a method by any parameter file statements.

Subpools folder (ExLM Explorer). A folder that contains the tape subpools you define for ExLM to manage.

Subpool object (ExLM Explorer). An object that contains a collection of tape volumes you specify by serial number for ExLM to manage.

SUBPOOL statement. An ExLM control statement used to define a named set of tape volume serial numbers called a tape subpool.

T

tape group. A set of tape volumes that is a unique combination of subpool and media type.

tape library. Traditionally, all computer tapes associated with a data center. ExLM regards the set of all tape volumes stored in managed LSMs or under tape management system control as the tape library.

Tape Management Catalog (TMC). A data set used by the CA-1 Tape Management System to record an inventory of the tape library.

tape management system volume scratch status. A status value, scratch or nonscratch, recorded by the tape management system for a tape volume define to that system.

Tape Retention System (TRS). The CA-TLMS tape management system software that provides the capability to define vaults and a vaulting schedule.

tape subpool. A named set of tape volume serial numbers defined by an ExLM SUBPOOL control statement.

TMC. Tape Management Catalog.

TMSs folder (ExLM Explorer). A folder that contains the TMS objects that identify a tape management system.

TMS object (ExLM Explorer). An object that identifies a tape management system that ExLM uses to obtain information about volumes.

TMS statement. An ExLM control statement used to identify a tape management system and to select processing options specific to it.

transport. An electromechanical device capable of threading tape from a cartridge, moving the tape across the read/write head, and writing data onto or reading data from the tape.

TRS. Tape Retention System.

true name. The full name of an OS data set. The low level qualifier of a generation data set true name identifies a generation and version number.

V

Vault Management System (VMS). The CA-1 tape management system software that provides the capability to define vaults and a vaulting schedule.

vault name. An identifier assigned to a tape volume by the CA-1 Vault Management System that identifies the intended storage site location for the volume. Also called an out-of-area code.

vault rotation. A process in which tape volumes are physically moved from one location to another in accordance with a vaulting schedule.

vaulting schedule. A specification for the CA-1 Vault Management System that details the scheduled movement of tape volumes between vaults and the CA-1 main tape library location.

Virtual Tape Control System (VTCS). The primary host software that controls activity and information about Virtual Tape Storage Subsystems, virtual tape volumes, real tape drives, and multiple volume cartridges. This software operates in a separate address space from HSC, but communicates closely with HSC.

Virtual tape drive (VTD). A transport in the Virtual Tape Storage Subsystem that emulates a physical 3490E to MVS. The data written to a virtual tape drive is really being written to DASD.

Virtual Tape Storage Subsystem (VTSS). The DASD buffer containing virtual tape volumes and transports. The Virtual Tape Storage Subsystem is a StorageTek RAID 6+ hardware device that emulates 32 or 64 transports. The RAID hardware can read and write "tape'" data from or to DASD, and can read and write data from or to a real tape drive.

Virtual tape volume (VTV). The emulated "cartridge'" whose volume serial number is known to the MVS catalog and the tape management system as a tape data set.

VMF. Volume Master File.

VMS. Vault Management System.

volser number. A character string coded as a single tape volume serial number for a SUBPOOL control statement.

volser range. Two volser numbers, separated by a dash, that are coded for a SUBPOOL statement to define a set of consecutive tape volume serial numbers.

volume. A data carrier that is mounted or demounted as a unit.

Volume Master File (VMF). A data set used by the CA-TLMS tape management system to record an inventory of the tape library.

volume movement schedule. A specification for the CA-TLMS Tape Retention System that details the scheduled movement of tape volumes between offsite locations the CA-TLMS data center location.

volume serial number. A six-character alphanumeric label used to identify a tape volume.

W

wild card. A one- or two-character pattern that may be coded as part of a data set identifier. Wildcards are used to specify a single data set identifier that represents many different data set identifiers.

wizard. A dialog of ExLM Explorer that can be invoked to guide you through the process of creating a new configuration or object.

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