StorageTek Host Software Component (VM Implementation)

Operator's Guide

Version 6.2

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Revision 02

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Host Software Component (HSC) Operator's Guide

E21435-02

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Document Effectivity

EC Number	Date	Doc Kit Number	Type	Effectivity
132993	September, 2007		Revision A	This document applies to the Host Software Component for VM (VM/HSC), Version 6.2.
---	August, 2008	---	Revision B	
---	April, 2011	---	Revision 01	
---	April, 2012	---	Revision 02	

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What’s New With This Release?

HSC 6.2 includes the following enhancements and modifications:

Enhancement/Modification	Publication(s)/ Primary Locations
Revision 02:	
The SL8500 partitioning feature has been enhanced for users at firmware level 7.02 and above. Legacy partitioning procedures for users below this firmware level continue to appear in Appendix A, “HSC Support for the SL8500 Library.” Enhanced partitioning procedures for both the SL8500 and SL3000 libraries are shown in a new appendix, Appendix C, “StreamLine Library Partitioning.”	***System Programmer’s Guide*** Appendix C, StreamLine Library Partitioning
The Display DRives command includes the SHOWSlot parameter, used to display the drive bay location (slot) for drives in SL3000 and SL8500 libraries.	***Operator’s Guide*** Chapter 2, Display DRives command ***Messages and Codes Guide*** Changed messages: • SLS0041I • SLS2916I • SLS4633I
The Display EXceptns command reports errors in two formats: • LSM *AA:LL* • *AA:LL:CC*	***Operator’s Guide*** Chapter 2, Display EXceptns command
The HSC Start procedure EXEC statement allows you to write HSC software events to the system LOGREC data set.	***Installation Guide*** Chapter 8, HSC Initialization ***System Programmer’s Guide*** Chapter 3, HSC Control Statements and HSC Start Procedure

Enhancement/Modification	Publication(s)/ Primary Locations
Revision 01:	
Support for the T10000B and T10000C drives and cartridges.	***System Programmer's Guide*** Chapter 2, T10000 Drive Encryption Chapter 3, VOLATTR control statement Chapter 4, EJECt Cartridge and Scratch Redistribution utilities ***Interface to Tape Managment Systems Guide*** Chapter 3, MOUNT, QDRLIST, QSCRATCH, and SELSCR requests ***Operator's Guide*** Chapter 2, Display DRives, Display SCRatch, Display THReshld, EJect, Mount, Warn commands
Support for the SL3000 library Access Expansion Module (AEM).	***System Programmer's Guide*** Chapter 4, AUDIt, EJECt Cartridge, ENTEr Cartridges, and MOVe utilities Appendix C, Adding/Removing Expansion Modules - SL3000 Library, Appendix D, CAPid Formats ***Operator's Guide*** Chapter 1, SL3000 Library description Chapter 2, CAPid Formats, CAPPref, DRain, EJect, ENter, MODify, MOVe, RELease CAP, SENter
The SL8500 library now allows you to remove or add a partition.	***System Programmer's Guide*** Appendix A, HSC Support for the SL8500 Library: • Remove a Partition from the Library • Add a Partition to the Library.

Enhancement/Modification	Publication(s)/ Primary Locations
For SL8500 libraries, the Redundant Electronics (RE) feature minimizes control path downtime caused by an active Library Controller (LC) failure. The RE configuration provides a standby LC that acts as a back up to the active LC.	***System Programmer's Guide*** Chapter 3, HSC Control Statements and HSC Start Procedure • LMUPATH control statement Appendix A, HSC Support for the SL8500 Library: • TCP/IP Communications - Important Considerations • Multiple TCP/IP Redundant Electronics (RE) ***Operator's Guide*** Chapter 1, General Information • SL8500 Redundant Electronics (RE) Chapter 2, Commands, Control Statements, and Utilities • Display Acs • SWitch Chapter 3, Operating an Automated Cartridge System • SL8500 Redundant Electronics Environment • Redundant LC Operational Overview and Operation ***Messages and Codes Guide*** New messages: • SLS0692I • SLS0693I • SLS1666E • SLS1667I Changed messages: • SLS0699I • SLS1000I • SLS1003I • SLS1004I • SLS1007I

Enhancement/Modification	Publication(s)/ Primary Locations
For the SL3000 library, "Adding Resources to a Library" procedure, there is an additional optional step to modify CAPs online (step 7) after varying all ACSs online. For the SL3000 library, "Removing Resources from a Library" procedure, there is an additional optional step to modify CAPs offline (step 6) after varying RTDs offline to VTCS.	***System Programmer's Guide*** Appendix B, HSC Support for the SL3000 Library • Adding Resources to a Library • Removing Resources from a Library
The Media Warranty Life feature shows the percentage of media life that has been used for a volume. The following transports are supported: • T9*x*40, excluding T9840B • T10000A • T10000B	***System Programmer's Guide*** Chapter 4, Utility Functions • Volume Report Utility: MWL, MWLNA, and MWLGE parameters Chapter 6, Monitor Cartridges Nearing End of Life ***Messages and Codes Guide*** New message: • SLS2149I Changed message: • SLS0601I
The PING parameter on the LMUPATH control statement allows you to set the number of minutes in between requests sent from the HSC to the LMU. These requests are to keep the connection active, which prevents a firewall from closing the connection due to inactivity	***System Programmer's Guide*** Chapter 3, HSC Control Statements and HSC Start Procedure • LMUPATH control statement
The Display DRives command adds the IDEntity parameter, which displays the World Wide Name transport identifier and the transport serial number. This update affects HSC 6.1 and later.	***Operator's Guide*** Chapter 2, Display DRives

Enhancement/Modification	Publication(s)/ Primary Locations
Revision B:	
Support for the SL3000 library (HSC 6.1 and later).	***Installation Guide*** Chapter 2, Calculating DASD Space Chapter 6, SLILSM, SLIDRIVS macros Chapter 7, Storage Cell Capacity for StreamLine SL3000 Libraries Appendix B, Library Configurations ***Operator's Guide*** Chapter 2, CAPPref, DRAin, EJect, ENter, MODify, MOVe, RELease CAP, VIew commands ***System Programmer's Guide*** Chapter 2, Mixing Media Types and Recording Techniques Chapter 4, AUDIt , EJECt Cartridge, Initialize Cartridge utilities Appendix B, HSC Support for the SL3000 Library
Multiple connections to an SL8500 library (HSC 6.1 and later).	***System Programmer's Guide*** Appendix A, HSC Support for the SL8500 Library

Enhancement/Modification	Publication(s)/ Primary Locations
Support for T9840D drives (HSC 6.1 and later).	***Installation Guide*** Chapter 2, Unit Addresses Chapter 6, SLIDRIVS macro Chapter 12, External Media Requirements ***Operator's Guide*** Chapter 2, Display Drives, Display SCRatch, Display Mount, THReshld, EJect, Warn ***System Programmer's Guide*** Chapter 3, TAPEREQ, UNITATTR, VOLATTR Chapter 4, EJECt, SCRatch Redistribution ***Interface to Tape Management Systems Manual*** Chapter 3, MOUNT, QDRLIST, QSCRATCH, SELSCR requests
The SLILIBRY macro adds the FUTRACS parameter to allow new ACSs to be added to the library complex (HSC 6.1 and later).	***Installation Guide*** Chapter 6, SLILIBRY macro
The SLILSM macro adds the TYPE=3000 and DOOR=3000 parameters for the SL3000 library (HSC 6.1 and later).	***Installation Guide*** Chapter 6, SLILSM macro
The OPTion command DUPOFL parameter allows the duplicate VOLSER process to continue when the VOLSER being entered exists in an ACS that is disconnected or in an LSM that is offline (HSC 6.1 and later).	***Operator's Guide*** Chapter 4, OPTion command
The LMUPATH control statement PARTID parameter defines a partition ID for an SL3000 or SL8500 library (HSC 6.1 and later).	***System Programmer's Guide*** Chapter 3, LMUPATH control statement
The EJECt Cartridge utility SEQ parameter specifies whether or not CAP eject processing fills the CAP cells in the same order specified by the **VOLser** parameter (HSC 6.1 and later).	***System Programmer's Guide*** Chapter 4, EJECt Cartridge utility
The LIST diagnostic command has been expanded with more control blocks and enhanced storage dump capability (HSC 6.1 and later).	***System Programmer's Guide*** Chapter 5, LIST command

Enhancement/Modification	Publication(s)/ Primary Locations
Revision A:	
Guidelines to connect an SL8500 to the HSC.	***System Programmer's Guide*** Appendix A, Connecting the SL8500 to the HSC
SL8500 support for LSM partitioning.	***System Programmer's Guide*** Chapter 3, LMUPATH control statement Chapter 4, SET FREEZE utility Appendix A, Partitioning LSMs (main discussion) ***Operator's Guide*** Chapter 2, Display Acs, Display Cap, Display Exceptions, Display Lsm ***Messages and Codes*** Chapter 2, HSC System Messages *New:* SLS0073I, SLS0695I, SLS4232I, SLS4412I, SLS4413I, SLS4463I *Updated:* SLS0653I, SLS0663I, SLS1000I, SLS2008I, SLS4401I, SLS4407I, SLS4610I
Considerations for connecting an SL8500 to multiple hosts or to shared networks.	***System Programmer's Guide*** Appendix A, TCP/IP Communications - Important Considerations
Procedures to define dual IP connections for the SL8500.	***System Programmer's Guide*** Appendix A, Dual IP Connection
SLUADMIN output options, date field formats, and alphabetic data field formats have been expanded to include structured XML and comma-separated values (CSV).	***System Programmer's Guide*** Chapter 4, "SLUADMIN Output" and "Parameters Controlling Report Headings"
Support for the Unified User Interface (UUI) and CSV.	***System Programmer's Guide*** Chapter 4, "XML Tags - Commands and Utilities

Enhancement/Modification	Publication(s)/ Primary Locations
Support for T10000 drive encryption recording techniques and model types.	***System Programmer's Guide*** Chapter 2, T10000 Drive Encryption Chapter 3, VOLATTR control statement Chapter 4, EJECt Cartridge and Scratch Redistribution utilities ***Interface to Tape Management Systems Guide*** Chapter 3, MOUNT, QDRLIST, QSCRATCH, and SELSCR requests ***Operator's Guide*** Chapter 2, Display DRives, Display SCRatch, Display THReshld, EJect, Warn commands
The BACKup utility DD parameter allows a backup to be run on a selected CDS.	***System Programmer's Guide*** Chapter 4, BACKup utility
The EJECt utility WAITCAP parameter specifies whether a list of ejecting volumes waits for available CAP if one is not available.	***System Programmer's Guide*** Chapter 4, EJECt utility
The Volume Report utility NOVOL parameter displays summary and/or subpool totals without producing volume detail.	***System Programmer's Guide*** Chapter 4, Volume Report utility
The Display SCRatch command ALL parameter specifies that all scratch subpool totals, including 0 scratch count values, will be displayed.	***Operator's Guide*** Chapter 2, Display command
The SCRAtch and UNSCRatch operator commands have been added to allow you to scratch or unscratch up to 100 volumes.	***Operator's Guide*** Chapter 2, SCRAtch and UNSCRatch commands
Support for circumventing the IBM length restriction of 255 characters for a macro parameter.	***Installation Guide*** Chapter 6, SLIACS macro, LSM2, LSM3, and LSM4 parameters ***System Programmer's Guide*** Chapter 4, Reconfiguration utility
The starting column for the control statement information area has been changed from column 2 to column 1.	Control Statement Syntax Conventions, found in the following documents: ***System Programmer's Guide*** Appendix C ***Operator's Guide*** Appendix A

Preface

This guide describes how to operate Oracle's StorageTek Host Software Component (HSC) Automated Cartridge System (ACS), how to maintain the system, and how to recognize and resolve problems.

The *Operator's Guide* is intended primarily for data center operators responsible for operating and maintaining the Automated Cartridge System. System programmers and computer system administrators may also find information contained in this guide useful.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/support/contact.html or visit http://www.oracle.com/accessibility/support.html if you are hearing impaired.

Chapter 1. General Information

Introduction

This chapter provides a general description of the Automated Cartridge System (ACS) components and features, introduces the terminology that is used throughout this guide, and presents a high-level explanation of how the ACS interacts with the operating system.

The following topics are discussed:

- system overview
- system components
- HSC-to-ACS operating modes
- LSM operating modes.

System Overview

The StorageTek Automated Cartridge System (called the library) is a fully automated storage and retrieval system for tape cartridges. The library must be attached to at least one CPU (host), and optionally allows attachment to a maximum of 16 host systems. All library configuration and volume information is contained in a control data set which is shared by all hosts.

Control Path

The library is controlled by a Host Software Component (HSC) that resides in the host but is transparent to the operating system. A separate HSC must reside on each attached host. The HSC influences allocation, intercepts mount/dismount messages from the operating system, and receives requests from the programmatic interface and translates them into commands which are carried by the control path to the LSM.

The control path consists of the following components:

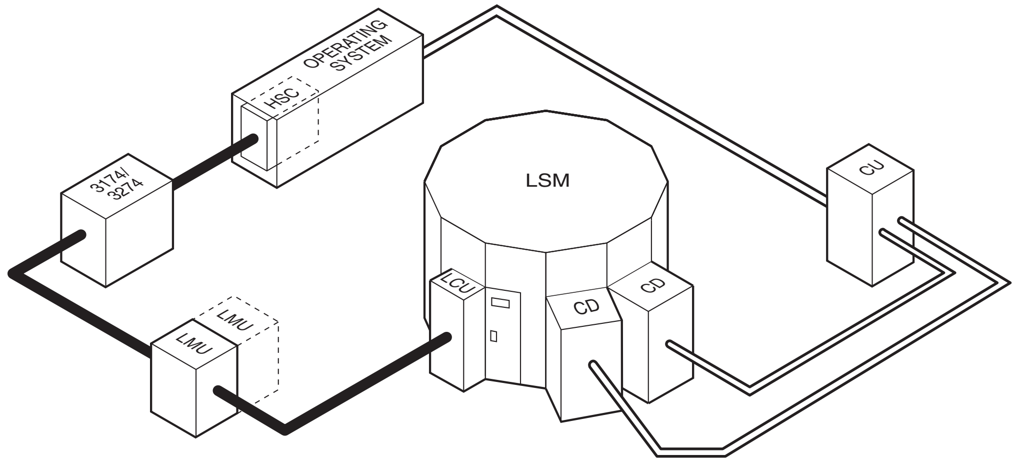
- Host Software Component
- 3174, 3274, or compatible controller
- Library Management Unit (LMU)
- Library Control Unit (LCU)
- Library Storage Module (LSM).

In response to a mount message, the robot in the LSM retrieves the required cartridge from a storage cell, CAP, or pass-thru port (PTP), and inserts it into an allocated tape transport. For a dismount, the robot extracts the cartridge from the transport and returns it to a storage cell, CAP, or PTP in the LSM.

Data Path

The cartridge drives attached to the LSM are part of the cartridge subsystem. The cartridge subsystem is connected directly to the host forming a data path completely separated from the control path. This separation means that the data path is still available if a failure occurs in the control path.

Figure 1 on page 3 illustrates the way an ACS with a single 4410 LSM is divided in terms of function. Other ACS configurations are treated in this same manner.



NOTES:

LSM = LIBRARY STORAGE MODULE
LCU = LIBRARY CONTROL UNIT
LMU = LIBRARY MANGEMENT UNIT
CD = CARTRIDGE DRIVE
CU = CONTROL UNIT
HSC = HOST SOFTWARE COMPONENT
3274 = TERMINAL CONTROL UNIT (CUSTOMER SUPPLIED)

LEGEND:

LIBRARY CONTROL PATH (AUTOMATED MOUNTS/DISMOUNTS)

DATA PATH (READ/WRITE)

C27400

Figure 1. Library Control and Data Paths

System Components

Host Software Component

The HSC is the overall manager of the library, the interface between the tape management system (TMS) and each ACS. It maintains, in a DASD control data set, records of the cartridges stored in each ACS. The HSC intercepts mount/dismount messages, translates them into move requests, and routes them to the LMU.

The HSC also processes TMS volume and drive queries to assist with allocation. One of the HSC utilities interacts with the user's specific tape management system to identify the scratch cartridges located in the library.

When a user requests, through the tape management system, a cartridge mount on a transport, the HSC first determines if the required cartridge is listed in the control data set. It then assists the TMS with allocation of a library transport by returning an ordered list of configured transports where the cartridge can be mounted.

Library Management Unit

The LMU is the interface between the HSC and the LCU. An LMU emulates a 3278 model 2 terminal and connects to a 3174, 3274, or compatible control unit. The LMU and attached LCUs are connected with redundant local area networks (LAN 0 and LAN 1).

A single LMU manages from 1 to 24 LSMs. It is capable of receiving mount and dismount requests from as many as sixteen hosts. When a mount request is received, the LMU commands the robot in the appropriate LSM to do the following:

1. Move to the location of the cartridge
2. Verify that the cartridge is correct by reading its external Tri-Optic™ label
3. Retrieve the cartridge from the cell location
4. Move it to the proper location
5. Place the cartridge into the specified destination (transport, pass-thru port [PTP] cell, or CAP cell).

The LSM returns an ending status for each volume move request, which the LMU sends to the host.

Dual LMU

A dual LMU option is available to minimize control path downtime by allowing an automatic LMU switch in case of an LMU failure. In this configuration a second LMU is cabled to the local area network, connecting it to the LSM(s). The HSC directs all work to one LMU, called the master LMU, while the second LMU, called the standby LMU, remains powered on as a backup. Designation of master and standby LMU is dynamic and changes according to environmental conditions.

In a dual LMU configuration:

- both LMUs should be connected to all hosts,
- both LMUs can be powered on at all times, and
- both LMUs must be connected to both LAN 0 and LAN 1.

In the event of a failure in the master LMU, an automatic switch occurs and the standby LMU becomes the master LMU. The HSC is informed and notifies the operator of the switch. Outstanding requests are re-driven and all future LMU requests are sent to the new master LMU. Once the failed LMU is repaired and powered on, it becomes the standby LMU.

An operator SWitch command is provided for those occasions when it becomes necessary, or desirable, to dynamically switch to a standby LMU. Except for executing this command, no manual operator intervention is required. The operator issues the SWitch command, and the standby LMU takes over as the master LMU after instructing the old master LMU to initiate IPL. If the old master LMU re-IPLs successfully, it comes up as the standby LMU.

Note: Warnings and precautions apply to operating in a dual LMU environment. See “Dual LMU Operational Overview” on page 326 to become familiar with the requirements.

Station addresses must be specified for both the master and standby LMUs when the HSC is installed.

SL8500 Redundant Electronics (RE)

A Redundant Electronics (RE) option is available to minimize control path downtime caused by a Library Controller (LC) failure by automating a Library Controller switch. In this configuration a second Library Controller is cabled to the local area network, connecting it to the LSM(s). HSC directs all work to one Library Controller, called the active LC, while the second LC, called the standby, remains powered on as a ready backup. Designation of active and standby LC is dynamic and their roles change according to environmental conditions.

In this guide, refer to:

- "Display Acs" on page 65
- "SWITCH Command" on page 216
- "SL8500 Redundant Electronics Environment" on page 309
- "SL8500 LC Operation" on page 329.

and in the *HSC System Programmer's Guide*, see:

- Chapter 3, HSC Control Statements and HSC Start Procedure, LMUPATH control statement
- Appendix A, HSC Support for the SL8500 Library, "TCP/IP Communications - Important Considerations" and "Multiple TCP/IP Redundant Electronics (RE)."

Dual Library Controller Configuration

For this implementation, a dual LC configuration is one pair of LCs installed and network connected to one library in a string. **This is the only valid configuration.** Figure 1 shows an example of this configuration.

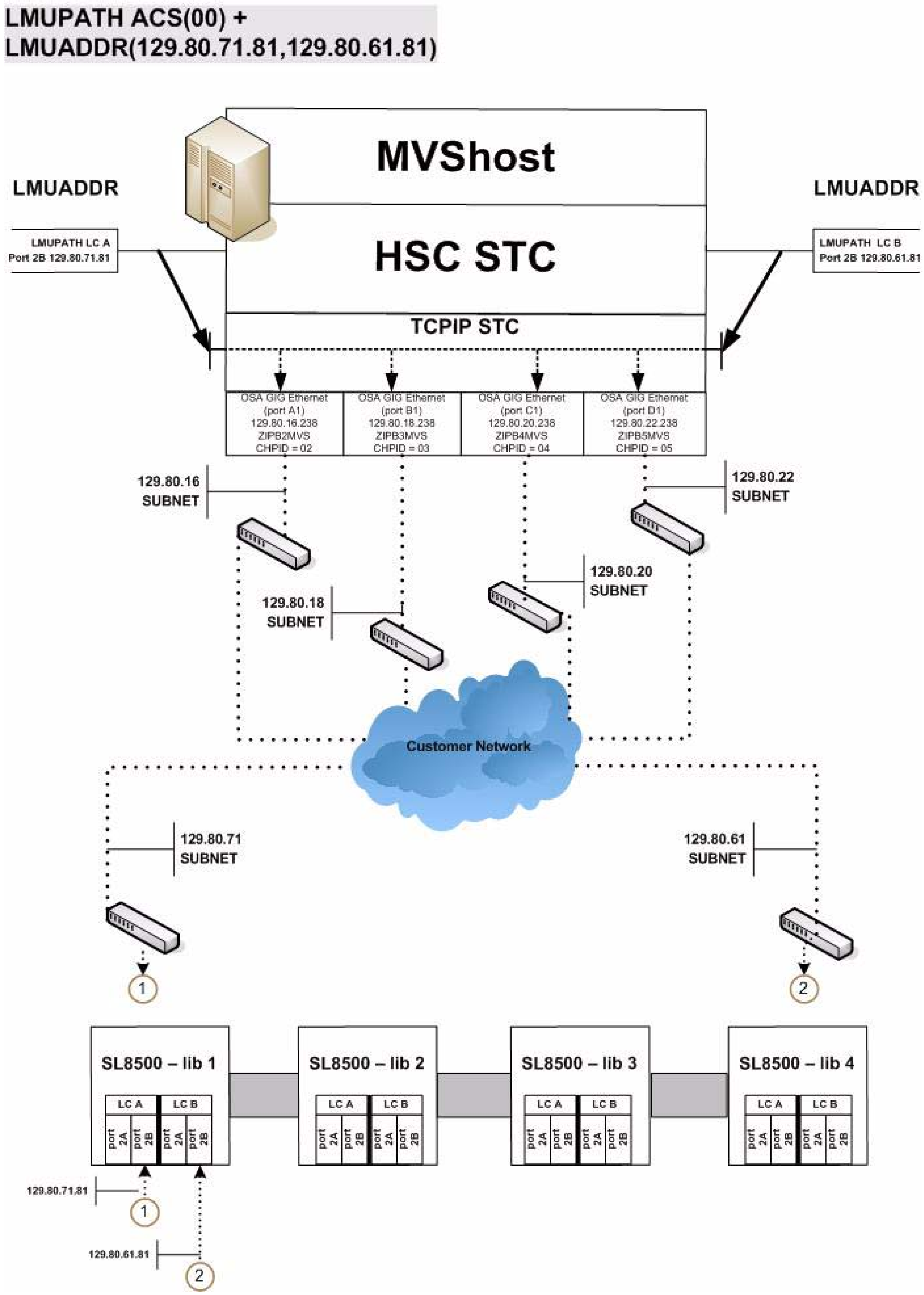


Figure 1. Dual LC Configuration

The following rules apply to a dual LC configuration. Both LCs

- should be connected to all hosts,
- can be powered on at all times, and
- must be connected to both LAN 0 and LAN 1.

In the event of a failure from the active LC, an automated switch will occur and the standby assumes the active LC role. The HSC is informed and notifies the operator of the switch. Most outstanding requests are re-driven and all future library requests are sent to the newly activated LC. Once the failed LC is repaired and powered on, it assumes the standby role.

The SWitch command (see “SWITCH Command” on page 216) is provided for those occasions when it becomes desirable to dynamically activate a standby LC. The operator issues the Switch command, and the standby LC assumes the active LC role after instructing the former active LC to initiate a reboot. If the former active LC reboots successfully, it assumes the standby LC role.

Note: Warnings and precautions apply to operating in a dual LC environment. See “Redundant LC Operational Overview” on page 330 and become familiar with these requirements.

Network connections must be specified for both the active and standby LCs when the HSC is installed.

Library Storage Module

The LSM is a structure that provides storage for tape cartridges. A number of models interface with the HSC, and each of these models display their own characteristics:

- 4410 (Standard)
- 9310 (PowderHorn)
- 9360 (WolfCreek)
- 9740 (TimberWolf)
- SL3000 (StreamLine)
- SL8500 (StreamLine).

For specific information about SL3000 and SL8500 addressing and operations, refer to Appendix B, "Library Configurations" in the *HSC Installation Guide.*

Storage Capacity

In general, the storage capacity of a single LSM ranges from approximately 300 up to 6000 cartridges depending on the type of LSM, the number of cartridge drives (CDs) attached, and the number of pass-thru ports defined.

Refer to the *HSC Configuration Guide* for information about LSM storage capacity. See the appropriate StorageTek hardware operator's guide for panel definitions for each model.

Configurations

From zero to four cartridge drive panels can be attached to the exterior of an LSM. Each drive panel can contain from one to 20 transports. Openings in the walls of the LSM allow the robot to insert cartridges into the transports.

For all LSMs other than SL3000s and SL8500s libraries, up to 24 LSMs can be interconnected and cartridges can be passed from one LSM to another through a pass-thru port (PTP) in the walls of adjacent LSMs.

SL3000 Library

The SL3000 library is comprised of a single LSM for each ACS, with no passthru ports (PTPs) to other libraries. The minimum library configuration is a Base Drive Module (BDM) with one CAP and up to 24 Drives (in multiples of 8).

Optionally, one Drive Expansion module (DEM) can be added to the left of the BDM, with one CAP and up to 32 additional drives (in multiples of 8). One to four Cartridge Expansion Modules (CEMs) can be added left and right of the BDM, with an optional CAP installed in each CEM. In all cases where the optional CAP and Drives are not installed, the panel will contain cartridge cells.

On each end of the SL3000 is the Access Expansion Module (AEM), which contains no cell slots. This module offers a bulk CAP option that allows up to 234 cartridges (18 13-cell magazines) to be entered or ejected.

Dual Robot SL3000 libraries will have a Parking Expansion module (PEM) on each end of the library. A PEM takes the next available CEM location or replaces an existing CEM on a fully configured SL3000 Library.

SL8500 Library

The SL8500 library contains four rails on which four handbots travel. Optionally, you can upgrade to eight handbots, two per rail, for redundancy. The HSC considers each SL8500 rail as a separate LSM.

Refer to Appendix B, “Library Configurations,” in the *HSC Installation Guide* for more SL3000 and SL8500 configuration information.

Cartridge Movement

With the exception of the SL3000 and SL8500 libraries, if a cartridge is in one LSM and the assigned transport is attached to another LSM, the robot retrieving the cartridge from its home cell places it into a PTP. The robot in the adjacent LSM retrieves the cartridge from the PTP and mounts it on the assigned transport, or places it into another PTP to continue passing the cartridge to the destination LSM.

The SL3000 is a single LSM containing no internal or external PTPs to link multiple SL3000 libraries together. Refer to Appendix B, “Library Configurations,” in the *HSC Installation Guide* for more information.

The SL8500 contains three internal PTPs (elevators) that move cartridges between LSMs (rails). External PTPs can be used to link multiple SL8500s. Refer to Appendix B, “Library Configurations,” in the *HSC Installation Guide* for more information.

Each LSM has an access door in the outer wall that allows human access to the interior. The access door contains a cartridge access port (CAP) that allows cartridges to be entered and ejected without interrupting automated operations in the LSM.

An attached Library Control Unit (LCU) manages each LSM. When it receives a request from the LMU, the LCU commands the LSM robot to move to the storage cell, CAP, PTP, or transport where the cartridge is located, and perform the proper operation (mount, dismount, or move to/from a cell location, CAP, or PTP).

Mount Process

When an LSM robot mounts a cartridge, it performs the following actions:

1. The servo system moves the robot’s fingers to the center of the cell location.
2. In LSMs other than the SL3000s and SL8500s, a solid-state camera vision system in the LSM fine-positions the robot’s fingers. The SL3000 and SL8500 libraries do not contain a vision system.
3. The camera validates the external Tri-Optic label on the cartridge.
4. The robot retrieves the cartridge from the cell.
5. The robot moves to the specified transport and mounts the cartridge.

Dismount Process

When a dismount is requested, the robot removes the cartridge from the transport and does one of the following:

- returns the cartridge to the source cell if pass-thru operations were not required to mount the volume
- places the cartridge in an available cell in the robot's LSM if pass-thru operations were required to mount the volume. (Normally, pass-thru operations are not performed to place a cartridge in a storage cell after it has been dismounted, as long as an available cell exists in the LSM.)
- if specifically directed to return the cartridge to its original home cell location (using the MNTD Float OFf command), the robot places the cartridge into a PTP cell to begin passing it back to the original LSM.

☞ **Note:** Refer to "Controlling Pass-Thru Operations After Dismount" on page 341 for instructions on using the MNTD Float OFf command.

HSC-to-ACS Operating Modes

The terms ‘‘disconnected mode’’ and ‘‘connected mode’’ refer to the relationship between the HSC and an ACS. An ACS may be connected to one host while being disconnected from another. Moreover, a single host may be attached to several ACSs, some of which are connected to the HSC, and some of which are disconnected from it.

In a functional dual LMU configuration, the ACS can be in a condition referred to as ‘‘standby mode.’’

Connected Mode

An HSC is connected to an ACS when both of the following conditions are true:

- The HSC is executing on that particular host.
- The host and the ACS are communicating with a minimum of one station online to the ACS (a station is the connection between the host and the Library Management Unit).

While the HSC is connected to the ACS, messages from the host are intercepted by the HSC and routed to the ACS which automates the mounts and dismounts.

Disconnected Mode

An HSC is disconnected from an ACS when both of the following conditions are true:

- The HSC is executing on that particular host.
- The host and the ACS are not communicating (no stations are online to the ACS from that particular host).

In disconnected mode, no automated tape activity can occur for this host using this ACS.

In a multiple-host environment, however, since the ACS is still capable of automated operations, you can semi-automate mounts and dismounts by issuing HSC commands from a connected host’s console. As mount/dismount messages are displayed on the disconnected host’s console, you can issue HSC Mount and DISMount commands from the connected host’s console to direct the LSM robots to perform the mounts and dismounts (as long as the cartridges are not selected by the disconnected host).

Standby Mode

An HSC is connected to an ACS in standby mode when the following conditions are true:

- The dual LMU feature has been installed.
- No stations are online to the master LMU.
- At least one station is online to the standby LMU.

In standby mode, the HSC intercepts mount and dismount messages and accepts operator cartridge movement commands. The HSC cannot send requests to the master LMU, however, since no stations are online. The operator can resolve this situation by issuing the HSC SWitch command causing the standby LMU to become the master LMU. When the standby LMU has assumed master LMU functionality, the HSC sends all pending (or saved) LMU requests to the new master LMU.

LSM Operating Modes

An LSM operating mode is the way in which an LSM and all the HSCs attached to it interact. The two operating modes are automatic and manual. Automatic mode is the normal operating mode of an LSM. An LSM is either in automatic mode to all hosts or in manual mode to all hosts.

Automatic Mode

An LSM operating in automatic mode does not require operator intervention for mounting, dismounting, swapping, or pass-thru cartridge movement. When the LSM is in automatic mode, the operator can use console commands or HSC batch utility processing to enter or eject cartridges through the CAP.

Manual Mode

An LSM operating in manual mode cannot perform any automated operations. The operator must intervene and perform all mounts and dismounts manually.

Caution: StorageTek strongly recommends that you do not place SL3000 and SL8500 libraries in manual mode. To use manual mode, all LSMs in the SL8500 must be offline, and that means all CAPs and drives are unavailable for automated operations.

Additionally, SL8500s have been designed for high cartridge density, so there is limited room for manually mounting and dismounting cartridges.

Refer to the “Precautions” topic in the *SL8500 Modular Library System User’s Guide* for safety requirements and physical restrictions if you decide that you must enter the library.

Chapter 2. Commands, Control Statements, and Utilities

Introduction

HSC operator commands and library utilities allow an operator to allocate, display the status of, and manage library resources.

This chapter discusses operator commands in detail and gives a brief overview of library utilities. The following topics are discussed:

- primary requirements
- overview of command syntax
- HSC commands and control statements
- SCP commands
- GCS command
- CMS commands
- library utilities overview.

The HSC subsystem must be operational before most of these commands and utilities can be executed.

Notes:

- For a detailed description of library utilities, refer to the *HSC System Programmer's Guide*.
- HSC messages and codes are described in detail in the *HSC Messages and Codes Guide*.
- SCP messages and codes are described in detail in the *SCP Messages and Codes Guide*.

Primary Requirements

Command Authorization

Commands are only accepted from virtual machines authorized for command privileges by an SCP AUTHorize command. (Refer to "Authorize Command" on page 250 for details on the AUTHorize command syntax and parameters). Authorization is required regardless of the method used to submit commands. Commands issued from any other virtual machine are logged but not processed. A response of `Invalid command` is returned to the sender.

Methods of Issuing Commands

There are several methods for issuing commands to the control program and tasks executing in the SCP environment.

- ACS EXEC sends a command to the service machine via CP SMSG. The operator is not required to know the name of the service machine.
- CP SMSG sends a command to the service machine directly.
- CP IUCV transmits input to the service machine.
- An operator may issue commands from the connected virtual console.
- Remote operators are fully supported from both VM and MVS nodes.

Note: The GCS component service machine only accepts commands via CP SMSG and the virtual console.

ACS EXEC

The ACS EXEC is the primary user interface to the ACS service machine. It provides several key functions:

- Transmits commands to the ACS service machine
- Initializes the SCP and the HSC on the ACS service machine
- Sends batch jobs to the ACS service machine
- Creates utility job streams with JCL and control statement templates.

Refer to "ACS EXEC" on page 290 for details on the ACS EXEC syntax and parameters.

CP SMSG

To send a command to the ACS service machine using the CP Special Message (SMSG) facility, issue the following command from any virtual machine authorized to issue commands to the ACS service machine.

```
►►─CP──SMSG──acs-userid──command-string──────────────────────────────────►◄
```

where:

acs-userid
is the name of the ACS service machine defined in the CP directory (refer to “HSC Control Statements and HSC Start Procedure” in the *HSC System Programmer’s Guide*).

Note: Substitute *gcs-userid* for *acs-userid* to send a command to the GCS component service machine.

command-string
is a character string containing any valid SCP or HSC operator command.

IUCV

A command may be issued to the ACS service machine using the CP Inter-User Communication Vehicle (IUCV) from any virtual machine authorized to issue commands to the ACS service machine. Refer to the *HSC System Programmer’s Guide* for more information about IUCV.

Service Machine Virtual Console

An operator may log on to the service machine at a terminal device and issue commands from the connected virtual console.

Remote Operators

Remote operators can issue commands to the service machine by entering either the following command:

```
►►─CP──SMSG──RSCS──MSG──nodeid──acs-userid──command-string───────────────►◄
```

where:

nodeid
is the symbolic name assigned to a specific node.

acs-userid
is the name of the ACS service machine defined in the CP directory (refer to "HSC Control Statements and HSC Start Procedure" in the *HSC System Programmer's Guide*).

command-string
is a character string containing any valid SCP or HSC operator command.

or, if the ACS service machine is defined in a NAMES file, then enter the command:

```
►►─TELL──nickname──command-string──────────────────────────────────────►◄
```

where:

nickname
is the NAMES file identifier for the ACS service machine.

command-string
is a character string containing any valid SCP or HSC operator command.

Overview of Command Syntax

This section contains operator command rules and conventions used in this chapter to describe command syntax.

Syntax Specification

- The following symbols should be coded as they appear in the command format:

asterisk	*
colon	:
comma	,
hyphen	-
parentheses	()
period	.
single quote	‘
slash	/

Note: Except for HSC operator commands, trailing right parentheses are optional.

- When there is no conflict, keywords are optional.
- Parameters for SCP commands may only be separated by blanks. The Reply command is an exception, however, and allows the use of either a comma or blanks as separators.
- A token is defined as a character string delimited by recognized delimiters. A token has no maximum length.
- The following characters are recognized delimiters:

  blank (x”40”)
  null (x”00”)
  comma (x”6B”)
  left parenthesis (x”4D”)
  right parenthesis (x”5D”).

Command Format

- All commands are considered to be in free format. This means that there is no column dependency.
- There is no statement continuation facility. Each statement must be complete within a single line or input record.
- Blank and null (line length = 0) lines are ignored, but are copied to the console log.
- The length of any command string must not exceed 130 bytes.
- The number of tokens must not exceed 32. Each nonblank/non-null delimiter counts towards this total.
- No logical line end character is supported.

- An unaltered copy of the command string is kept at all times. In addition, token services may force a token to uppercase.
- Some commands are handled by a subsystem. These commands are prefixed by a special character for that subsystem, concatenated (immediately) with the command string.

Command Search Order

1. If the first token is SLK, the command is treated as an SCP command.
2. If the first nonblank character is an asterisk ‘‘*,’’ then the line is considered to be a comment.
3. Blank or null lines are logged.
4. If none of the above conditions apply, the command is broadcast to all active HSC subsystems. A subsystem may take the command and process it in its own way.
5. If no subsystem takes it, the command is checked against the list of SCP commands. If it is a valid SCP command, then it is processed.
6. If no subsystem takes it and it is not an SCP command, the list of started tasks and jobs is compared with the first token (command verb). If there is a match, the found task is sent a message via an MVS-like ‘‘MODIFY’’ interface.
7. If the command was not processed as a result of any of the above methods, it is rejected as an invalid command.

Command replies are always sent to the issuing console and, in some cases (such as mounts and dismounts), are routed to other consoles such as the tape library console or master system console.

Command Execution Order

Immediate Commands

The following SCP commands execute immediately:

* (comment)
DUMP
Query
Reply
SET DUMPOpts

Serial Commands

The SCP commands listed below execute in the order received with no overlap. They are processed by a subtask.

AUTHorize
DEFine
FILE SET
CONSlog

SET PERFlog
SET TRACE
SUBSYS

Task Commands

The SCP commands listed below execute in no particular order. They may compete for shared resources and wait for asynchronous events.

CANCEL
CP
HELP
SET
MSGtype
STArt
STOP
STOPSCP

Subsystem Commands (includes HSC commands)

Subsystem commands are each handled by a separate task. Due to this multitasking nature, commands may compete with each other for resources. As a result, the order of execution of HSC commands is in no way related to the order in which they were received.

HSC commands can be prefixed with a prefix character which is defined in the LIBGEN SLILIBRY macro. Refer to “Creating the Library Configuration File (LIBGEN)” in the *HSC Installation Guide* for information on LIBGEN macros.

Operator Command Syntax Rules

An HSC operator command consists of a command prefix character (optional), a command name, and zero or more positional parameters and keyword parameters. Rules governing these commands are listed below.

- The optional command prefix character identifies which subsystem processes the command. The systems programmer defines this prefix character (for example, “.,” “#,” “@”) during the LIBGEN process.
  - If a prefix character is used, the command must appear immediately following (concatenated to) the prefix character.
  - A null character can be specified as the command prefix character. When the command prefix is a null character, you must use the SCP MODIFY command to state commands to the HSC. The format for the SCP MODIFY command is as follows:

    ```
    taskname hsc-command
    ```

where:

taskname
is the HSC task name, which is the jobname on the /JOB statement of the startup SLKJCL.

hsc-command
is any valid HSC command and zero or more parameters.

An example of how a specific HSC command can be issued is:

```
taskname MOUNT 123456 B04
```

Note: The examples shown in this chapter do not show the use of a command prefix character. Use of a prefix character is illustrated in the examples found in other chapters in this guide.

- Keyword parameters that require or allow a user-supplied value can be specified in either of following formats:
  - Enclosing the user-supplied value(s) in parentheses and concatenating it to the keyword. For example,

    HOSTID(*host-id*)

  - Concatenating the user-supplied value(s) to the keyword with an equal sign. For example,

    HOSTID=*host-id*

Notes:

- Both keyword syntax formats are illustrated in this manual.
- Unless otherwise specified, a list of user-supplied values must be enclosed in parentheses. Refer to “Ranges and Lists” on page 32 for more information about specifying lists.

- Except as noted, parameters can be separated by a comma or a blank. Consecutive blanks following either of these delimiters are ignored.
- Commands and parameters can be entered in any combination of uppercase and lowercase letters.
- Command replies are always sent to the issuing console and, in some cases such as mounts and dismounts, are routed to other consoles such as the tape library console and tape pool console.

Syntax Flow Diagrams

Syntax is illustrated using flow diagrams. These can include the following elements:

- syntax — the diagram itself.
- items — individual elements inside the diagram. Items can be keywords, variables, delimiters, operators, fragment references, and separators.
- groups — a collection of items or other groups.

The following sections describe syntax flow diagram features and include some generic examples.

Specifying Commands

Commands are composed of command names, keyword parameters, and positional parameters. Command names initiate command execution, keyword parameters are operands that contain keywords and their related values, and positional parameters are operands that are identified by their position in the command string rather than by keywords.

- Keyword parameters can be specified in any order. The HSC accepts (tolerates) multiple occurrences of a keyword. The value assigned to a keyword reflects the last occurrence of a keyword within a command.
- Positional parameters must be entered in the order shown in the syntax diagram.
- Uppercase letters indicate the minimum abbreviation for the command name, keyword, or positional parameter.

Variables

Variables are italicized.

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.

Flow Lines

Syntax diagrams consist of horizontal and vertical lines and the text of a command, control statement, macro, or utility.

```
►►──COMMAND/MACRO/UTILITY──────────────────────────────────────────►◄
```

or

```
►►──┬─Item1─┬──────────────────────────────────────────────────────►◄
    ├─Item2─┤
    └─Item3─┘
```

Diagrams are read left to right and top to bottom. Arrows indicate flow and direction.

- a statement begins with ►►
- a statement ends with ►◄
- diagrams continuing to the next line begin with ►
- fragments begin and end with |

```
►►──COMMAND/UTILITY NAME──Item1(variable1)──Item2(─┬─variable2─┬─)──►
                                                   ├─variable3─┤
                                                   └─variable4─┘
►──Item3(variable5)────────────────────────────────────────────────►◄
```

Single Required Choice

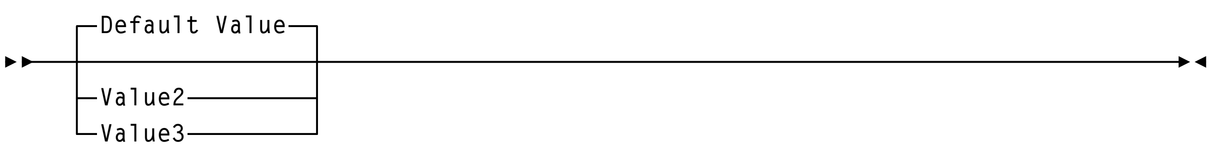
Branch lines, without repeat arrows, indicate that a **single** choice must be made. If one of the items from which a choice is being made is on the base line of the diagram, a single choice is required.

Single Optional Choice

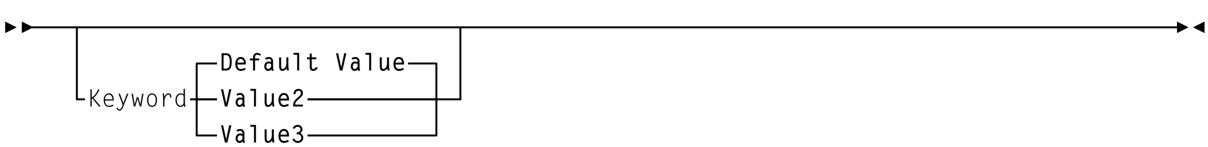
If the first item is on the line below the base line, a single choice of items in the stack is optional.

Defaults

Default values and parameters appear above the syntax diagram line. In the following example, if a value is not specified with the command, Default Value is used by the HSC.

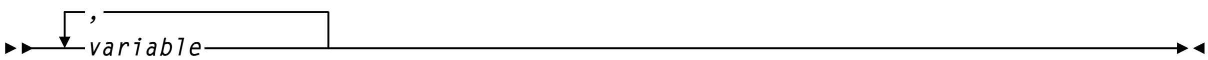


Some keyword parameters provide a choice of values in a stack. When the stack contains a default value, the keyword and the value choices are placed below the baseline to indicate that they are optional, and the default value appears above the keyword line. In the following example, if the keyword is not specified with the command, `Keyword(Default Value)` is used by the HSC.



Repeat Symbol

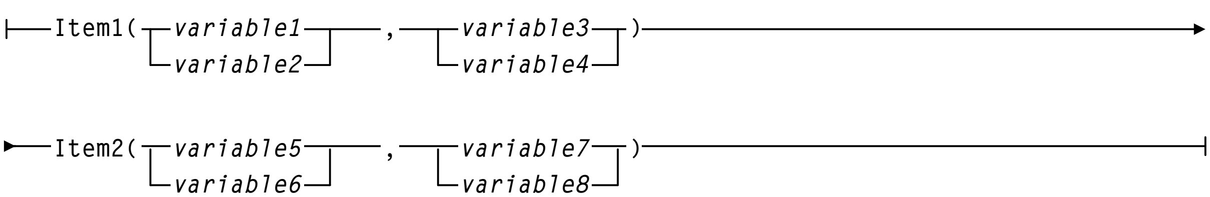
A repeat symbol indicates that more than one choice can be made or that a single choice can be made more than once. The repeat symbol shown in this example indicates that a comma is required as the repeat separator.



Syntax Continuation (Fragments)

Fragment references direct you to parts (fragments) of the syntax that contain more detail than can be shown in the main syntax diagram.

Fragment:



How to Read Syntax Flow Diagrams

To read command syntax, start at the double arrowheads (II) on the left and move to the right adding syntax elements as you go.

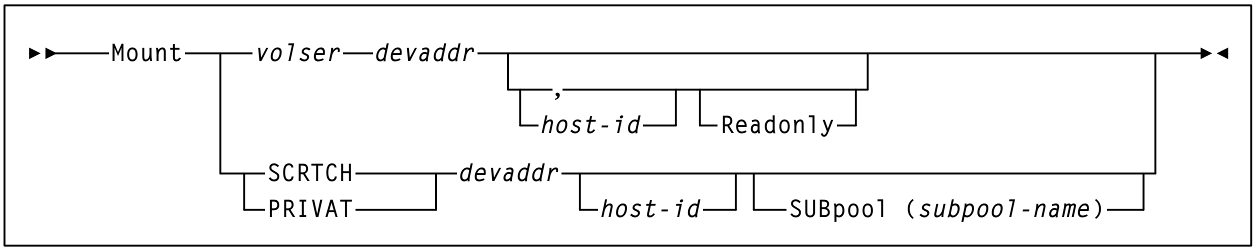
- At line intersections, choose a path to take.
- Continue following the chosen path to the right (do not backtrack).
- Any element you cannot bypass is required.
- Any element shown above the line is a default.
- Any element shown below the line that you can bypass is an option.
- The diagram ends at the two arrowheads facing each other (►◄).

The syntax for some commands is too large to fit on one line. These diagrams are split, which is indicated by ending the unfinished line and beginning the next line with a single arrowhead (►).

Syntax Flow Diagram Example

Consider the syntax flow diagram for the Mount command.

Syntax Flow Diagram Example (Mount Command)



To read the syntax flow diagram for the Mount command:

- Start at (II) and follow the line to the right to the word Mount. Mount cannot be bypassed so it is required: it can be abbreviated to ‘‘M.’’
- Continuing to the right there is a split, indicating a choice. You **must** choose either *volser,* SCRTCH, or PRIVAT.
- Continuing along either path, the required variable *devaddr* cannot be bypassed and is required. Substitute a device address for *devaddr.*
- Continuing along either path again, the following optional choice is presented:
  - Bypass the choice and go straight to (►◄); no other coding is necessary.
  - Include any of the following parameter combinations:
    - *host-id* and nothing else, or
    - *host-id* and either Readonly or Subpool(*subpool-name*), or
    - a comma and Readonly, or
    - Subpool(*subpool-name*).

The following are all valid ways to issue a Mount command for a specific VOLSER:

```
MOUNT volser devaddr
MOUNT volser devaddr host-id
MOUNT volser devaddr host-id READONLY
MOUNT volser devaddr,,READONLY
```

Library Identification

Each ACS, LSM, and CAP is assigned a unique identification number during LIBGEN. Use this number in HSC commands and utilities when identifying a specific ACSid, LSMid, or CAPid.

- ACSid (*acs-id*) is a hexadecimal value from 00 through FF that identifies the LMU.

  An *acs-id* is the result of defining the SLIALIST macro during a LIBGEN. See the *HSC Installation Guide* for information about the SLIALIST macro. The first ACS listed in this macro acquires a hexadecimal identifier of 00, the second ACS listed acquires a hexadecimal identifier of 01, and so forth until all ACSs are identified.

- An LSM number (*ll*) is a hexadecimal value from 00 through 17. It differentiates an LSM from every other LSM connected to the same LMU.

  An LSM number is the result of defining the SLIACS macro LSM, LSM2, LSM3, and LSM4 parameters. See the *HSC Configuration Guide* for information about the SLIACS macro. The first LSM listed for an ACS acquires a hexadecimal number of 00, the second LSM listed for an ACS acquires a hexadecimal number of 01, and so forth.

- An LSMid (*lsm-id*) is made up of the ACSid and the LSM number separated by a colon (:). It differentiates an LSM from every other LSM in a library.
- A CAP number is a hexadecimal value from 00 to 02 for all existing libraries, except for SL3000 libraries; the CAP number is a hexadecimal value from 00 to 0B. The CAP number identifies a specific CAP in an LSM that has more than one CAP.
- A CAPid (*cap-id*) is a hexadecimal value made up of the LSMid and the CAP number separated by a colon. Refer to "How to Specify a CAPid" on page 29 for additional information.

Some HSC commands and utilities require, or optionally allow, the user to specify a host identifier or a VOLSER.

- The *host-id* for a given host is the identifier specified in the HOSTID parameter of the SLILIBRY macro in the LIBGEN. Valid characters for a HOSTID are A-Z, 0-9, # (crosshatch), $, and @.
- A VOLSER (*volser*) identifies a volume serial number consisting of one to six characters. Valid characters are A-Z, 0-9, #, $, ¥ (yen character), and optional trailing blanks. Leading blanks are not allowed.

How to Specify a CAPid

A CAPid specifies a particular CAP in the library. Each CAP is identified by the LSMid of the LSM that the CAP is attached to and a CAP number to distinguish it from other CAPs in that LSM.

CAP configurations differ based on the LSM type. The following configurations are possible:

LSM (Model 4410) and PowderHorn LSM (Model 9310)
This LSM is configured with either the standard 21-cell CAP or an enhanced CAP. An enhanced CAP contains two 40-cell magazine-style CAPs and a one-cell priority CAP (PCAP). The 40-cell CAPs function independently.

WolfCreek LSM (Models 9360-050, 9360-075, and 9360-100)
This LSM is configured with a WolfCreek CAP which contains a 20-cell magazine-style CAP and a PCAP. An optional 30-cell, magazine-style CAP, called a WolfCreek optional CAP, may be added to the WolfCreek CAP.

TimberWolf LSM (Model 9740)
This LSM is configured with either a 14-cell permanent rack or a 10-cell removable magazine.

StreamLine Library (Model SL3000)
The library is configured with 2, 13-cell removable magazines in each CAP. This library can contain up to 12 CAPs (00-0B). CAP addresses 00 and 0B, located in the Access Expansion Modules (AEMs), are unused in the initial release of the library.

StreamLine Library (Model SL8500)
This library is configured with 3, 13-cell removable magazines. An optional 39-cell CAP can be added.

CAPid Formats

There are two formats that can be used to specify a CAPid:

- *AA:LL*, where *AA* is the ACSid (hexadecimal 00 through FF) and *LL* is the LSM number (hexadecimal 00 through 17). This format is referred to as the *lsm-id*.
- *AA:LL:CC*, where *AA:LL* is the LSMid and *:CC* is the CAP number. This format is referred to as the *cap-id*.

The appropriate format to use is determined by the CAP hardware and the command being specified.

- The *AA:LL* format can be specified in the following situations:
  - to specify a standard CAP
  - to allow the HSC to select a CAP based on CAP preference.

- The *AA:LL:CC* format can be specified for any CAP hardware in any command that accepts a CAPid. This is the preferred format. Valid CAP numbers are:

  00 indicates one of the following:

  - a 21-cell 4410 or 9310 standard CAP
  - the right-hand 40-cell 4410 or 9310 enhanced CAP
  - the 20-cell 9360 WolfCreek CAP
  - a 14-cell or 10-cell removable magazine 9740 TimberWolf CAP
  - a left-side SL3000 AEM CAP, consisting of 18, 13-cell removable magazines
  - the left-hand 39-cell SL8500 library CAP.

  Note: The LSM portion of the SL8500 CAP must be the LSM number of the LSM on track 1 of the structure.

  01 indicates one of the following:

  - the left-hand 40-cell 4410 or 9310 enhanced CAP
  - the 30-cell 9360 WolfCreek optional CAP
  - an optional SL3000 CEM CAP consisting of 2, 13-cell removable magazines
  - the right-hand optional 39-cell SL8500 library CAP.

  02 indicates one of the following:

  - PCAP in either a 4410 or 9310 enhanced CAP or a 9360 WolfCreek CAP.
  - an optional SL3000 CEM CAP consisting of 2, 13-cell removable magazines.

  03, 04, 05 indicates the following:

  - an optional SL3000 CEM/DEM CAPs each consisting of 2, 13-cell removable magazines.

  06 indicates the following:

  - the only required SL3000 BDM CAP consisting of 2, 13-cell removable magazines.

  07, 08, 09, 0A indicates the following:

  - an optional SL3000 CEM CAPs each consisting of 2, 13-cell removable magazines.

  0B indicates the following:

  - a right-side SL3000 AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as “not installed” This keeps CAP addresses from changing as new CAPs are added.
- Refer to the individual command explanations for additional information on specifying CAPids.
- SL3000 and SL8500 libraries do not contain a PCAP.

Ranges and Lists

HSC commands and utilities often allow the user to specify ranges and lists of elements.

- 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.
  - A hexadecimal range consists of a pair of hexadecimal numbers (for example, 0A2-0AD, or 000-0FC).
  - A decimal range consists of a pair of decimal numbers (for example, 1-9, or 010-094). Leading zeros are not required.
  - A numeric VOLSER range (*vol-range*) consists of a pair of VOLSER elements containing a decimal numeric portion of 1 to 6 digits (for example, ABC012-ABC025, or X123CB-X277CB). The decimal portion is referred to as an incremental range. The following additional restrictions apply:
    - The character positions of the incremental portion of both range elements must match.
    - The non-incremental characters of the first element must be identical to those of the second element.
    - You cannot increment two portions of a range element. If 111AAA is the first element, you cannot specify 112AAB for the second element.
    - If a VOLSER range contains more than one decimal portion, any portion is valid as the incremental range. For example:

A00B00	the largest range that can be specified is A00B00 through A99B99.
A0B0CC	the largest range that can be specified is A0B0CC through A9B9CC.
000XXX	the largest range that can be specified is 000XXX through 999XXX.

Note: A VOLSER range for most operator commands is limited to 100 entries. If a larger range is entered, only the first 100 VOLSERs in the range are acted on. If HSC utilities are used, the entire range is processed.

  - An alphabetic VOLSER range (*vol-range*) consists of a pair of VOLSER elements containing an incremental portion of 1 to 6 characters (for example, 000AAA-000ZZZ, or 9AAA55-9ZZZ55). This portion is referred to as an incremental range. The following additional restrictions apply:
    - The character positions of the incremental portion of both range elements must match.
    - The non-incremental characters of the first element must be identical to those of the second element.

- You cannot increment two portions of a range element. If 111AAA is the first element, you cannot specify 112AAB for the second element.
- The alphabetic portion of the VOLSER range is defined as being from character A to Z. To increment multi-character sequences, each character increments to Z. For instance, ACZ is part of the AAA-AMM range. Examples are:

A00A0-A99A0	increments VOLSERs A00A0 through A09A0, then A10A0 through A99A0.
9AA9A-9ZZ9A	increments VOLSERs 9AA9A through 9AZ9A, then 9BA9A through 9ZZ9A.
111AAA-111ZZZ	increments VOLSERs 111AAA through 111AAZ, then 111ABA through 111ZZZ.
999AM8- 999CM8	increments VOLSERs 999AM8 through 999AZ8, then 999BA8 through 999CM8
A3BZZ9- A3CDE9	increments VOLSERs A3BZZ9 through A3CAA9, then A3CAB9 through A3CDE9
AAAAAA-AAACCC	increments VOLSERs AAAAAA through AAAAAZ, then AAAABA through AAACCC
CCCNNN-DDDNNN	increments VOLSERs CCCNNN through CCCNNZ, then CCCNOA through DDDNNN*

* **Caution:** This is a very large range.

The number of volumes in an alphabetic VOLSER range depends on the number of elements in the incrementing portion of the VOLSER range. 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.

A-Z	26^1	26
AA-ZZ	26^2	676
AAA-ZZZ	26^3	17,576
AAAA-ZZZZ	26^4	456,976
AAAAA-ZZZZZ	26^5	11,881,376
AAAAAA-ZZZZZZ	26^6	308,915,776

Note: For most operator commands, a VOLSER range is limited to 100 entries. If a large range is entered, only the first 100 VOLSERs are acted upon. If HSC utilities are used, the entire range is processed.

- 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 list enclosed in parentheses.
    - For some HSC operator commands, an element may consist of a single item or a range. Refer to the individual command explanations for valid list entries.
    - In general, HSC utilities **do not allow** ranges to be specified in a list. The exception to this is a VOLSER list (*vol-list*) which does allow ranges to be specified. For VOLATTR control statements, you can use wildcard characters (%, ?, or *) to identify a list of VOLSERs.

Table 1. Library Identifiers

Library Identifier	Command Syntax	Input Format	Description
ACS Identifier (ACSid)	*acs-id*	*AA*	Hexadecimal value (00-FF); identifies the selected LMU.
ACSid Range	*acs-range*	AA^1 -AA^2	Two ACSids joined by a dash, where $aa^1 < aa^2$.
ACSid List	*acs-list*	(AA^1 ,AA^2 - AA^3 , AA^4 ,...,AA^n)	List of ACSids and/or ACSid ranges in any combination, enclosed in parentheses.
LSM Number	*l l*	*LL*	Hexadecimal value (00-17); differentiates an LSM from other LSMs in an ACS.
LSM Identifier (LSMid)	*lsm-id*	*AA:LL*	Differentiates an LSM from other LSMs in a library.
LSMid Range	*lsm-range*	$AA:LL^1$ -$AA:LL^2$	Two LSMids joined by a dash, where $AA:LL^1 < AA:LL^2$.
LSMid List	*lsm-list*	($AA:LL^1$,$AA:LL^2$ - $AA:LL^3$, $AA:LL^4$,...,$AA:LL^n$)	List of LSMids and/or LSMid ranges in any combination, enclosed in parentheses.
CAP Identifier (CAPid)	*cap-id or lsm-id*	*AA:LL:CC or AA:LL*	Identifies a specific CAP, where *AA:LL* is the LSMid and CC is the CAP number. Valid CAP numbers are 00 through 0B. **Note:** An *lsm-id* can be used to allow the HSC to select a CAP in a particular LSM based on CAP preference.
CAPid Range	*cap-range*	$AA:LL^1$ -$AA:LL^2$ or $AA:LL:CC^1$ -$AA:LL:CC$ 2	Two CAPids joined by a dash, where $AA:LL^1 < AA:LL^2$, or $CC^1 < CC^2$.
CAPid List	*cap-list*	($AA:LL:CC^1$, $AA:LL:CC^2$ -$AA:LL:CC^3$, $AA:LL:CC^4$,...,$AA:LL:C^n$)	List of CAPids and/or CAPid ranges in any combination, enclosed in parentheses. The abbreviated CAPid format may be used for some HSC commands.
VOLSER	*volser*	*VVVVVV*	Single volume serial number.
VOLSER range	*vol-range*	*VVVXXX-VVVYYY* or *VVVVVX-VVVVVY* or *XVVVVV-YVVVVV* or	Two volume serial numbers joined by a dash. The incremental portions must be in the same character positions.

Table 1. Library Identifiers

Library Identifier	Command Syntax	Input Format	Description
VOLSER list	*vol-list*	*(VVVAAA, VVVBBB, VVCCVV-VVDDVV, ..., XXXVVV-YYYVVV, VZZZVV, ...)*	List of one or more VOLSERs and/or VOLSER ranges in any combination, enclosed in parentheses.

HSC Commands and Control Statements

HSC operator commands and control statements provide status information about the library, and allow an operator to control volume movement within the library and change the status of library resources.

HSC Commands

Command syntax and parameter explanations are provided for each of the following HSC operator commands:

- CAPPref
- CDs
- CLean
- COMMPath
- DISMount
- Display
- DRAin
- EJect
- ENter
- Journal
- MNTD
- MODify
- MONITOR (MN)
- Mount
- MOVe
- OPTion
- RECover
- RELease
- SCRAtch
- SENter
- SRVlev
- STOPMN (PM)
- SWitch
- TRace
- TRACELKP
- UNSCRatch
- Vary
- VIew
- Warn

UUI Command Support

The Unified User Interface (UUI) supports several output formats for a number of operator commands. Formats include plain text, structured XML, and comma separated values (CSV). Refer to the *NCS/VTCS XML Guide* for supported commands, XML tag names and structure for all UUI requests.

Control Statements

Certain HSC commands can also be used as PARMLIB control statements which are executed at HSC initialization. PARMLIB control statements enable you to tailor HSC startup options to the requirements of your data center. Unless otherwise specified, the options defined in a control statement can be dynamically changed during normal operations by issuing the corresponding HSC operator command.

Note: Refer to “HSC Control Statements and HSC Start Procedure” in the *HSC System Programmer’s Guide* for more information about PARMLIB control statements.

HSC Service Levels

The HSC subsystem can operate at either of two service levels:

- base service level
- full service level.

Normally the HSC initializes to the full service level when started. The HSC can be started at the base service level, however, and then brought to the full service level at any time by issuing the SRVlev FULL command. Refer to "SRVlev (Service Level) Command" on page 212 for details on command syntax and parameters.

Base Service Level Functions

The base service level is the nucleus of the HSC subsystem. It provides the functions necessary to execute as an extension of the operating system, and satisfies the requirements defined by the operating environment in place at the time of execution.

All operator commands can be issued with the HSC executing at the base service level. Commands that involve library hardware, however, cannot perform their function completely.

Pending Mount Request During Base Service Level Operations

Mount requests for transports attached to the ACS are left pending whenever the HSC is operating at the base service level. When the HSC is brought up to the full service level, all outstanding mount requests are processed and the mounts performed.

Full Service Level Functions

The full service level of operation for the HSC provides all of the functions available and necessary to invoke and sustain complete library operations. These functions include:

- mount/dismount processing
- CAP processing
- cartridge and cell inventory management
- LMU access
- library resource recovery
- support for all library utilities
- support for all HSC commands.
- support for programmatic interface

Table 2 on page 39 identifies the HSC commands that can execute at both the base and full service levels, and those that can execute only at the full service level.

Table 2. HSC Command Execution at Base and Full Service Levels

Command	Service Level Execution	
	Base	**Full**
CAPPref	NO	YES
CDs	YES	YES
CLean	NO	YES
COMMPath	YES	YES
DISMount	NO	YES
Display	YES	YES
DRAin	NO	YES
EJect	NO	YES
ENter	NO	YES
Journal	YES	YES
LIst	YES	YES
MNTD	NO	YES
MODify (F)	NO	YES
MONITOR (MN)	YES	YES
Mount	NO	YES
MOVe	NO	YES
OPTion	YES	YES
RECover	NO	YES
RELease	NO	YES
SCRAtch	YES	YES
SENter	NO	YES
SRVlev	YES	YES
STOPMN (PM)	YES	YES
SWitch	NO	YES
TRace	YES	YES
TRACELKP	YES	YES
UNSCRatch	YES	YES
Vary	NO	YES
VIew	NO	YES

Table 2. HSC Command Execution at Base and Full Service Levels

Command	Service Level Execution	
	Base	**Full**
Warn	NO	YES

CAP Preference (CAPPref) Command and Control Statement

The CAPPref command and control statement is used for the following:

- Assign a preference value to one or more designated Cartridge Access Ports (CAPs) in the ACS.
- Place a CAP into automatic or manual mode.

Each LSM may contain one or more CAPs which allow you to enter and eject cartridges without interrupting automated operations. Several HSC commands and utilities require the use of a CAP and give you the option to either specify the CAP you want to use or allow the HSC to automatically select which CAP to use. When you allow the HSC to make the selection, a CAP is chosen based on availability and CAP preference value. Assigning CAP preference values establishes an ordered list of CAPs from which the HSC selects an available CAP with the highest nonzero preference value.

A CAP's preference value is zero until it is changed by a CAPPref command. Zero preference CAPs are never automatically selected by the HSC; however, they can be explicitly requested by the user.

CAPPref can be issued as an operator command or specified in PARMLIB. Refer to "HSC Control Statements and HSC Start Procedure" in the *HSC System Programmer's Guide* for information about PARMLIB.

- A CAP preference value is only in effect on the host that executes the command.
- CAP mode (automatic or manual) is in effect on all hosts system-wide for each CAP; it cannot be set discretely for each host.

CAPPref Considerations

CAP preference values are retained in the control data set from one HSC start to another.

- If the CAPPref command is contained in PARMLIB, do not code the AUTO or MANual setting. If these settings are used and the CAP is already in the selected mode, the command is rejected without changing the preference value.
- If the CAPPref command is contained in PARMLIB when the HSC is brought up, and the command can be executed by the host being started:
  - Each CAP is assigned the preference value that is specified in PARMLIB.
  - Each CAP is placed in the mode that is specified in PARMLIB. This affects all hosts in the system.
- If the CAPPref command is not contained in PARMLIB when the HSC is brought up, or the command cannot be executed by the host being started:
  - Each CAP is assigned the preference value that was last recorded for it in the control data set.
  - Each CAP is placed into the state that was last recorded for it in the control data set.

Syntax

```
►►─CAPPref──prefvlue──────┬─lsm-id──────────────────┬─┬─────────┬─┬─────────┬──────►◄
                          ├─cap-id──────────────────┤ └─host-id─┘ ├─AUTO────┤
                          ├─cap-range───────────────┤             └─MANual──┘
                          │    ┌─,──────────┐       │
                          └─(──▼─cap-list───┴───)───┘
```

Command Name

CAPPref

initiates the CAP preference command or control statement.

Parameters

prefvlue

specifies a preference value which is assigned to all listed CAPs. Preference values are decimal in the range from 0-9.

A CAP with a preference value of 9 has the highest priority and is always selected first when it is available. If two or more available CAPs in an ACS have the highest preference value, the one with the lowest CAPid is selected.

Notes:

- The preference value for a PCAP must be zero. A PCAP is only used when explicitly requested by the user; the HSC does not automatically select a PCAP.
- To use the CAPPref command to place a PCAP into AUTO or MANual mode, specify a *prefvlue* of 0.
- For an SL3000 AEM CAP, the allowable preference values are 0 and 1. If a value above 1 is specified, an SLS2622I message is displayed.

lsm-id

identifies an LSM. The format of an lsm-id is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-FF).

Note: If you enter this parameter when there is more than one CAP in the specified LSM, an error message is generated.

cap-id or cap-range or cap-list

identifies one or more CAPs. The format of a cap-id is *AA:LL:CC*, where *AA:LL* is the LSMid, and CC is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as “not installed.” This keeps CAP addresses from changing as new CAPs are added.
- Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

A *cap-range* identifies an inclusive range of multi-cell CAPs; PCAPs are excluded from the range. The beginning and ending values in a range must be valid CAPids and neither CAPid can specify a PCAP. The rules for specifying ranges apply (see “Ranges and Lists” on page 32).

PCAPs must be explicitly specified in the CAPPref command.

Example 1:

```
00:00-00:03
```

In this example, CAPids 00:00 and 00:03 are standard CAPs. All CAPs in LSMs 00:01 and 00:02, except PCAPs, are included in this range.

Example 2:

```
00:00:00-00:03:01
```

In this example, CAPid 00:00:00 is either a standard CAP or a magazine-style CAP. CAPid 00:03:01 is a magazine-style CAP. All CAPs in LSMs 00:01 and 00:02, except PCAPs, are included in this range.

Example 3:

```
00:00-00:03:01
```

In this example, CAPid 00:00 is a standard CAP. CAPid 00:03:01 is a magazine-style CAP. All CAPs in LSMs 00:01 and 00:02, except PCAPs, are included in this range.

Each *cap-list* element can be either a single CAPid or a CAPid range. The elements in a list must be separated by a comma or a blank, and the entire list must be enclosed in parentheses.

host-id

specifies that the CAPPRef command is to be performed only if the host-id parameter matches the identifier of the issuing host (specified by the HOSTID parameter in the SYSPROF).

- If CAPPref is issued from PARMLIB and a host-id is specified, the command is executed only by the host with the matching ID.

- If CAPPref is issued from PARMLIB and a host ID is not specified, the command is executed by each host that accesses PARMLIB.

Refer to the *HSC System Programmer's Guide* for an explanation of PARMLIB.

AUTO

indicates that the specified CAPs are to be placed in automatic mode (referred to as auto-mode). Auto-mode CAPs remain unlocked when not in use. AUTO is the initial setting for a PCAP.

When a CAP is in auto-mode, you can initiate an enter operation without issuing an ENter command. You do this by opening the CAP door, placing one or more cartridges inside, and closing the CAP. The CAP is locked while the enter is being processed; then it is unlocked again.

Auto-mode CAPs can be used for eject processing by either:

- specifying the CAPid on an EJect command or EJECt utility, or
- assigning a preference value and allowing the HSC to automatically select the CAP.

A CAP in auto-mode is locked whenever it is selected for an eject operation, to prevent an enter operation on this CAP until the eject completes.

Note: HSC termination will be slower with CAPs in auto-mode; especially in a multiple-host environment.

MANual

indicates that the specified CAP is to be locked when not in use. MANual is the initial setting for all multi-cartridge CAPs.

Notes:

- AUTO/MANual settings are sent host-to-host using LMU broadcast and the status is preserved in the control data set. For this reason, StorageTek recommends that you not make frequent changes to the CAP mode.
- A *prefvlue* of 0 must be specified when using the CAPPref command to set a PCAP to AUTO or MANual mode.

Examples

The following examples illustrate the use of the CAPPref command and control statement.

Assign Preference Value 9 to CAPid 00:03 for Host HSC1

```
CAPPREF 9,ØØ:Ø3,HSC1
```

Note: In the example above, CAPid 003 must be a standard CAP.

To assign CAPids 002:01, 003:00, and 005:00 through 008:00 a preference value of 7 for host HSC0, the following example applies.

Assign Preference Value 7 to Listed CAPids for Host HSC0

```
CAPP 7,(ØØ:Ø2:Ø1,ØØ:Ø3:ØØ,ØØ:Ø5:ØØ-ØØ:Ø8:ØØ),HSCØ
```

Note: In the example above, all PCAPs are excluded.

To assign CAPid 00:02:00 a preference value of 9 for host HSC0 and place it in automatic mode, the following example applies.

Assign CAPid 00:02:00 Preference Value 9 & Place in Auto-Mode

```
CAPP 9,ØØ:Ø2:ØØ,HSCØ,AUTO
```

To place CAPid 00:00:02 (PCAP) into manual mode, the following example applies.

Place CAPid 00:00:02 into Manual Mode

```
CAPP Ø,ØØ:ØØ:Ø2,MANUAL
```

CDS Enable/Disable Command

The CDs command is used to enable, disable, and expand HSC control data sets on an active HSC (or, in a multiple-host environment, on all active hosts) without requiring you to bring down or substantially disrupt normal tape processes. The command allows users to:

- add and subtract CDS resources
- rename, relocate, and expand CDSs.

The primary, secondary, and standby CDS copies can be enabled, disabled, and expanded using the CDs command.

Normal tape processes that require access to the control data set are suspended only for the amount of time it takes to allocate, unallocate, and expand each CDS. All active hosts are notified of the action taken, and each host must acknowledge the change before work resumes.

All CDSs known to the subsystem are expanded at the same time with a single invocation of the CDS EXpand command, however, all newly resized CDSs must be enabled before the command is entered. The status of the CDSs can be determined using the Display CDS command. Refer to “Display CDS” on page 72 for details on the command syntax and parameters.

Warning: StorageTek recommends backing up all CDS copies prior to issuing the CDS EXpand command. Failures during the expand operation usually cause the CDS to be unusable. It is important to back up the CDS before invoking the CDS EXpand command to insure that the latest copy of the CDS is available in case of a failure during the expand operation.

Notes:

- StorageTek recommends that you do not issue CDs Enable and/or Disable commands simultaneously from multiple hosts. Doing so can cause the HSC to issue error messages. If this occurs, refer to the *HSC Messages and Codes Guide* to determine if user action is required.

- The status of all copies of the control data set can be determined using the Display CDS command. Refer to “Display CDS” on page 72 for details on command syntax and parameters.

Syntax

```
►►CDs─┬Enable──DSn(dsn)───┬────────┬───NEWVol(volser),NEWUnit(unitname)──┬─►◄
      │                   └─NEWLoc─┘                                     │
      ├Disable──┬─DSn(dsn)──┬──────────────────────────────────────────────┤
      │         ├─Primary───┤                                              │
      │         ├─SEcndry───┤                                              │
      │         └─STandby───┘                                              │
      └EXpand──────────────────────────────────────────────────────────────┘
```

Command Name

CDs
initiates the CDs command.

Parameters

Enable
allocates (brings online) a control data set copy created during subsystem initialization. The specified control data set must be named in the CDSDEF parameter data set statement in PARMLIB.

DSn
specifies the control data set name to allocate for all hosts.

dsn
is the data set name.

NEWLoc
optionally, indicates that a relocation activity has occurred for the CDS named by the **DSN** parameter.

NEWVol
specifies the volume for a relocated CDS copy. **NEWVol is a required parameter.**

volser
indicates the volume.

NEWUnit

specifies the unit name for a relocated CDS copy. **NEWUnit is a required parameter.**

unitname

indicates the unit name.

EXpand

expands all enabled CDSs to the maximum number of 4096 blocks that can fit in the physical space allocated for the CDS. The maximum number of 4096 blocks is determined by the smallest CDS copy.

Disable

deallocates (takes offline) the specified control data set. The CDs Disable command does not disable the last active copy of the control data set.

DSn

specifies the control data set name to deallocate for all hosts.

dsn

is the data set name.

Primary

indicates that the current primary control data set is to be disabled.

SEcndry

indicates that the current secondary control data set is to be disabled.

STandby

indicates that the current standby control data set is to be disabled.

Examples

The following examples demonstrate the use of the CDs command.

Enable the Control Data Set ACS.DBASECPY for All Hosts

```
CDS ENABLE DSN(ACS.DBASECPY)
```

Disable the Secondary Control Data Set for All Hosts

```
CD DISABLE SECNDRY
```

Enable Cataloged CDS ACS.DBASECPY in a New Location:

```
CDS ENABLE DSN(ACS.DBASECPY) NEWL
```

Enable Uncataloged CDS ACS.DBASECPY in a New Location:

```
CDS ENABLE DSN(ACS.DBASECPY) NEWVOL(ACSØØ1),NEWUNIT(AØØ1)
```

Initiate Expansion of Enabled CDSs:

```
CDS EXPAND
```

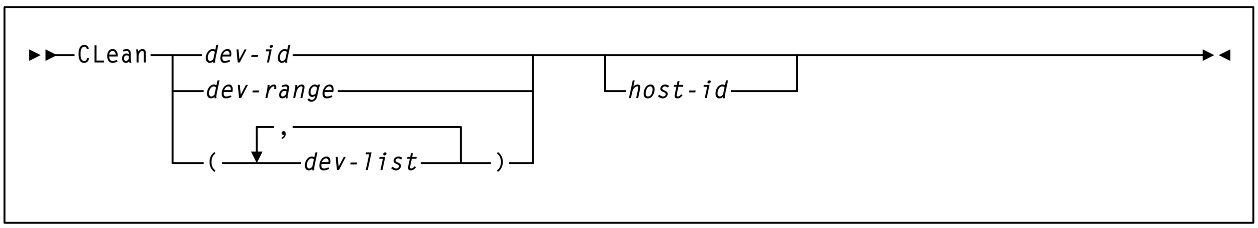
CLEAN Command

The CLean command schedules a cleaning cartridge to be mounted on a library-controlled transport. The specified transport is flagged by the control data set and a cleaning cartridge is mounted prior to the next volume mount.

Notes:

- The automated cleaning function must be enabled before you issue the CLean command. Refer to “MNTD (Mount/Dismount Options) Command and Control Statement” on page 165 for details on using the MNTD AUtocln(ON) command to enable automated cleaning.
- Use the Display MNTD command to determine whether automated cleaning is enabled or disabled. Refer to “Display MNTD” on page 100 for details on command syntax and parameters.

Syntax



Command Name

CLean
initiates the CLean command.

Parameters

dev-id or dev-range or dev-list
specifies a list of one or more device addresses for which cleaning is to be scheduled. Each dev-list element can be either a single device address or a range. The elements in a list must be separated by a comma or a blank, and the entire list must be enclosed in parentheses.

host-id
indicates that cleaning is to be performed for the device address of the specified host.

Examples

The following examples illustrate the use of the CLean command.

Schedule a Cleaning Cartridge Mount for Transport Address 564

```
CLEAN 564
```

Schedule Cleaning Cartridge Mounts for Transports 560-567

```
CL 56Ø-567
```

Schedule Cleaning for Transports 560,563,567 for Host HSC1

```
CL (56Ø,563,567) HSC1
```

Communications Path (COMMPath) Command and Control Statement

The COMMPath command and control statement is used in a multiple-host environment to perform the following functions:

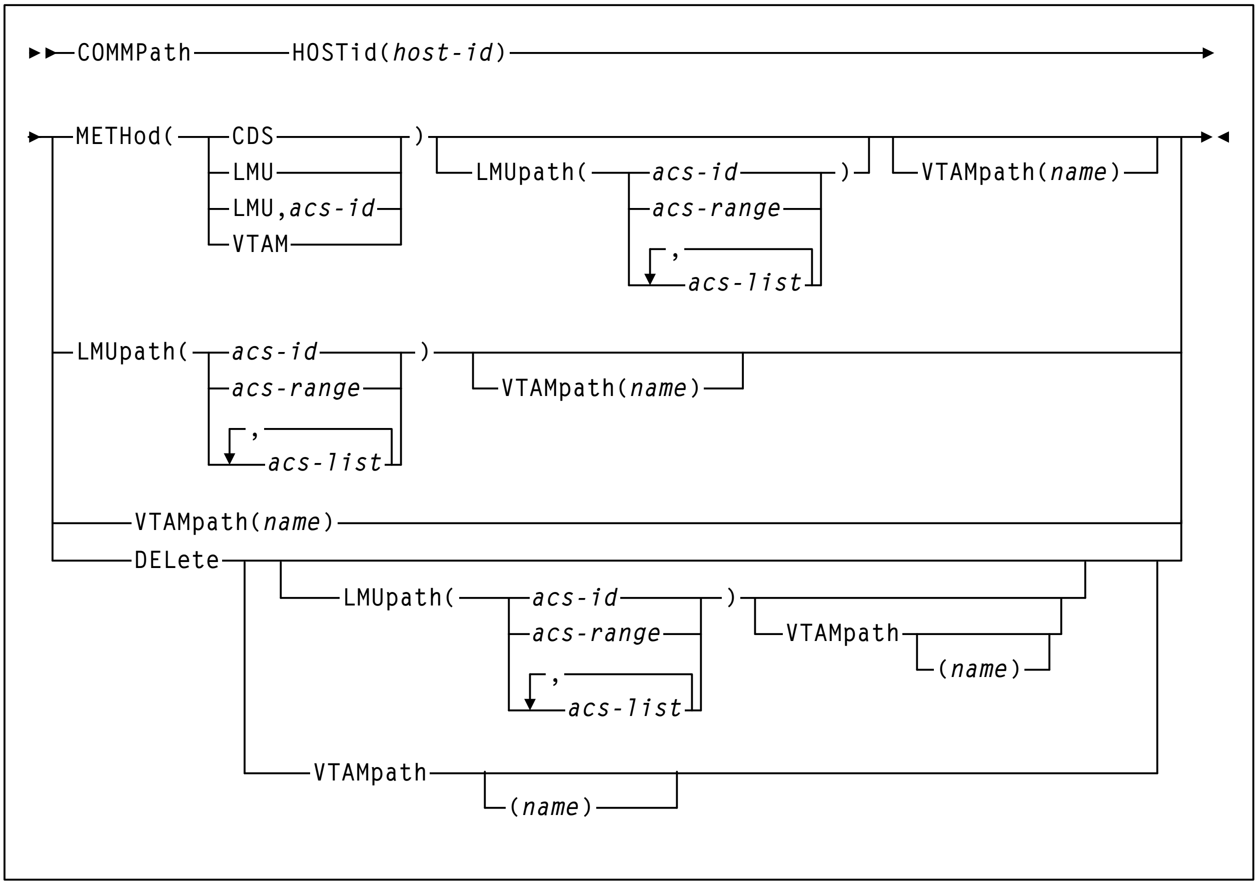
- set up a tiered communication service between HSC hosts which can be modified at any time without bringing down the HSC
- define the hierarchy of methods available to each host for communicating with other hosts
- establish the current method of communications for a host (or switch from one method to another).

It is recommended that host-to-host communications be defined in PARMLIB at startup. The COMMPath command is best used to switch communications paths or to delete paths.

Notes:

- **Oracle strongly recommends the use of VTAM host-to-host communications, since a VTAM network does not place a performance burden on HSC components or the library.** Refer to “Set High-performance Host-to-Host Communications” in the *HSC System Programmer’s Guide* for more information.
- On each host, the COMMPath command must be executed once to define communications for the issuing host and once for each attached host. That is, for a three-host system, the command must be executed three times on each host.
- After the HSC initiates an automatic downward switch, an upward switch can only be accomplished by executing the COMMPath command.
- Use the Display COMMPath command to display the current settings for HSC host-to-host communications. Refer to “Display COMMPath” on page 75 for details on command syntax and parameters.

Syntax



Command Name

COMMPath
initiates the COMMPath command or control statement.

Parameters

HOSTid
specifies the host for which the command sets or modifies the parameters.

host-id
is the host identifier.

METHod

specifies the current method of communications to be used for the specified host. This parameter allows switching to a higher, lower, or equivalent (for LMUpath only) level method of communications.

CDS

indicates that communications is to be through the control data set.

Note: CDS is the initial setting for HSC host-to-host communications.

LMU

indicates that communications is to be through an LMU.

Notes:

- If LMU is specified, the LMUpath parameter must have been specified in a previous command, or it must be included in the same command.
- If the LMU method is specified in PARMLIB, the switch from CDS to LMU is delayed until the HSC initializes to the full service level.
- If the HSC service level drops to base, LMU communications are switched to CDS. When the full service level is restored, an upward switch to the LMU method can only be accomplished by issuing the COMMPath command.

acs-id

specifies the LMUpath definition that is to be the active (or current) LMUpath. If you do not supply an acs-id, the first LMUpath specified in the list of LMUpath definitions is made active.

VTAM

specifies that communications is to be through a VTAM network.

Notes:

- If VTAM is specified, the VTAMpath parameter must have been specified in a previous command, or it must be included in the same command.
- A downward switch from the VTAM method is performed when the VTAM APPLID of the HSC is varied inactive, or VTAM is shut down, or the GCS communications server terminates.

LMUpath

specifies one or more LMUpaths that can be used for host-to-host communications. An LMU is eligible to be used for host-to-host communications if it is connected to other HSCs sharing a library.

If more than one eligible LMU is specified, the HSC begins searching for an available communications path beginning with the first *acs-id* in the list. The search continues until a path can be established or the end of the list is reached.

The LMUpath definitions are cumulative; that is, the definitions specified in a command are appended to the current list of definitions. You can insert an LMUpath into the current list by specifying the LMUpath that you wish to insert, followed by the LMUpaths that are to come after it. If a COMMPath command specifies an LMUpath that is already defined in the list, the path is removed from its current position and appended to the end of the list as specified in the command.

For example, the current definition is (02,03,04). You can insert LMUpath 01 after 02 by specifying LMU(01,03,04). Now the current list appears as (02,01,03,04). Also, if the current definition is (02,01,03,04) and the command specifies LMU(01,02), the list becomes (03,04,01,02).

Note: For a temporary outage of an LMU, it is not necessary but may be desirable to delete the LMUpath definition for that LMU. When the LMU is available again, define it to the communications service again by adding it to the current definitions.

acs-id or acs-range or acs-list

identifies one or more specific LMUs. Each acs-list element can be either a single ACSid or an ACSid range. The elements in a list must be separated by a comma or a blank, and the entire list must be enclosed in parentheses.

VTAMpath

defines the VTAM name to be associated with an HSC host. The VTAM name is used in the process of establishing a VTAM connection with other HSCs. It is the VTAM APPLID defined by the VTAM APPL statement.

This parameter can also be used to change or delete a previously defined name, but only when the current method for this host is not VTAM.

name

is the VTAM name.

DELete

specifies to delete the definitions specified by the LMUpath parameter and/or the VTAMpath parameter.

If LMU is not the current method, all LMUpath definitions can be deleted by specifying DELete LMUpath (without supplying an acs-id). If the current method is LMU, the active LMUpath cannot be deleted.

If the current method is VTAM, the VTAMpath definition cannot be deleted.

Examples

The following examples illustrate the use of the COMMPath command and control statement.

Define VTAM Method and VTAMpath

The following example defines VTAM as the communications method for host HSC1 and defines the path (VTAM APHSC1) to use.

```
COMMPATH HOSTID(HSC1),METHOD(VTAM),VTAMPATH(APHSC1)
```

Define LMU Method and LMUpath List

The following example defines LMU as the communications method for host HSC2 and specifies an ordered list of eligible LMUs.

```
COMMP HOSTID(HSC2),METHOD(LMU),LMUPATH(01,00,02-04)
```

The LMUpath parameter defines the search order for automatic switching of LMUpaths if an error occurs. First try the LMU connected to ACS 01. Then try 00. If necessary, try 02, 03, and 04 respectively.

Define VTAM Method and VTAMpath, and Specify LMUpaths

The following example defines VTAM as the communications method for host HSC2, specifies the path (VTAM APHSC2) to use, and supplies an ordered list of eligible LMU paths.

```
COMMP HOSTID(HSC2),METHOD(VTAM),VTAMPATH(APHSC2),LMU(01,00,02-04)
```

Switch to LMU Communications Using LMU 00

Issue the following command on host HSC1 to switch host HSC1 from CDS communications to LMU communications and specify which LMU to use.

```
COMMP HOST(HSC1),METHOD(LMU,00)
```

Delete All Defined LMUpaths for HSC2

Issue the following command to delete all LMUpath definitions for host HSC2.

```
COMMP HOST(HSC2),DEL,LMUPATH
```

Figure 2 illustrates a tiered communications service in a three host configuration.

Note: In the examples below, hosts HSC0 and HSC1 have no defined communications paths in common; therefore, they communicate using the CDS.

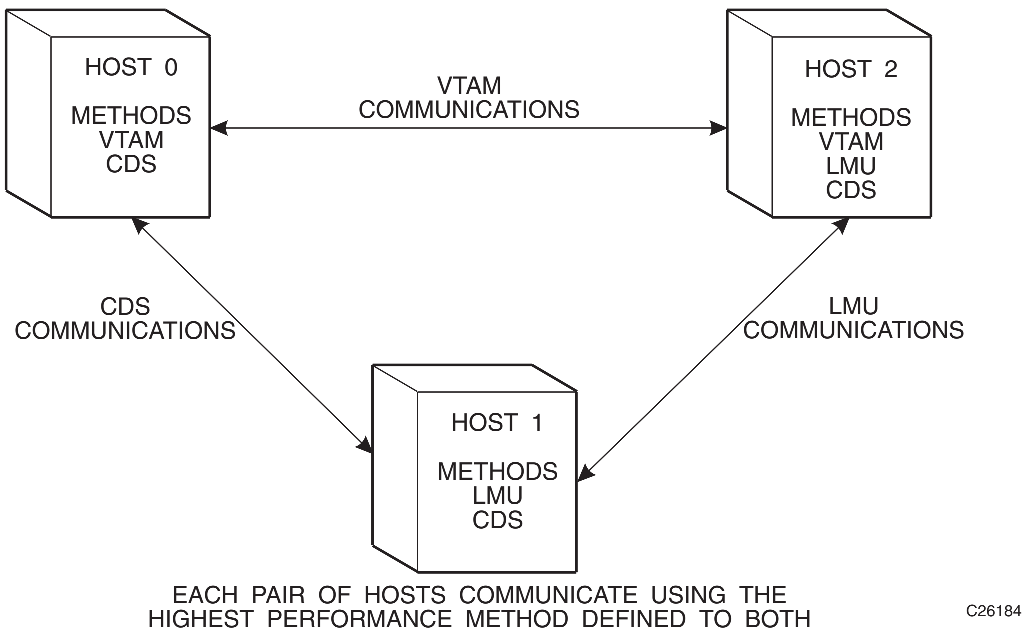


Figure 2. HSC Communication Methods Between Multiple Hosts

Using PARMLIB to Define Host-to-Host Communications

This example shows how the communications service in Figure 2 would be defined in PARMLIB.

```
COMMPATH HOSTID(HSCØ) METHOD(VTAM),VTAMPATH(APHSCØ)
COMMPATH HOSTID(HSC1) METHOD(LMU),LMUPATH(ØØ)
COMMPATH HOSTID(HSC2) METHOD(VTAM),LMUPATH(ØØ),VTAMPATH(APHSC2)
```

Note: Each host reads PARMLIB and executes all three commands during startup. If the HOSTid in the command is the executing host, the METHod parameter is acted on; otherwise, it is ignored.

Using Operator Commands to Define Host-to-Host Communications

Issue the following commands from host HSC0:

```
COMMPATH HOSTID(HSC0) METHOD(VTAM),VTAMPATH(APHSC0)
COMMPATH HOSTID(HSC1) LMUPATH(00)
COMMPATH HOSTID(HSC2) LMUPATH(00),VTAMPATH(APHSC2)
```

Issue the following commands from host HSC1:

```
COMMPATH HOSTID(HSC1) METHOD(LMU),LMUPATH(00)
COMMPATH HOSTID(HSC0) VTAMPATH(APHSC0)
COMMPATH HOSTID(HSC2) LMUPATH(00),VTAMPATH(APHSC2)
```

Issue the following commands from host HSC2:

```
COMMPATH HOSTID(HSC2)METHOD(VTAM),LMUPATH(00),VTAMPATH(APHSC2)
COMMPATH HOSTID(HSC0) VTAMPATH(APHSC0)
COMMPATH HOSTID(HSC1) LMUPATH(00)
```

Note: In the examples above, hosts HSC0 and HSC1 have no defined communications paths in common; therefore, they communicate using the CDS.

DISMOUNT Command

The DISMount command directs the LSM robot to dismount a cartridge. Although the volume may be rewound and unloaded by the operating system, it may not be dismounted from the library transport. This command is provided in case some hosts are not communicating (disconnected) with a specific ACS (see “Disconnected Mode” on page 12 for an explanation of disconnected mode).

Hosts that are still communicating (connected mode) may be able to semi-automate tape handling for hosts that cannot communicate with a specific ACS. When the HSC does not dismount a volume, you must make sure that the volume is unloaded before you issue the DISMount command.

Syntax

```
►►─DISMount──────┬─,─────────────┬─devaddr──┬──────────────┬───────────────────────►◄
                 └─volser────────┘          └─host-id──────┘
```

Command Name

DISMount
initiates the DISMount command.

Parameters

volser
specifies which volume to dismount. The volser operand is optional. If it is not specified, the robot dismounts whatever volume is mounted on the device.

If volser is not specified, a comma must be entered immediately before the device address to indicate the missing operand. For example:

```
DISMOUNT ,BØØ
```

devaddr
specifies the device address of the transport from which the volume is to be dismounted.

host-id
indicates that the DISMount command is to be performed for the device address of the specified host (specified by the HOSTID parameter in SYSPROF).

Examples

The following examples illustrate the use of the DISMount command.

Dismount VOLSER 110017 From Transport Address 18F for This Host

```
DISMOUNT 110017 18F
```

Dismount VOLSER 111222 From Transport Address B04 for Host HSC2

```
DISM 111222 B04 HSC2
```

DISPLAY Command

The Display command is used to obtain status information about various components of the library. A console message presents a formatted, multiple-line display of status information for the specified component. If the Display command is issued with no parameters, the current software level and service level are displayed.

Some Display parameters are supported by the UUI interface, which provides plain text, structured XML, and comma separated values (CSV) output formats. See the *NCS/VTCS XML Guide* for a list of Display parameters.

Note: Display command parameters are described individually in the sections that follow.

Display Identifiers

The DRives, SCRatch, and THReshld parameters can display media types and recording techniques. When multiple MEDia or RECtech values are displayed, and cannot fit within the field provided for them, they are abbreviated as shown in Table 3 and Table 4.

Table 3. MEDia Display IDs

Media Type:	Display ID:
Standard	1
ECART	E
DD3A	A
DD3B	B
DD3C	C
DD3D	D
STK1R	R
STK1U	U
ZCART	Z
NONE	*
STK2P	P
STK2W	W
T10000T1	1T
T10000TS	ST
T10000CT	TC
T10000T2	2T
T10000TT	TT
T10000CL	LC

Table 4. RECtech Display IDs

Recording Technique:	Display ID:
18track	1
36Atrack	2
36Btrack	3
36track	4
LONGItud	5
DD3	6
STK1RA	F
STK1RA34	G
STK1RA35	H
STK1R35	7
STK1R34	8
STK1RB	E
STK1RB34	C
STK1RB35	D
STK1RAB	16
STK1RAB4	14
STK1RAB5	15
STK1RC	10
STK1RC34	11
STK1RC35	12
36Ctrack	9
STK1R	R
IGNORE	*
STK2P	P
STK2P34	A
STK2P35	B
STK2PA	13
STK2PA34	O
STK2PA35	Q

Table 4. RECtech Display IDs

Recording Technique:	Display ID:
STK2PB	L
STK2PB34	M
STK2PB35	N

In a display of media types, for example, multiple values may be shown as

```
1+A+B
```

which indicates that Standard, DD3A, and DD3B recording techniques are being represented.

If multiple MEDia or RECtech values are specified, only the last value is used. In the following example, only MEDIA(DD3) is processed.

```
DISPLAY THRESHLD MEDIA(STD) MEDIA(ECART) MEDIA(DD3)
```

Display Example

The following example illustrates the use of the Display command default and provides sample output.

```
DISPLAY
```

Sample Output

```
... HSC SERVICE LEVEL FULL ACTIVE
... DATA BASE STATUS:  xxx
```

Note: In the previous sample, *xxx* is the unique message sequence number assigned to multiple-line messages. This number appears in the left column of all subsequent lines of the message.

Display Acs

Syntax

```
►►─Display──Acs─┬─────────────────────┬──────────────────►◄
                ├─acs-id──────────────┤
                ├─acs-range───────────┤
                │      ┌─,──────────┐ │
                └─(────▼─acs-list───┴─)┘
```

Parameters

Acs

displays the status of one or more ACSs. ACS status includes:

- partition ID
- online/offline status of all stations
- connected/disconnected status of all ACSs
- number of outstanding responses owed to the HSC by the LMU
- number of temporary outage queue elements
- the number of free storage cells and scratch volumes available in the ACS
- HSC/LMU compatibility leve
- redundant electronics connections (summary of all Library Controllers).

Note: The number of free storage cells is not accurate until the LSM(s) is varied online. Refer to “VARY Station Command” on page 226 for syntax information.

acs-id or ***acs-range*** or ***acs-list***

identifies one or more ACSs for which the system is to display status. Each *acs-list* element can be either a single ACSid or an ACSid range. The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

If you do not supply an *acs-id*, the status of all defined ACSs in the library is displayed.

Example

The following example illustrates the use of the Display Acs command and provides sample output.

Display the Status of ACSs 00 and 01:

```
Display ACS 00

Sample Output

... ACS 00 STATUS: CONNECTED xxx
Partition ID=000
Compatibility levels: HSC=23, LMU=23
Redundant Electronics Configured
Scratch Volumes available......          0
Free Cells available...........       2583
RE Library Summary:
LIB LC Mode    Status           IP Addr/Host Name
1   A  standby                  10.80.46.170
1   B  active  Online           10.80.46.171
2   A  active                   not assigned
2   B  standby                  not assigned
3   A  active                   not assigned
3   B  standby                  not assigned
4   A  active                   not assigned
4   B  standby                  not assigned
```

Display ALl

Syntax

```
►►─Display───ALl──────────────────────────────────────────────────────────►◄
```

Parameters

ALl
displays the status of the control data set and a status summary of each ACS.

Example

The following example illustrates the use of the Display ALl command and provides sample output.

Display ALI

```
D AL
```

Sample Output

```
... HSC SERVICE LEVEL FULL ACTIVE
... DATA BASE STATUS: xxx
DATASET CONFIGURED CURRENT
PRIMARY ....... ONLINE ONLINE
SECONDARY ..... ONLINE ONLINE
STANDBY ....... OFFLINE OFFLINE
JOURNAL........ ONLINE ONLINE
... ACS ØØ STATUS: CONNECTED xxx
COMPATIBILITY LEVELS: HSC=1Ø, LMU=Ø5
DUAL LMU IS CONFIGURED
MASTER IS A; STANDBY IS READY
STATION ØØCC ONLINE
STATION ØØCD OFFLINE
STATION Ø5E8 STANDBY
STATION Ø5E9 OFFLINE
SCRATCH VOLUMES AVAILABLE......       52
FREE CELLS AVAILABLE...........      317
... LSM ØØ:ØØ STATUS: xxx
ONLINE       - READY             - AUTOMATIC
... LSM ØØ:Ø1 STATUS: xxx
ONLINE       - READY             - AUTOMATIC
... ACS Ø1 STATUS: CONNECTED xxx
COMPATIBILITY LEVELS: HSC=1Ø, LMU=Ø5
DUAL LMU NOT CONFIGURED
STATION ØØDØ ONLINE
STATION ØØD1 OFFLINE
SCRATCH VOLUMES AVAILABLE......      167
FREE CELLS AVAILABLE...........      756
... LSM Ø1:Ø1 STATUS: xxx
ONLINE            - READY        - AUTOMATIC
```

Display Cap

Syntax

```
           ┌(all CAPs)┐
►►─Display─Cap─┼──────────┼──────────────────────────────────►◄
           ├─acs-id───┤
           ├─lsm-id───┤
           └─cap-id───┘
```

Parameters

Cap

displays CAP activity for one or more CAPs online to this host. The output display contains the following information:

- CAPid
- CAP size: PCAP (priority CAP); 21-cell or 14-cell 9740 (standard CAP); 40-cell (enhanced CAP); 20-cell (9360 CAP); 30-cell (9360 optional CAP); 26-cell (SL3000 CAP); or 39-cell (SL8500 CAP).
- Partition ID
- Host ID of the host owning the CAP
- Priority: CAP preference value
- CAP mode: cleaning, draining, ejecting, entering, or idle
- CAP status: active, automatic mode, manual mode, offline, online, and/or recovery needed.

Note: If the CAP status indicates RECOVERY, refer to "How to Clear Recovery Status on a CAP" on page 352 for instructions on clearing this condition.

all CAPs

displays all CAP activity for all ACSs online to this host.

acs-id

displays all CAP activity for a specified ACS.

lsm-id

displays all CAP activity for a specified LSM.

cap-id

displays all CAP activity for a specified CAP.

Notes:

- The *acsid*, *lsmid*, and *capid* parameters are positional operands. If no positional operand is specified, the default operation is to display the status of all CAP activity for all ACSs.
- The *acsid*, *lsmid*, and *capid* may be expressed as a list.

Example

The following examples illustrate the use of the Display Cap command and provide sample output.

In these examples, LSM 00:00 is defined as a standard CAP; LSM 00:01 a Clipper CAP; and LSM 01:00 an optional WolfCreek door with a 20-cell CAP, a 30-cell CAP, and a PCAP.

Display CAP Status

```
D CAP

Sample Output

... CAP STATUS: xxx
CAP ID    SIZE     HOSTID    PRIORITY    MODE      STATUS
------------------------------------------------------------
00:00:00  21-CELL  NONE      00          IDLE      MANUAL
                                                   ONLINE
00:01:00  40-CELL  HSC1      09          ENTERING  ACTIVE
                                                   MANUAL
                                                   ONLINE
00:01:01  40-CELL  NONE      08          IDLE      ACTIVE
                                                   MANUAL
                                                   ONLINE
00:01:02  PCAP     NONE      00          IDLE      AUTOMATIC
                                                   ONLINE
01:00:00  20-CELL  HSC3      09          EJECTING  ACTIVE
                                                   MANUAL
                                                   ONLINE
01:00:01  30-CELL  NONE      08          IDLE      MANUAL
                                                   ONLINE
01:00:02  PCAP     NONE      00          IDLE      AUTOMATIC
                                                   ONLINE
01:01:00  21-CELL  NONE      00          IDLE      MANUAL
                                                   ONLINE
```

Display CAP Status Using LSMid

```
D CAP 00:01

Sample Output

... CAP STATUS: xxx

CAP ID    SIZE     HOSTID     PRIORITY     MODE      STATUS
---------------------------------------------------------------------
00:01:00  40-CELL  HSC1       09           ENTERING  ACTIVE
                                                     MANUAL
                                                     ONLINE
00:01:01  40-CELL  NONE       08           IDLE      ACTIVE
                                                     MANUAL
                                                     ONLINE
00:01:02  PCAP     NONE       00           IDLE      AUTOMATIC
                                                     ONLINE
```

Display CAP Status Using CAPid

```
D CAP 00:01:00

Sample Output

... CAP STATUS: xxx

CAP ID     SIZE     HOSTID    PRIORITY     MODE      STATUS
---------------------------------------------------------------------
00:01:00   40-CELL  HSC1      09           ENTERING  ACTIVE
                                                     MANUAL
                                                     ONLINE
```

Display CAP Status Using LSMid List

```
D CAP (00:00,00:01)

Sample Output

... CAP STATUS: xxx

CAP ID     SIZE     HOSTID    PRIORITY     MODE      STATUS
---------------------------------------------------------------------
00:00      21-CELL  NONE      00           IDLE      MANUAL
                                                     ONLINE
00:01:00   40-CELL  HSC1      09           ENTERING  ACTIVE
                                                     MANUAL
                                                     ONLINE
00:01:02   PCAP     NONE      00           IDLE      AUTOMATIC
                                                     ONLINE
```

Display CDS

Syntax

```
►►─Display───CDS──────────────────────────────────────────────────────►◄
```

Parameters

CDS
displays the status of all copies of the control data set, the journals (if allocated), and the attached hosts. Output is dependent upon LIBGEN-specified recovery techniques, and the number of hosts that are identified to the library from the LIBGEN.

Example

The following example illustrates the use of the Display CDS command and provides sample output:

Display Control Data Set Status

```
D CDS

Sample Output

... DATABASE INFORMATION xxx

DBASEPRM = SLS.HSCX.DBASEPRM
  PRIVOL = CIM001     FLAGS(40) ACTIVE
DBASESEC = SLS.HSCX.DBASESEC
  SECVOL = CIM002     FLAGS(40) ACTIVE

JOURNAL1 = SLS.HSC1.JOURNAL1
  JRNVOL = CIM001 - CURRENT      5% FULL
JOURNAL2 = SLS.HSC1.JOURNAL2
  JRNVOL = CIM002
JOURNAL RECOVERY = (80) ABEND

ENQNAME  = STKALSQN       - SMFTYPE = 245
CLEAN PREFIX = CLN        - LABTYPE = (00) SL
RECOVERY = (03) BOTH      - DELETE DISP = (00) SCRATCH
THIS HOST IS -   HSC1

HOSTID---LEVEL-FLAG---DESCRIPTION---
HSC1     2.0.0 (E0)   ACTIVE PRIMARY SECONDARY
HSC2     2.0.0 (E0)   ACTIVE PRIMARY SECONDARY
HSC3     1.2.0 (00)   -INACTIVE-

DATABASE INFORMATION END
```

Display CMd

Syntax

```
►►─Display──┬─CMd─────┬──command-name──────────────────────────────►◄
            └─COmmand─┘
```

Parameters

CMd or **COmmand**
: displays syntax and usage information for a specified HSC operator command.

command-name
: specifies the desired command name. The HSC checks only the first six characters; any characters after the first six are ignored.

  You must specify the entire command name for commands containing six characters or less. Command names containing more than six characters may optionally be abbreviated to the first six characters.

Example

The following example illustrates the use of the Display CMd command and provides sample output.

Display Information About the HSC Mount Command

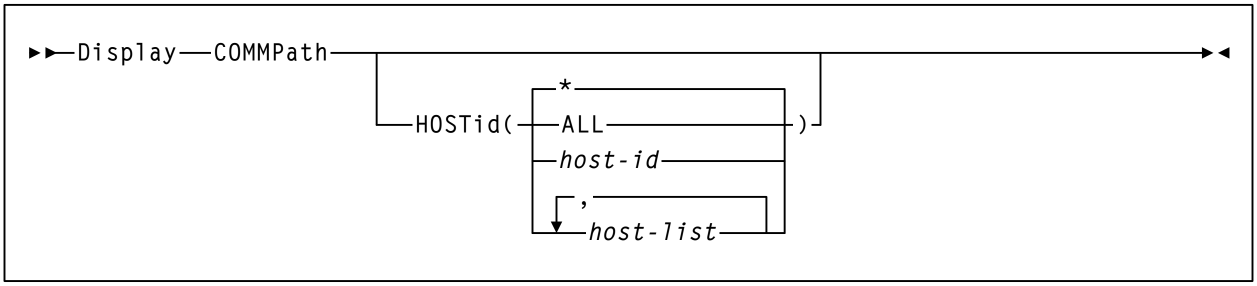
```
DISPLAY CMD MOUNT

Sample Output

... COMMAND MOUNT HELP INFO: xxx
THE LIBRARY MOUNT COMMAND DIRECTS THE ROBOT TO MOUNT A
VOLUME ONTO A LIBRARY CONTROLLED TRANSPORT.
AUTOMATIC VOLUME RECOGNITION (AVR) RECOGNIZES THAT THE
VOLUME IS PREMOUNTED IF A JOB REQUESTS THAT VOLUME.
IN MVS, THE VOLUME IS NOT MARKED AS PERMANENTLY MOUNTED
(I.E. MVS READILY DISMOUNTS THE VOLUME). IN ORDER TO MAKE
THE VOLUME PERMANENTLY RESIDENT, THE OPERATOR MUST ISSUE THE
MVS MOUNT COMMAND.
IN VM, THE NATIVE TAPE LIBRARY MANAGEMENT SYSTEM MUST
PROCESS ITS OWN MOUNT COMMAND.
+-------------------------------------------+
| -MOUNT [VOLSER|SCRTCH|PRIVAT] DEVADDR     |
|        { HOST-ID } { READONLY }           |
|        { SUBPOOL(SUBPOOL-NAME) }          |
+-------------------------------------------+
MOUNT      INITIATES THE MOUNT COMMAND.
VOLSER     SPECIFIES THE VOLUME TO BE MOUNTED.
SCRTCH     SPECIFIES A SCRATCH VOLUME IS TO BE MOUNTED.
PRIVAT     SPECIFIES A SCRATCH VOLUME IS TO BE MOUNTED.
SUBPOOL    INDICATED THAT THE SCRATCH VOLUME IS TO BE TAKEN
           FROM A SCRATCH SUBPOOL.
SUBPOOL-NAME SPECIFIES THE SUBPOOL FROM WHICH THE SCRATCH
           VOLUME IS TO BE TAKEN.
DEVADDR SPECIFIES THE DEVICE ADDRESS OF THE TRANSPORT ON
           WHICH TO MOUNT THE VOLUME.
HOST-ID INDICATES THAT THE MOUNT COMMAND IS TO BE
           PERFORMED FOR THE DEVICE ADDRESS OF THE HOST
           SPECIFIED.
READONLY   INDICATES THAT THE TAPE IS TO BE MOUNTED FOR
           READ-ONLY ACCESS.
```

Display COMMPath

Syntax



Parameters

COMMPath
displays the current settings for HSC host-to-host communications. If the HOSTid parameter is not specified, a message displays a summary of the parameter settings for all hosts.

HOSTid
indicates that you want to obtain information about specific hosts.

ALL
displays the settings for all defined hosts. Depending on the number of hosts in your environment, the display can be extremely long.

host-id or ***host-list***
identifies the host or hosts about which you want information. The HSC issues console messages that display the current settings for each specified host.

The elements in a *host-list* must be separated by commas or blanks, and the entire list must be enclosed in parentheses. Ranges are not valid.

*****
displays the settings for the host on which you enter the command. This is the default if HOSTid is specified without a value.

Example

The following example illustrates the use of the Display COMMPath command and provides sample output.

Display Summary of Host-to-Host Communications

```
D COMMP

Sample Output

... CURRENT HSC HOST-TO-HOST  xxx
  HOSTID   METHOD  METHLIM  VTAMNAME  LMUPATH
>>HSC1             CDS      AF1SLSØ
  HSC2     CDS     CDS      AF2SLSØ
  HSC3     CDS     CDS
```

In the sample output above, the ‘‘>>’’ indicates the host issuing the command.

METHOD is the method currently being used for host-to-host communications with the other host.

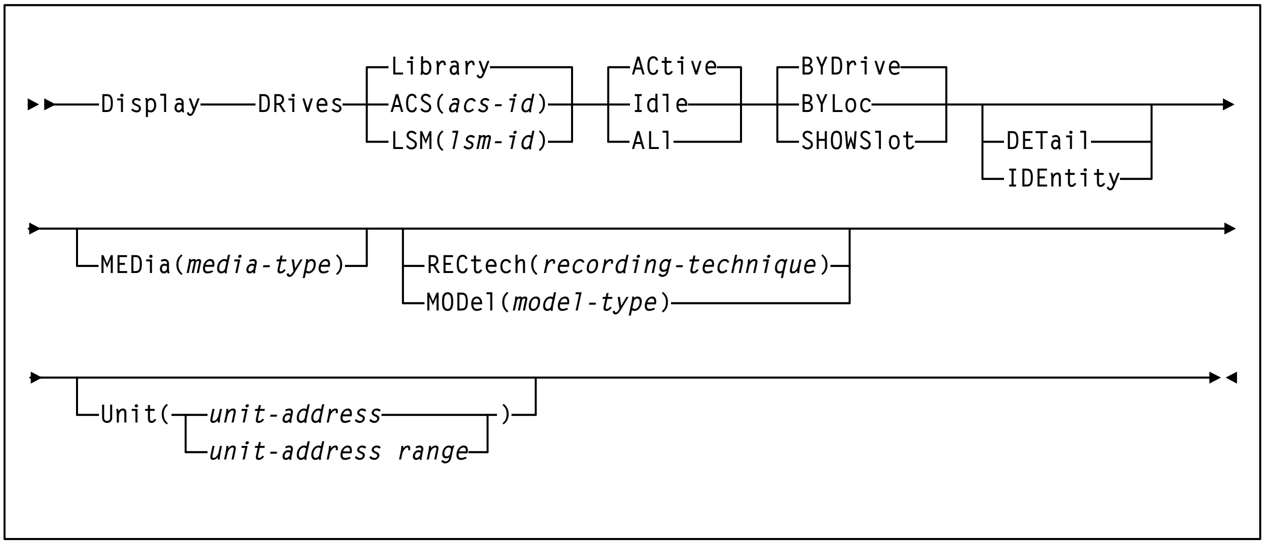
METHLIM is the upper limit used for host-to-host communications at that host. This is specified by the METHod parameter of the COMMPath command and control statement.

VTAMNAME is the VTAM name, if it is specified by the VTAMpath parameter of the COMMPath command and control statement.

LMUPATH is the ACS ID, if it is specified by the LMUpath parameter of the COMMPath command and control statement.

Display DRives

Syntax



Parameters

DRives
displays current and queued mount activity for each transport address for the host issuing the command. This parameter derives its information from HSC internal control blocks containing actions requested of the LMU (mounting, mnt scr, dismount, swapping, errant, ejecting, entering, cleaning).

Library
only library-controlled drives are processed.

ACS
only drives in a specified ACS are processed.

acs-id
identifies the ACS for which the system is to display drive information.

LSM
only drives in a specified LSM are processed.

lsm-id
identifies the LSM for which the system is to display drive information.

ACtive
only active drives are processed.

Idle
only idle drives are processed (includes drives that may be offline).

ALl
all drives are processed regardless of status.

BYDrive
displays the drives by host device address. This is the default.

BYLoc
displays the drives by library location.

SHOWSlot
optionally, displays the drives by host device address, and displays the drive bay location (slot) for drives in SL3000 and SL8500 libraries.

DETail
optionally, displays the requested status and the drive media types and recording techniques.

IDEntity
optionally, displays the World Wide Name transport identifier and the transport serial number.

MEDia
optionally, limits the display of drives only to those that support the specified type of media. The default is for all types of media.

Notes:

- If **MEDia** is not specified, the drive is selected without regard to media type.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type
identifies the media type. Valid media types are:

LONGItud
indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive. ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, DD3C, or DD3D cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C, DD3D

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, C, or D). DD3A, DD3B, DD3C, or DD3D can be abbreviated to A, B, C, or D, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB
- D — cleaning cartridge.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R
: indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B), 40GB (T9840C), or 75GB (T9840D).

STK1U
: indicates a T9840 cleaning cartridge. STK1U can be abbreviated to U.

STK1Y
: indicates a T9840D cleaning cartridge. STK1Y can be abbreviated to Y.

STK2
: indicates any T9940 cartridge.

STK2P, STK2W
: indicates a T9940 cartridge. The media indicator in the external label is encoded with the cartridge type (P or W). STK2P or STK2W can be abbreviated to P or W, respectively.

Types of T9940 cartridges, along with their associated media capacities, are:

- STK2P — 60GB (T9940A) or 200GB (T9940B)
- STK2W — cleaning cartridge.

T10000T1 or **T1**
: indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. **T10000T1** can be abbreviated as **T1**.

T10000TS or **TS**
: indicates a smaller-capacity 120GB T10000A or 240GB T10000B cartridge. **T10000TS** can be abbreviated as **TS**.

T10000CT or **CT**
: indicates a T10000 cleaning cartridge. **T10000CT** can be abbreviated as **CT**.

T10000T2 or **T2**
: indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**
: indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

T10000CL or **CL**
: indicates a T10000A, T10000B, or T10000C cleaning cartridge. T10000CL can be abbreviated as **CL**.

RECtech

optionally, limits the display of drives only to those that support the specified recording technique. The default is for all recording techniques. RECtech refers to the method used to record data tracks on the tape surface.

If RECtech is not specified, the drive is selected without regard to recording technique.

Notes:

- RECtech and MODel are mutually exclusive.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

recording-technique

displays drives for the specified recording technique. Valid recording techniques are:

LONGItud

indicates any device that uses longitudinal recording.

18track

indicates a 4480 transport.

36track

indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack

indicates a 4490 (Silverton) transport.

36Btrack

indicates a 9490 (Timberline) transport.

36Ctrack

indicates a 9490EE transport.

HELical

indicates a device using helical recording.

DD3

indicates a device using helical recording.

STK1R

indicates any 9840 transport.

STK1R34
indicates any 3490E-image 9840 transport.

STK1R35
indicates any 3590-image 9840 transport.

STK1RA
indicates a 3490E or 3590-image T9840A transport.

STK1RA34
indicates a 3490E-image T9840A transport.

STK1RA35
indicates a 3590-image T9840A transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK1RAB
indicates a 3490E or 3590-image T9840A or T9840B transport.

STK1RAB4
indicates a 3490E-image T9840A or T9840B transport.

STK1RAB5
indicates a 3590E-image T9840A or T9840B transport.

STK1RC
indicates a 3490E or 3590-image T9840C transport.

STK1RC34
indicates a 3490-image T9840C transport.

STK1RC35
indicates a 3590-image T9840C transport.

STK1RD
indicates any T9840D transport.

STK1RDE
indicates an encryption-enabled T9840D transport.

STK1RDN
indicates a non-encryption enabled T9840D transport.

STK1RD34
indicates a non-encryption enabled 3490E-image T9840D transport.

STK1RD35
indicates a non-encryption enabled 3590-image T9840D transport.

STK1RDE4
indicates an encryption-enabled 3490E-image T9840D transport.

STK1RDE5
indicates an encryption-enabled 3590-image T9840D transport.

STK2P
indicates any 9940 transport.

STK2P34
indicates any 3490E-image 9940 transport.

STK2P35
indicates any 3590-image 9940 transport.

STK2PA
indicates a T9940A transport.

STK2PA34
indicates a 3490E-image T9940A transport.

STK2PA35
indicates a 3590-image T9940A transport.

STK2PB
indicates a T9940B transport.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The T10000 parameters in the table below have changed. The old parameter names are being phased out and may be removed in a future product release.

Old Parameter Name:	New Parameter Name:
T1A	T10KA
T1AE	T10KAE
T1AN	T10KAN
T1B	T10KB
T1BE	T10KBE
T1BN	T10KBN

T10K
indicates all T10000 transports.

T10KN
indicates all non-encrypted T10000 transports.

T10KE
indicates all encrypted T10000 transports.

T10KA
indicates any T10000A transport.

T10KAN
indicates a non-encryption enabled 3490E- or 3590-image T10000A transport.

T1A34
indicates a non-encryption enabled 3490E-image T10000A transport.

T1A35
indicates a non-encryption enabled 3590-image T10000A transport.

T10KAE
indicates an encryption-enabled 3490E- or 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T10KB
indicates any T10000B transport.

T10KBN
indicates a non-encryption enabled 3490E- or 3590-image T10000B transport.

T1B34
indicates a non-encryption enabled 3490E-image T10000B transport.

T1B35
indicates a non-encryption enabled 3590-image T10000B transport.

T10KBE
indicates an encryption-enabled 3490E- or 3590-image T10000B transport.

T1BE34
indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35
indicates an encryption-enabled 3590-image T10000B transport.

T10KC
indicates any T10000C transport.

T10KCN
indicates a non-encryption enabled 3490E- or 3590-image T10000C transport.

T1C34
indicates a non-encryption enabled 3490E-image T10000C transport.

T1C35
indicates a non-encryption enabled 3590-image T10000C transport.

T10KCE
indicates an encryption-enabled 3490E- or 3590-image T10000C transport.

T1CE34
indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
indicates an encryption-enabled 3590-image T10000C transport.

IGNORE
indicates a nonexistent physical transport.

MODel

optionally, specifies the model number of a tape transport. MODel provides the same type of information as RECtech, but a user may find it more convenient to specify a transport model than a recording technique. If MODel is not specified, drives are selected without regard to model number.

Note: MODel and RECtech are mutually exclusive.

model-type

identifies the model type. Valid model types are:

4480
indicates a 4480 (18-track) transport.

4490
indicates a 4490 (36-track Silverton) transport.

9490
indicates a 9490 (36-track Timberline) transport.

9490EE
indicates a 9490EE (36-track Timberline EE) transport.

SD3
indicates an SD-3 (RedWood) transport.

9840
indicates a 3490E-image 9840 transport.

984035
indicates a 3590-image 9840 transport.

T9840B
indicates a 3490E-image T9840B transport.

T9840B35
indicates a 3590-image T9840B transport.

T9840C
indicates a 3490E-image T9840C transport.

T9840C35
indicates a 3590-image T9840C transport.

T9840D
indicates a non-encryption enabled 3490E-image T9840D transport.

T9840D35
indicates a non-encryption enabled 3590-image T9840D transport.

T9840DE
indicates an encryption-enabled 3490E-image T9840D transport.

T9940A
indicates a 3490E-image T9940A transport.

T9940A35
indicates a 3590-image T9940A transport.

T9940B
indicates a 3490E-image T9940B transport.

T9940B35
indicates a 3590-image T9940B transport.

T1A34
indicates a 3490E-image T10000A transport.

T1A35
indicates a 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T1B34
indicates a 3490E-image T10000B transport.

T1B35
indicates a 3590-image T10000B transport.

T1BE34
indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35
indicates an encryption-enabled 3590-image T10000B transport.

T1C34
indicates a 3490E-image T10000C transport.

T1C35
indicates a 3590-image T10000C transport.

T1CE34
indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
indicates an encryption-enabled 3590-image T10000C transport.

IGNORE
indicates a nonexistent physical transport.

Unit

optionally, limits the display of drives to a unit address or a range of unit addresses.

unit-address* or *unit-address range

indicates a single unit address or a range of addresses.

Examples

The following examples illustrate the use of the Display DRives command and provide sample output.

Display Mount Activity for Each Transport Address

```
DISPLAY DRIVES
```

Sample Output

```
SLS2916I Drive ØC14 PGØØ45 Mounting
SLS2916I Drive ØC15 PGØØ46 Mounting
SLS2916I Drive ØC16 PGØØ43 Dismount
SLS2916I Drive ØC17 PGØØ44 On drive
SLS2916I Drive ØC12 1Ø569Ø On drive
SLS2914I Display of drives complete.
```

Display Detailed Drive Information by Host Device Address

```
D DR ALL DETAIL
```

Sample output

```
DRIVE LOCATION      VOLSER STATUS   MODEL   MEDIA

0A60  01:00:10:07   VOL003 Dismount 4480    STANDARD
0A8C  00:00:01:00   VOL001 Mounting 4480    STANDARD
0A8D  00:00:01:01          Offline  4480    STANDARD
0A8E  00:00:01:02          Offline  4490    LONGITUDE
0A8F  00:00:01:03          Offline  4490    LONGITUDE
0AE2  00:00:02:03          Online   4490    LONGITUD
0AE3  00:00:04:00          Not rdy  4490    LONGITUD
0AE4  00:00:04:03          Online   4490    LONGITUD
0AE5  01:00:10:00          Not rdy  4490    LONGITUD
0AE6  00:00:04:01          Offline  4490    LONGITUD
0AE7  00:00:04:02          Offline  4490    LONGITUD
0B30  01:00:10:03          Online   9490    LONGITUD
0B31  01:00:10:04          Online   9490    LONGITUD
0B32  01:00:10:01          Not rdy  9490    LONGITUD
0B33  01:00:10:02          Not rdy  9490    LONGITUD
0B60  00:00:02:01   VOL002 On drive 9490    LONGITUD
0B62  01:00:10:05          Offline  9490EE  (1+E+Z)
0B63  01:00:10:06          Offline  9490EE  (1+E+Z)
0B70  00:00:02:02          Online   9490    LONGITUD
0B90  00:00:02:00          Offline  SD3     DD3
Display of drives complete
```

Display Detailed Drive Information by World Wide Name and Serial Number

```
D DR ALL IDENT
```

Sample output

```
DRIVE LOCATION    MODEL    WORLD WIDE NAME         SERIAL NUMBER
0112  00:00:10:06 IBM-LTO3 50:01:04:F0:00:10:03:E7 1200019355
0114  00:00:10:28 T9840C   50:01:04:F0:00:10:04:35 500000020543
0140  00:00:12:03 T1B35    50:01:04:F0:00:10:03:90 572004000003
0141  00:00:12:13 T9840D   50:01:04:F0:00:10:03:BA 570001000288
0142  00:00:12:12 T9840C   50:01:04:F0:00:10:03:BD 500004000820
0143  00:00:12:15 T9840D   50:01:04:F0:00:10:03:B4 570001000291
0144  01:01:01:11 T9840D   50:01:04:F0:00:79:18:DA 570001000146
0145  01:00:01:07 T9840C   50:01:04:F0:00:79:19:0D 500000025713
0146  01:01:01:15 T9840C   50:01:04:F0:00:79:18:D7 500000028874
0147  01:01:01:03 T9840D   50:01:04:F0:00:79:18:E0 570001000307
Display of drives complete
```

Display Detailed Drive Information by Location

```
D DR ALL DET BYLOC
```

Sample Output

```
DRIVE LOCATION    VOLSER STATUS    MODEL     MEDIA

0AA0  00:00:02:00        Offline   4480      STANDARD
0AA1  00:00:02:01        Offline   4480      STANDARD
0AA2  00:00:02:02        Offline   4480      STANDARD
0AA3  00:00:02:03        Offline   4480      STANDARD
0B0E  00:00:03:01        Not rdy   9490      LONGITUD
0B0F  00:00:03:03        Offline   9490      LONGITUD
0AE0  00:00:10:00 TIM021 On drive  4490      LONGITUD
0AE1  00:00:10:01        Offline   4490      LONGITUD
0AE2  00:00:10:02        Offline   4490      LONGITUD
0AE3  00:00:10:03        Offline   4490      LONGITUD
0080  00:01:01:00                  9490      LONGITUD
EEEE  00:01:01:01 105772 On drive  9490      LONGITUD
0B02  00:01:01:02        Offline   9490      LONGITUD
0B03  00:01:01:03        Offline   9490      LONGITUD
0B04  00:01:03:00        Offline   9840      STK1
0B05  00:01:03:01        Offline   9840      STK1
0B06  00:01:03:02        Offline   984035    STK1
0B07  00:01:03:03        Offline   984035    STK1
0B08  00:01:03:04        Offline   T9940A    STK2
0B09  00:01:03:05        Online    T9940A    STK2
0B0A  00:01:03:06        Offline   T9940A35  STK2
0B0B  00:01:03:07        Online    T9940A35  STK2
2900  01:00:04:00        Offline   9490      LONGITUD
2901  01:00:04:01        Offline   9490      LONGITUD
2902  01:00:04:02        Offline   9490      LONGITUD
2903  01:00:04:03        Online    9490      LONGITUD
0A14  01:00:06:00        Offline   4480      STANDARD
0A15  01:00:06:01        Offline   4480      STANDARD
0A16  01:00:06:02        Offline   4480      STANDARD
0A17  01:00:06:03        Offline   4480      STANDARD
0A10  01:00:10:00        Offline   4480      STANDARD
0A11  01:00:10:01        Offline   4480      STANDARD
0A12  01:00:10:02        Offline   4480      STANDARD
0A13  01:00:10:03        Offline   4480      STANDARD
Display of drives complete
```

Display Exceptions

Syntax

```
►►─Display───┬─EXceptns─┬──────────────────────────────────────────────────►◄
             └─X────────┘
```

Parameters

EXceptns or **X**

displays the result of querying the LMU for the hardware status of the following:

- all LMUs
- all LSMs
- all CAPs
- all robotic hands
- all pass-thru ports (PTPs)
- all stations.

☞ **Note:** For an SL3000 library, pass-thru ports (PTPs) are not supported.

Errors are reported in either LSM *AA:LL* or *AA:LL:CC* format, where *AA* is the hexadecimal value for the ACS (00-FF), *LL* is the hexadecimal value for the LSM (00-17), and *CC* is the hexadecimal value for the CAP identifier (00 through 0B). The following error messages are possible:

Message:

CAP Unallocated

CAP Not Installed

CAP Not Operational

CAP Door is Open

CAP Door is Unlocked

CAP is Reserved

CAP is Reserved by Partition nnn Host nn

Pass Thru Port is Inoperative

Robot Hand is Inoperative

Robot Hand needs Maintenance

LSM is Not Ready

LSM is Offline

LSM is Offline Pending

LSM is in Maint Mode

LSM Door is Open

LMU Compat 10 or less; not all functions supported:
The LMU will not be able to respond correctly to some of the status queries until its microcode is updated. This condition will also cause SLS0662I LMU Response Error to be issued just before SLS4610I.

Station nn has Inactive Connection:
A hardware connection to the LMU is not usable. This may be normal for your configuration if the connection has never been made and is not necessary. The station number is in hex, so Station 0A is the tenth station, and Station 10 is really the sixteenth.

Station nn Inoperative; Host not responding:
The station number is in hex, so Station 0A is the tenth station, and Station 10 is really the sixteenth.

The following messages are summaries:

No CAP problems were detected

No Pass Thru Port problems were detected

No Robot Hand problems were detected

No LSM problems were detected

No Station problems were detected

Note: Message summaries only reflect that the LMU did not detect hardware errors. Something could be wrong with the software configuration, or with something that the LMU could not detect.

HSC processing continues and no user response is required.

Display LKEYDEF

Syntax

```
►►─Display──LKEYDEF──────────────────────────────────────────────────────►◄
```

Parameters

LKEYDEF
displays information about the definition data set, containing LKEYINFO statements, that is currently loaded. Definition data sets are loaded by issuing a LKEYDEF command and control statement. The display includes the name of the definition file (data set and member name if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Note: Refer to “Definition Data Set Control Statements” in the *HSC System Programmer’s Guide* for more information about definition data sets and OPTion TITLE, LKEYINFO, and LKEYDEF statements.

Example

The following example illustrates the use of the Display LKEYDEF command.

Display Information About the LKEYDEF Data Set

```
DISPLAY LKEYDEF
```

Sample Output

```
... LKEYDEF PARAMETER STATUS: xxx
    LOADED FROM SYS5.HSC.DEFS(LKEYDEFS)
    TITLE: LKEY TEST
    LOADED ON Ø3/21/Ø2 AT 1Ø:17:21
```

Display LMUPDEF

Syntax

```
►►─Display─LMUPDEF──────────────────────────────────────────────────────►◄
```

Parameters

LMUPDEF
displays information about the definition data set, containing LMUPATH statements, that is currently loaded. Definition data sets are loaded by issuing a LMUPDEF command and control statement. The display includes the name of the definition file (data set and member name if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Note: Refer to ‘‘Definition Data Set Control Statements’’ in the *HSC System Programmer's Guide* for more information about definition data sets and OPTion TITLE, LMUPATH, and LMUPDEF statements.

Users can find additional important TCP/IP-related information by referring to “Dynamic LMU Connection” in the *HSC System Programmer's Guide*.

Example

The following example illustrates the use of the Display LMUPDEF command.

Display Information About the LMUPDEF Data Set

```
DISPLAY LMUPDEF
```

Sample Output

```
... LMUPDEF PARAMETER STATUS: xxx
    LOADED FROM SPPW.PTF3490E.ITEST(HSCDATA3)
    TITLE: TAP TEST
    LOADED ON 02/21/01 AT 10:55:48
```

Display LSM

Syntax

```
►►─Display─Lsm─┬────────────────────┬──────────────────────────────►◄
               ├─lsm-id─────────────┤
               ├─lsm-range──────────┤
               │   ┌─,────────┐     │
               └─(─▼─lsm-list─┴─)───┘
```

Parameters

Lsm

displays the status of the LSMs. LSM status includes:

- LSM type
- Online/offline status
- Ready/not ready
- Automatic/manual mode status
- Panels on an LSM frozen/unfrozen
- LSM unallocated or allocated to another partition
- If one or more LSMids are specified, the display includes the following:
  - Audits in progress (if any)
  - CAP status, priority, and owning host if CAP is not drained
  - Number of free storage cells and scratch volumes

    Notes:

    - The number of free cells in the LSM **does not** include free cells on frozen panels.
    - The number of free cells is not accurate until the LSM(s) is varied online. Refer to “VARY Station Command” on page 226 for syntax information.
  - Each frozen panel, showing the total number of cells and free cells on the panel.

lsm-id or ***lsm-range*** or ***lsm-list***

identifies one or more LSMs for which the system is to display information. If you do not supply an *lsm-id*, a status summary is displayed for every LSM in the library.

Each *lsm-list* element can be either a single LSMid or an LSMid range. The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

An *lsm-id* takes the form ‘‘*AA:LL*,’’ where ‘‘*AA*’’ is the ACSid (hexadecimal 00-FF) and ‘‘*LL*’’ is the LSM number (hexadecimal 00-17).

Examples

The following examples illustrate the use of the Display Lsm command and provides sample output.

Display Summary of LSM Status

“UNALLOCATED” for LSM 03 below means this LSM is unallocated to this host group and may be unassigned or allocated to another partition.

```
D LSM

Sample Output

... LSM STATUS: 650
LSM 00:00 :
TYPE = 8500
ONLINE - READY     - AUTOMATIC
LSM 00:01 :
TYPE = 8500
ONLINE - READY     - AUTOMATIC
LSM 00:02 :
TYPE = 8500
ONLINE - READY     - AUTOMATIC  All Panels Frozen
LSM 00:03 :
TYPE = 8500
ONLINE - READY     - AUTOMATIC  UNALLOCATED
```

Display Status Information About LSMs 00:00 Through 00:01

```
D LSM 00:00-00:01

Sample Output

... LSM STATUS: 130
LSM 00:00 :
TYPE = 4410
ONLINE  - READY    - AUTOMATIC
CAP ID    SIZE       HOSTID     PRIORITY  MODE      STATUS
------------------------------------------------------------------
00:00:00    21-CELL    NONE       00        IDLE      ONLINE
SCRATCH VOLUMES AVAILABLE... 0.
FREE CELLS AVAILABLE........ 436.
LSM 00:01 :
TYPE = 4410
ONLINE  - READY    - AUTOMATIC
CAP ID    SIZE       HOSTID     PRIORITY  MODE      STATUS
------------------------------------------------------------------
00:01:00    40-CELL    HSC1       09        ENTERING  ACTIVE
00:01:01    40-CELL    NONE       08        IDLE      ONLINE
00:01:02    PCAP       NONE       00        IDLE      ONLINE
SCRATCH VOLUMES AVAILABLE... 80.
FREE CELLS AVAILABLE........ 371.
PANEL 06 FROZEN - 357 TOTAL CELLS, 287 FROZEN CELLS.
```

Display Message

Syntax

```
►►─Display──┬─Message─┬─msgnum──────────────────────────────────────►◄
            └─Msg─────┘
```

Parameters

Message or **Msg**
displays detailed information about a specified message.

msgnum
identifies the four-digit numerical portion of the message number. Leading zeros are not required. For example, in the message number SLS1661I, 1661 is the *msgnum*. Message number SLS0005I can be shortened to 5.

Example

The following example illustrates the use of the Display Message command and provides sample output.

Display Help Information for Message SLS0202I

```
D MSG 202

Sample Output

... MESSAGE ID 202 HELP INFO: xxx
... MESSAGE ID 202 HELP INFO:
SLS0202I VOLUME VVVVVV IN CELL AA:LL:PP:RR:CC IS A DUPLICATE WITH
         VOLUME IN CELL AA:LL:PP:RR:CC
         EXPLANATION: A SLUADMIN AUDIT UTILITY FUNCTION ENCOUNTERED
         MORE THAN ONE LIBRARY CARTRIDGE WITH THE SPECIFIED VOLUME
         SERIAL NUMBER (VVVVVV). THE FIRST SPECIFIED LOCATION
         (AA:LL:PP:RR:CC) REFERS TO THE DUPLICATE, WHILE THE SECOND
         REFERS TO THE ORIGINAL. IF THE AUDIT WAS ‘‘ACTIVE’’
         (APPLY(YES) SPECIFIED OR DEFAULTED ON THE CONTROL
         STATEMENT), THE VOLUME WAS EJECTED.
         SYSTEM ACTION: THE DUPLICATE VOLUME IS PHYSICALLY
         EJECTED FROM THE LIBRARY IF THE AUDIT IS ACTIVE.
         USER RESPONSE:   DEPENDING ON WHICH ONE IS SUPPOSED TO BE
         IN THE LIBRARY, THE VOLUME LEFT IN THE LIBRARY MAY HAVE TO
         BE EJECTED AND THE OTHER ONE REENTERED.
```

Display MNTD

Syntax

```
►►─Display───MNTD────────────────────────────────────────────────────────────►◄
```

Parameters

MNTD
displays the current setting of all HSC mount options set by the MNTD command.

Example

The following example illustrates the use of the Display MNTD command and provides sample output.

Display the Current Mount Options

```
D MNTD
Sample Output
...  HSC MOUNT OPTIONS: xxx
...  HSC MOUNT OPTIONS:
     MAXCLEAN - 100
     AUTOCLN  - OFF
     MOUNTMSG - ROLL
     VOLWATCH - OFF
     DISMOUNT - AUTO
     SCRATCH  - MANUAL
     MMOUNT   - DELETE
     SCRDISM  - CURRENT
     PASSTHRU - 1
     UNLOAD   - SCRATCH SCR
     ACS(00)  - FLOAT ONEJCTAUTO ON
     ACS(01)  - FLOAT OFFEJCTAUTO MSG
     ACS(02)  - FLOAT ONEJCTAUTO OFF
```

Display MONitor

Syntax

```
►►─Display──MONitor──┬───────┬──┬──────────────────┬──────────────►◄
                     └─,PGMI─┘  └─,L(──┬─cc───┬─)─┘
                                       └─name─┘
```

Parameters

MONitor
displays a list of the monitoring consoles.

PGMI
displays the status of the monitoring of move requests received by the programmatic interface.

L
displays the type of requests being monitored by the specified console. Console IDs and console names must be two to eight characters long.

cc
specifies the console ID.

name
specifies the console name.

If both **PGMI** and **L** are omitted, the status of all monitoring is displayed.

Example

The following example illustrates the use of the Display MONitor command and provides sample output.

Display the Status of Monitoring

```
D MONITOR
```

Sample Output

```
... MONITOR STATUS: xxx
NONE
```

Display OPTion

Syntax

```
►►─Display──OPTion──────────────────────────────────────────────────►◄
```

Parameters

OPTion
displays the current setting of the general HSC options set by the OPTion command.

Example

The following example illustrates the use of the Display OPTion command and provides sample output.

Display the Current HSC General Options

```
D OPT
Sample Output
... HSC GENERAL OPTIONS: xxx
         Viewtime 10
         EJlimit 100
         LOGging Standard
         Output Upper
         ENTdup Manual
         Repath Yes
         Dialog Off
         DISCmsg ACS(00) Show
         Warnmsg 5
```

Display Requests

The Display Requests command is used to display all pending LMU requests.

The output from this command is dependent on the LMU level; therefore, information about the operator command, utility, or mount driving the request is not available. If this information is required, refer to “Display Status” on page 119.

Syntax

```
►►─Display───Requests──────────────────────────────────────────────────►◄
```

Parameters

Requests
displays the status of queued LMU requests. A one-line summary is displayed for each request in the queue (e.g., ACTIVE, TEMPOUT, WAITING).

Example

The following example illustrates the use of the Display Requests command and provides sample output.

Display the Status of Queued LMU Requests

```
D REQUESTS
```

Sample Output

```
SLS2656I ACS 00: CATALOG 186 ACTIVE 01 01 10
SLS2656I ACS 00: MOVE 190 ACTIVE 01 00 10
SLS2656I ACS 00: MOUNT 191 ACTIVE 01 01 10
SLS2656I ACS 00: DISMOUNT 193 Active 01 01 10
SLS2656I ACS 00: MOUNT 194 Active 00 00 10
SLS2656I ACS 00: MOUNT 195 ACTIVE 00 00 10
SLS2654I ACS 01 has no requests queued
```

Display SCRatch

Syntax

```
►►─Display──SCRatch──┬────────┬─┬─────┬─┬─────────────────────────┬─┬────────┬──►◄
                     ├─acs-id─┤ └─ALL─┘ └─SUBpool(subpool-name)───┘ └─DETail─┘
                     └─lsm-id─┘

►─┬──────────────────────────┬───────┬───────────────────────────────────────┬───►◄
  └─MEDia(──media-type──)────┘       └───RECtech(───recording-technique──)───┘
```

Parameters

SCRatch
displays scratch count information based on the subpool in which scratch volumes are located. If **MEDia** and **RECtech** are not specified, the accumulated total of all scratch media types is displayed.

Notes:

- Only subpools containing scratch volumes are displayed, unless the **ALL** parameter is specified.
- If a scratch cartridge is a member of more than one subpool, subpool counts may be higher than the actual scratch count for an ACS or LSM.
- Non-subpool totals containing zero values are not displayed.

acs-id
identifies the ACS for which the system is to display scratch information. If you specify *acs-id* without an LSM number, the system displays scratch values for the entire ACS.

lsm-id
identifies the LSM for which the system is to display scratch information.

ALL
optionally, specifies that all scratch subpool totals, including 0 scratch count values, are to be displayed.

SUBpool
identifies the subpool for which the system is to display scratch information.

subpool-name
is the name of the subpool.

Note: Scratch subpool names are specified with the SCRPOol control statement. Refer to ''HSC Control Statements'' in the *HSC System Programmer's Guide* for more information.

DETail

optionally, displays scratch details. Scratch counts are broken down by media type.

MEDia

optionally, shows scratch counts for the specified type of media. The default is for all types of media.

Notes:

- If **MEDia** is not specified, the next scratch cartridge is selected without regard to media type.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type

identifies the media type. Valid media types are:

LONGItud

indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C (HELical) cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C). DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B), 40GB (T9840C), or 75GB (T9840D).

STK2

indicates any T9940 cartridge.

STK2P

indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P). STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

T10000T1 or **T1**

indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. **T10000T1** can be abbreviated as **T1**.

T10000TS or **TS**
indicates a smaller-capacity 120GB T10000A or 240GB T10000B cartridge. **T10000TS** can be abbreviated as **TS**.

T10000T2 or **T2**
indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**
indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

RECtech
optionally, shows scratch counts for the specified recording technique. The default is for all recording techniques. RECtech refers to the method used to record data tracks on the tape surface.

Notes:

- If **RECtech** is not specified, the next scratch cartridge is selected depending on the MEDia type that has been specified.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

recording-technique

identifies the recording technique. Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 transport.

STK1R34
indicates any 3490E-image 9840 transport.

STK1R35
indicates any 3590-image 9840 transport.

STK1RA
indicates a 3490E or 3590-image T9840A transport.

STK1RA34
indicates a 3490E-image T9840A transport.

STK1RA35
indicates a 3590-image T9840A transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK1RAB
indicates a 3490E or 3590-image T9840A or T9840B transport.

STK1RAB4
indicates a 3490E-image T9840A or T9840B transport.

STK1RAB5
indicates a 3590E-image T9840A or T9840B transport.

STK1RC
indicates a 3490E or 3590-image T9840C transport.

STK1RC34
indicates a 3490-image T9840C transport.

STK1RC35
indicates a 3590-image T9840C transport.

STK1RD
indicates any T9840D transport.

STK1RDE
indicates an encryption-enabled T9840D transport.

STK1RDN
indicates a non-encryption enabled T9840D transport.

STK1RD34
indicates a non-encryption enabled 3490E-image T9840D transport.

STK1RD35
indicates a non-encryption enabled 3590-image T9840D transport.

STK1RDE4
indicates an encryption-enabled 3490E-image T9840D transport.

STK1RDE5
indicates an encryption-enabled 3590-image T9840D transport.

STK2P
indicates any 9940 transport.

STK2P34
indicates any 3490E-image 9940 transport.

STK2P35
indicates any 3590-image 9940 transport.

STK2PA
indicates a T9940A transport.

STK2PA34
indicates a 3490E-image T9940A transport.

STK2PA35
indicates a 3590-image T9940A transport.

STK2PB
indicates a T9940B transport.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The T10000 parameters in the table below have changed. The old parameter names are being phased out and may be removed in a future product release.

Old Parameter Name:	New Parameter Name:
T1A	T10KA
T1AE	T10KAE
T1AN	T10KAN
T1B	T10KB
T1BE	T10KBE
T1BN	T10KBN

T10K
indicates all T10000 transports.

T10KN
indicates all non-encrypted T10000 transports.

T10KE
indicates all encrypted T10000 transports.

T10KA
indicates any T10000A transport.

T10KAN
indicates a non-encryption enabled 3490E- or 3590-image T10000A transport.

T1A34
indicates a non-encryption enabled 3490E-image T10000A transport.

T1A35
indicates a non-encryption enabled 3590-image T10000A transport.

T10KAE
indicates an encryption-enabled 3490E- or 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T10KB
indicates any T10000B transport.

T10KBN
: indicates a non-encryption enabled 3490E- or 3590-image T10000B transport.

T1B34
: indicates a non-encryption enabled 3490E-image T10000B transport.

T1B35
: indicates a non-encryption enabled 3590-image T10000B transport.

T10KBE
: indicates an encryption-enabled 3490E- or 3590-image T10000B transport.

T1BE34
: indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35
: indicates an encryption-enabled 3590-image T10000B transport.

T10KC
: indicates any T10000C transport.

T10KCN
: indicates a non-encryption enabled 3490E- or 3590-image T10000C transport.

T1C34
: indicates a non-encryption enabled 3490E-image T10000C transport.

T1C35
: indicates a non-encryption enabled 3590-image T10000C transport.

T10KCE
: indicates an encryption-enabled 3490E- or 3590-image T10000C transport.

T1CE34
: indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
: indicates an encryption-enabled 3590-image T10000C transport.

Examples

The following examples illustrate the use of the Display SCRatch command and provide sample output.

Display Scratch Counts for All LSMs in All ACSs

```
DISPLAY SCRATCH
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name        Media     Rectech        Count
================================================================
 LSM 00:00  MIXED               Total                       11
 LSM 00:00  S9940               Total                        4
 LSM 00:00  Non-Subpool         Total                       26
 LSM 00:00 Total                                            41
 LSM 00:01  MIXED               Total                        2
 LSM 00:01  S9940               Total                        1
 LSM 00:01  Non-Subpool         Total                       30
 LSM 00:01 Total                                            33
ACS 00      MIXED               Total                       13
ACS 00      S9940               Total                        5
ACS 00      Non-Subpool         Total                       56
ACS 00 Total                                                74
==================================================================
```

Display Detailed Scratch Information

```
DISPLAY SCRATCH DETAIL
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name         Media     Rectech        Count
===============================================================
 LSM ØØ:ØØ  MIXED                ECART     36TRACK           11
 LSM ØØ:ØØ  MIXED                Total                       11
 LSM ØØ:ØØ  S994Ø                STK2P     STK2P35            4
 LSM ØØ:ØØ  S994Ø                Total                        4
 LSM ØØ:ØØ  Non-Subpool          Total                       26
 LSM ØØ:ØØ Total                                             41
 LSM ØØ:Ø1  MIXED                ECART     36TRACK            2
 LSM ØØ:Ø1  MIXED                Total                        2
 LSM ØØ:Ø1  S994Ø                STK2Ø     STK2P35            1
 LSM ØØ:Ø1  S994Ø                Total                        1
 LSM ØØ:Ø1  Non-Subpool          Total                       3Ø
 LSM ØØ:Ø1 Total                                             33
ACS ØØ      MIXED                ECART     36TRACK           13
ACS ØØ      MIXED                Total                       13
ACS ØØ      S994Ø                STK2P     STK2P35            5
ACS ØØ      S994Ø                Total                        5
ACS ØØ      Non-Subpool          Total                       56
ACS ØØ Total                                                 74
=================================================================
```

Note: The “Non-Subpool Total” is derived by subtracting the total number of scratch tapes in the LSM from the total number of subpool scratch tapes in the LSM. If subpools are defined that include the same tape in more than one subpool, the non-subpool total will be incorrect (i.e., the tape will be counted more than once).

Display Scratch Counts for a Single ACS

```
D SCR Ø DET
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name        Media     Rectech        Count
===============================================================
 LSM ØØ:ØØ  Subpool SPØØ1       ECART     36TRACK            3
 LSM ØØ:ØØ  Subpool SPØØ1       Total                        3
 LSM ØØ:ØØ  Subpool SPOO2       DD3B      DD3                4
 LSM ØØ:ØØ  Subpool SPØØ2       DD3C      DD3               21
 LSM ØØ:ØØ  Subpool SPØØ2       Total                       25
 LSM ØØ:ØØ  Non-Subpool         Total                        2
 LSM ØØ:ØØ Total                                            3Ø
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  18TRACK           49
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  36BTRACK          11
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  36ATRACK           6
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  36TRACK           5Ø
 LSM ØØ:Ø1  Subpool SPØØ1       ECART     36TRACK           22
 LSM ØØ:Ø1  Subpool SPØØ1       Total                      138
 LSM ØØ:Ø1  Non-Subpool         Total                        4
 LSM ØØ:Ø1 Total                                           142
ACS ØØ      Subpool SPØØ1       Total                      141
ACS ØØ      Subpool SPØØ2       Total                       25
ACS ØØ      Non-Subpool         Total                        6
ACS ØØ Total                                               172
===============================================================
```

Display Scratch Counts for a Single LSM

```
D SCR Ø DET
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name        Media     Rectech        Count
===============================================================
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  18TRACK           49
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  36BTRACK          11
 LSM ØØ:Ø1  Subpool SPOO1       STANDARD  36ATRACK           6
 LSM ØØ:Ø1  Subpool SPØØ1       STANDARD  36TRACK           5Ø
 LSM ØØ:Ø1  Subpool SPØØ1       ECART     36TRACK           22
 LSM ØØ:Ø1  Subpool SPØØ1       Total                      138
 LSM ØØ:Ø1  Non-Subpool         Total                        4
 LSM ØØ:Ø1 Total                                           142
===============================================================
```

Display Scratch Counts for a Subpool

```
D SCR SUBPOOL(SPØØ1)
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name         Media     Rectech        Count
===============================================================
 LSM ØØ:ØØ  Subpool SPØØ1        Total                        3
 LSM ØØ:Ø1  Subpool SPØØ1        Total                      138
ACS ØØ      Subpool SP001        Total                      141
ACS ØØ Total                                                172
===============================================================
```

Display Scratch Counts for Subpools Containing Longitud Tapes

```
D SCR MEDIA(LONGITUD)
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name         Media     Rectech        Count
===============================================================
 LSM ØØ:ØØ  Subpool SPØØ1        ECART     36TRACK            3
 LSM ØØ:Ø1  Subpool SPØØ1        STANDARD  18TRACK           49
 LSM ØØ:Ø1  Subpool SPØØ1        STANDARD  36BTRACK          11
 LSM ØØ:Ø1  Subpool SPØØ1        STANDARD  36ATRACK           6
 LSM ØØ:Ø1  Subpool SPØØ1        STANDARD  36TRACK           5Ø
 LSM ØØ:Ø1  Subpool SPØØ1        ECART     36TRACK           22
ACS ØØ      Subpool SP001        Total                      141
ACS ØØ Total                                                172
===============================================================
```

Display Scratch Counts for DD3B Helical Tapes

```
D SCR MED(DD3B)
```

Sample Output

```
...  Scratch Summary

ACS/LSM     Subpool Name         Media     Rectech        Count
===============================================================
 LSM ØØ:ØØ                       DD3B      DD3                4
ACS ØØ                           DD3B      DD3                4
---------------------------------------------------------------
 LSM Ø1:ØØ                       DD3B      DD3               98
ACS Ø1                           DD3B      DD3               98
===============================================================
```

Note: Even though the command syntax for the example shown above is similar to the previous example, this example shows output in a non-subpooling environment. In this case, scratch counts are displayed for each LSM and ACS.

Display SCRPDEF

Syntax

```
►►─Display──SCRPDEF──────────────────────────────────────────────────►◄
```

Parameters

SCRPDEF
displays information about the definition data set, containing SCRPOol statements, that is currently loaded. Definition data sets are loaded by issuing a SCRPDEF command and control statement. The display includes the name of the definition file (data set and member name if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Note: Refer to ''Definition Data Set Control Statements'' in the *HSC System Programmer's Guide* for more information about definition data sets and OPTion TITLE, SCRPOol, and SCRPDEF statements.

Example

The following example illustrates the use of the Display SCRPDEF command.

Display Information About the SCRPDEF Data Set

```
DISPLAY SCRPDEF
```

Sample Output

```
... SCRPDEF PARAMETER STATUS: xxx
    LOADED FROM SPPW.PTF4100E.ITEST(HSCDATA1)
    TITLE: SCR TEST
    LOADED ON 04/25/01 AT 16:17:18
```

Display SRVlev

Syntax

```
►►─Display───SRVlev──────────────────────────────────────────────────────►◄
```

Parameters

SRVlev
displays the current service level of the HSC on the system from which you issue the command.

Example

The following example illustrates the use of the Display SRVlev command and provides sample output.

Display the HSC Service Level

```
D SRVLEV
```

Sample Output

```
... HSC SERVICE LEVEL FULL ACTIVE
```

Display Status

Syntax

```
►►─Display───Status──────────────────────────────────────────────────────►◄
```

Parameters

Status

displays the status of pending requests currently active on the host issuing the command. The output display provides the following information to help you resolve problems during regular execution and termination of the HSC:

- requests: Dismount, Eject, Enter, Modify, Mount, Move, Vary, View
- information about the request, including:
  - the requester (such as Operator, PGMI, Clean, job name of utility)
  - physical element (such as CAPid, Drive, LSM, Station)
  - associated element for the request (such as CAPid belonging to an audit)
  - ready status of each queue, and whether a given queue is being purged or terminated.

Notes:

- Use the Display DRives command for information on current and pending mount activity, and Display Requests for information on queued LSM requests. Refer to “Display DRives” on page 77 and “Display Requests” on page 103 for explanations of command syntax and parameters.
- When an audit is running that is a full panel or more in scope, the current cell location points to the first cell in the panel being audited.

Example

The following example illustrates the use of the Display Status command and provides sample output.

Display Status of Pending Requests on This Host

```
D STATUS

... Display Status command
Requestor Action    Element           VOLSER Associated-Element
--------- --------- ----------------- ------ -------------------
SPSRTEST  Audit     LSM 00:00         EVT001 CAPid 00:00:01
SPSRTST2  Dismount  Drive 0A38        EVT033
SPSREJCT  Eject     CAPID 01:01:00    EVT222
Operator  Enter     CAPID 01:00:00
Operator  Modify    LSM 01:00
SPSRTST1  Mount     Drive 0A30        EVT022
Clean     Mount     Drive 0A30        CLN011
Internal  Mount     Drive 0A31        EVT123
SPSRSCRR  Scrdist   ACS 00            EVT111
Operator  Vary      Station 0CC

CAP queue is READY
LMU queue is PURGING
Utility queue is READY
Mount queue is READY

Total pending mounts:       0003
Total pending dismounts:    0001
Total pending LMU requests: 0010
Total active utilities:     0002
Total active CAPs:          0002

End of Status display
```

Display THReshld

Syntax

```
►►─Display──THReshld─┬────────┬─┬───────────────────────────┬─┬────────┬─►◄
                     ├─acs-id─┤ └─SUBpool(subpool-name)─────┘ └─DETail─┘
                     └─lsm-id─┘

►─┬──────────────────────┬─┬─────────────────────────────────────┬─►◄
  └─MEDia(──media-type──)┘ └─RECtech(─recording-technique-) ─────┘
```

Parameters

THReshld
displays information about the threshold values you have set using the HSC Warn command. If **MEDia** and **RECtech** are not specified, the threshold value for the accumulated total of scratch tapes is displayed.

Notes:

- Display THReshld does not report non-subpool scratch counts. Because of this, scratch counts may not add up to scratch count totals shown for an ACS or LSM.
- If a scratch cartridge is a member of more than one subpool, subpool counts may be higher than the actual scratch count for an ACS or LSM.

acs-id
identifies the ACS for which the system is to display threshold information. If you specify *acs-id* without an LSM number, the system displays threshold values for the entire ACS.

lsm-id
identifies the LSM for which the system is to display threshold information.

SUBpool
indicates that the system is to display threshold information for a specific subpool.

subpool-name
is the name of the subpool.

Note: Scratch subpool names are specified with the SCRPOol control statement. Refer to ''Scratch Subpool Management'' in the *HSC System Programmer's Guide* for information on the SCRPOol control statement.

DETail
optionally, displays scratch threshold details. Threshold values are broken out by media types.

MEDia

optionally, shows threshold values for the specified type of media. The default is for all types of media.

Notes:

- If **MEDia** is not specified, threshold values are displayed without regard to media type.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type

identifies the media type. Valid media types are:

LONGItud

indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C (HELical) cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C). DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B), 40GB (T9840C), or 75GB (T9840D).

STK2

indicates any T9940 cartridge.

STK2P

indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P). STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

T10000T1 or **T1**

indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. T10000T1 can be abbreviated as **T1**.

T10000TS or **TS**

indicates a smaller-capacity 120GB T10000A or 120GB T10000B cartridge. T10000TS can be abbreviated as **TS**.

T10000T2 or **T2**

indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**

indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

RECtech

optionally, shows threshold values for the specified recording technique. The default is for all recording techniques. RECtech refers to the method used to record data tracks on the tape surface.

Notes:

- If **RECtech** is not specified, threshold values are determined by the MEDia type that has been specified.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

recording-technique

identifies the recording technique. Valid recording techniques are:

LONGItud

indicates any device that uses longitudinal recording.

18track

indicates a 4480 transport.

36track

indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack

indicates a 4490 (Silverton) transport.

36Btrack

indicates a 9490 (Timberline) transport.

36Ctrack

indicates a 9490EE transport.

HELical

indicates a device using helical recording.

DD3

indicates a device using helical recording.

STK1R

indicates any 9840 transport.

STK1R34
indicates any 3490E-image 9840 transport.

STK1R35
indicates any 3590-image 9840 transport.

STK1RA
indicates a 3490E or 3590-image T9840A transport.

STK1RA34
indicates a 3490E-image T9840A transport.

STK1RA35
indicates a 3590-image T9840A transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK1RAB
indicates a 3490E or 3590-image T9840A or T9840B transport.

STK1RAB4
indicates a 3490E-image T9840A or T9840B transport.

STK1RAB5
indicates a 3590E-image T9840A or T9840B transport.

STK1RC
indicates a 3490E or 3590-image T9840C transport.

STK1RC34
indicates a 3490-image T9840C transport.

STK1RC35
indicates a 3590-image T9840C transport.

STK1RD
indicates any T9840D transport.

STK1RDE
indicates an encryption-enabled T9840D transport.

STK1RDN
indicates a non-encryption enabled T9840D transport.

STK1RD34
indicates a non-encryption enabled 3490E-image T9840D transport.

STK1RD35
indicates a non-encryption enabled 3590-image T9840D transport.

STK1RDE4
indicates an encryption-enabled 3490E-image T9840D transport.

STK1RDE5
indicates an encryption-enabled 3590-image T9840D transport.

STK2P
indicates any 9940 transport.

STK2P34
indicates any 3490E-image 9940 transport.

STK2P35
indicates any 3590-image 9940 transport.

STK2PA
indicates a T9940A transport.

STK2PA34
indicates a 3490E-image T9940A transport.

STK2PA35
indicates a 3590-image T9940A transport.

STK2PB
indicates a T9940B transport.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The T10000 parameters in the table below have changed. The old parameter names are being phased out and may be removed in a future product release.

Old Parameter Name:	New Parameter Name:
T1A	T10KA
T1AE	T10KAE
T1AN	T10KAN
T1B	T10KB
T1BE	T10KBE
T1BN	T10KBN

T10K
indicates all T10000 transports.

T10KN
indicates all non-encrypted T10000 transports.

T10KE
indicates all encrypted T10000 transports.

T10KA
indicates any T10000A transport.

T10KAN
indicates a non-encryption enabled 3490E- or 3590-image T10000A transport.

T1A34
indicates a non-encryption enabled 3490E-image T10000A transport.

T1A35
indicates a non-encryption enabled 3590-image T10000A transport.

T10KAE
indicates an encryption-enabled 3490E- or 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T10KB
indicates any T10000B transport.

T10KBN
: indicates a non-encryption enabled 3490E- or 3590-image T10000B transport.

T1B34
: indicates a non-encryption enabled 3490E-image T10000B transport.

T1B35
: indicates a non-encryption enabled 3590-image T10000B transport.

T10KBE
: indicates an encryption-enabled 3490E- or 3590-image T10000B transport.

T1BE34
: indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35
: indicates an encryption-enabled 3590-image T10000B transport.

T10KC
: indicates any T10000C transport.

T10KCN
: indicates a non-encryption enabled 3490E- or 3590-image T10000C transport.

T1C34
: indicates a non-encryption enabled 3490E-image T10000C transport.

T1C35
: indicates a non-encryption enabled 3590-image T10000C transport.

T10KCE
: indicates an encryption-enabled 3490E- or 3590-image T10000C transport.

T1CE34
: indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
: indicates an encryption-enabled 3590-image T10000C transport.

Examples

The following examples illustrate the use of the Display THReshld command and provides sample output.

Display Threshold Information

```
DISPLAY THRESHLD
```

Sample Output

```
...Threshold Value Summary:

ACS/LSM     Subpool Name  Media     Rectech        Count    Thresh
==================================================================
 LSM ØØ:ØØ  MIXED         Total                       11         Ø
 LSM ØØ:ØØ  S994Ø         Total                        4         Ø
 LSM ØØ:ØØ Total                                      41        2Ø
 LSM ØØ:Ø1  MIXED         Total                        2         Ø
 LSM ØØ:Ø1  S994Ø         Total                        1         Ø
 LSM ØØ:Ø1 Total                                      33        35
ACS ØØ      MIXED         Total                       13         Ø
ACS ØØ      S994Ø         Total                        5         Ø
ACS ØØ Total                                          74         Ø
==================================================================
```

Display Detailed Threshold Information

```
D THR DETAIL
```

Sample Output

```
...Threshold Value Summary:

ACS/LSM     Subpool Name  Media     Rectech        Count    Thresh
==================================================================
 LSM ØØ:ØØ  Subpool POOL1 STANDARD  18TRACK            8         5
 LSM ØØ:ØØ  Subpool POOL1 Total                        9         5
 LSM ØØ:ØØ  Subpool POOL2 DD3C      DD3                9         Ø
 LSM ØØ:ØØ  Subpool POOL2 Total                        9         Ø
 LSM ØØ:ØØ                STANDARD  18TRACK           89         Ø
 LSM ØØ:ØØ                ECART     36BTRACK          32         Ø
 LSM ØØ:ØØ                ECART     36ATRACK          19         Ø
 LSM ØØ:ØØ                DD3B      DD3                1         Ø
 LSM ØØ:ØØ                DD3C      DD3                9         Ø
 LSM ØØ:ØØ Total                                     15Ø         Ø
 LSM ØØ:Ø1  Subpool POOL2 DD3C      DD3               1Ø         Ø
 LSM ØØ:Ø1  Subpool POOL2 Total                       1Ø         Ø
 LSM ØØ:Ø1                STANDARD  18TRACK           23         Ø
 LSM ØØ:Ø1                ECART     36BTRACK          6Ø         Ø
 LSM ØØ:Ø1                ECART     36ATRACK          17         Ø
 LSM ØØ:Ø1                DD3B      DD3               11         Ø
 LSM ØØ:Ø1                DD3C      DD3               14         Ø
 LSM ØØ:Ø1 Total                                     125         Ø
 LSM ØØ:Ø2  Subpool POOL2 DD3C      DD3               12         Ø
 LSM ØØ:Ø2  Subpool POOL2 Total                       12         Ø
 LSM ØØ:Ø2                STANDARD  18TRACK            8         Ø
 LSM ØØ:Ø2                ECART     36BTRACK           1         Ø
 LSM ØØ:Ø2                ECART     36ATRACK          1Ø         Ø
 LSM ØØ:Ø2                DD3C      DD3               17         Ø
 LSM ØØ:Ø2 Total                                      36         Ø
ACS ØØ      Subpool POOL1 STANDARD  18TRACK            8         Ø
ACS ØØ      Subpool POOL1 Total                        8         Ø
ACS ØØ      Subpool POOL2 DD3C      DD3               31         Ø
ACS ØØ      Subpool POOL2 Total                       31         Ø
ACS ØØ      Subpool POOL3 STANDARD  18TRACK          12Ø         Ø
ACS ØØ      Subpool POOL3 ECART     36BTRACK          93         Ø
ACS ØØ      Subpool POOL3 ECART     36ATRACK          46         Ø
ACS ØØ      Subpool POOL3 DD3B      DD3               12         Ø
ACS ØØ      Subpool POOL3 DD3C      DD3               4Ø         Ø
ACS ØØ Total                                         311         Ø
-----------------------------------------------------------------
 LSM Ø1:ØØ  Subpool POOL3 STANDARD  18TRACK           1Ø         Ø
 LSM Ø1:ØØ  Subpool POOL3 Total                       1Ø         Ø
 LSM Ø1:ØØ                STANDARD  18TRACK           21         Ø
 LSM Ø1:ØØ Total                                      21         Ø
 LSM Ø1:Ø1 Total                                       Ø         Ø
ACS Ø1      Subpool POOL3 STANDARD  18TRACK           1Ø         Ø
ACS Ø1      Subpool POOL3 Total                       1Ø         Ø
ACS Ø1      Subpool POOL3 STANDARD  18TRACK           21         Ø
ACS Ø1 Total                                          21         Ø
==================================================================
```

Display Threshold Information for a Subpool

```
D THR SUBPOOL(POOL2)
```

Sample Output

```
...Threshold Value Summary:

ACS/LSM     Subpool Name  Media     Rectech        Count    Thresh
==================================================================
 LSM 00:00  Subpool POOL2 Total                        9         0
 LSM 00:01  Subpool POOL2 Total                       10         0
 LSM 00:02  Subpool POOL2 Total                       12         0
ACS 00      Subpool POOL2 Total                       31         0
==================================================================
```

Display Detailed Threshold Information for a Media Type

```
D THR SUB(POOL2) DET MEDIA(DD3C)
```

Sample Output

```
...Threshold Value Summary:

ACS/LSM     Subpool Name  Media     Rectech        Count    Thresh
==================================================================
 LSM 00:00  Subpool POOL2 DD3C      DD3                9         0
 LSM 00:00  Subpool POOL2 Total                        9         0
 LSM 00:01  Subpool POOL2 DD3C      DD3               10         0
 LSM 00:01  Subpool POOL2 Total                       10         0
 LSM 00:02  Subpool POOL2 DD3C      DD3               12         0
 LSM 00:02  Subpool POOL2 Total                       12         0
ACS 00      Subpool POOL2 DD3C      DD3               31         0
==================================================================
```

Display TREQDEF

Syntax

```
►►─Display──TREQDEF──────────────────────────────────────────────────────►◄
```

Parameters

TREQDEF
displays information about the definition data set, containing TAPEREQ statements, that is currently loaded. Definition data sets are loaded by issuing a TREQDEF command and control statement. The display includes the name of the definition file (data set and member name if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Note: Refer to ‘‘Definition Data Set Control Statements’’ in the *HSC System Programmer’s Guide* for more information about definition data sets and OPTion TITLE, TAPEREQ, and TREQDEF statements.

Example

The following example illustrates the use of the Display TREQDEF command.

Display Information About the TREQDEF Data Set

```
DISPLAY TREQDEF
```

Sample Output

```
... TAPEREQ PARAMETER STATUS: xxx
    LOADED FROM SPPW.PTF349ØE.ITEST(HSCDATA1)
    TITLE: TAP TEST
    LOADED ON Ø5/21/ØØ AT Ø9:32:14
```

Display UNITDEF

Syntax

```
►►─Display──UNITDEF──────────────────────────────────────────────────────►◄
```

Parameters

UNITDEF
displays information about the definition data set containing UNITATTR statements. The display includes the name of the definition file (data set and member name, if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Example

The following example illustrates the use of the Display UNITDEF command.

Display Information About the UNITDEF Data Set

```
DISPLAY UNITDEF
```

Sample Output

```
... UNITDEF PARAMETER STATUS: xxx
    LOADED FROM SYS4.HSC.DEFS(UNITDEFS)
    TITLE: TAP TEST
    LOADED ON 05/16/00 AT 07:55
```

Note: In the sample output above, *xxx* is the unique message sequence number assigned to multiple-line messages. This number appears in the left column of all subsequent lines of the message.

Display VOLDEF

Syntax

```
►►─Display──VOLDEF───────────────────────────────────────────────────►◄
```

Parameters

VOLDEF
displays information about the definition data set, containing VOLATTR statements, that is currently loaded. Definition data sets are loaded by issuing a VOLDEF command and control statement. The display includes the name of the definition file (data set and member name if appropriate), the identifying string if the data set contains an OPTion TITLE statement, and the date and time the parameters were loaded.

Note: Refer to ''Definition Data Set Control Statements'' in the *HSC System Programmer's Guide* for more information about definition data sets and OPTion TITLE, VOLATTR, and VOLDEF statements.

Example

The following example illustrates the use of the Display VOLDEF command.

Display Information About the VOLDEF Data Set

```
DISPLAY VOLDEF
```

Sample Output

```
... VOLDEF PARAMETER STATUS: xxx
    LOADED FROM SPPW.PTF3490E.ITEST(HSCDATA2)
    TITLE: SER TEST
    LOADED ON 05/21/00 AT 09:56:51
```

Display Volume

Syntax

```
►►─Display──┬─Volser─┬──┬─volser──────────────┬──┬────────┬──────────────►◄
            └─Volume─┘  ├─vol-range───────────┤  └─DETail─┘
                        │     ┌─,────────┐    │
                        └─(───▼─vol-list─┴─)──┘
```

Parameters

Volser or **Volume**
displays volume locations for the specified volumes. The information displayed includes:

- status of volume (selected or unselected) and its location
- in the case of an errant volume, the source, destination, and home location

volser or ***vol-range*** or ***vol-list***
identifies one or more VOLSERs for which the system is to display status. Each *vol-list* element can be either a single VOLSER or a VOLSER range.

Note: You can display a range of up to 100 volumes.

List elements must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

DETail
optionally displays all available information about the specified volume(s).

Note: The minimum acceptable abbreviation for DETail is “DET.”

The information displayed includes:

- the home cell location
- whether or not the volume is a scratch cartridge
- whether or not the volume is selected
- the owning host (displayed if the volume is selected)
- the drive address or drive ID (displayed if the volume is mounted)
- whether or not an external label is present
- whether or not the media label is readable by the robotic vision system (displayed if the external label exists)
- when the volume was last inserted into the library
- when the volume was last selected

- the select count
- the media type for the volume
- the recording technique for the volume
- whether or not the media label was readable (**N/A** appears if the value was not read from the LMU)
- how the media type has been determined for the volume. The values that appear in this field are:

YES	The media label and the VOLATTR defined for the volume agree.
NO	The media label and the VOLATTR defined for the volume do not agree.
VOLATTR Only	A VOLATTR has been defined, but the LMU has not determined the media type.
Label Only	The LMU has determined the media type, but a VOLATTR has not been defined.
Undefined	A VOLATTR has not been defined, and the LMU has not determined the media type.

- whether or not the volumes are unusable (i.e., spent cleaning cartridges)
- the volume density for STK1 and STK2 media volumes.

Example

The following example illustrates the use of the Display Volume command and provides sample output.

Display All Available Information About VOLSER RW0001

```
DISPLAY VOLUME RWØØØ1 DETAIL

Sample output

...   VOLUME RWØØØ1 - DETAIL: xxx
    HOME CELL:      ØØ:Ø1:1Ø:Ø8:Ø1
    SCRATCH:        NO
    SELECTED:       NO
    MOUNTED:        DRIVE AEØ
    EXTERNAL LABEL: YES
    LABEL READABLE: YES
    INSERTED:       Ø3/Ø2/95   2Ø:29:19
    LAST SELECTED:  Ø4/Ø1/95   Ø7:15:33
    SELECT COUNT:   Ø12
    MEDIA TYPE:     DD3A
    RECTECH:        DD3
    MEDIA LABEL:    READABLE
    MEDIA MATCH:    YES
    DENSITY:        STK1RAB
```

DRAIN CAP Command

The DRAin command terminates an eject or enter operation on one or more CAPs, which frees the CAP resources for use by other processes. Refer to “EJECT Command” on page 142 and “ENTER Command” on page 159 for details on command syntax and parameters. Refer to ‘‘Overview of Library Utilities’’ in the *HSC System Programmer’s Guide* for information on utilities.

The DRAin command can be used to terminate an EJect command or EJECt utility on one or more CAPs before all specified cartridges are ejected. For the EJect command the action taken by the HSC for volumes associated with the drained CAPs is determined by the setting of the OPTion REPATH command. Refer to “OPTION Command and Control Statement” on page 197 for additional information.

An ENter command requires dedicated use of CAPs because it allows you to enter any number of cartridges into the library. When you are finished using a CAP to enter cartridges, you must issue a DRAin command to release the CAP and make it available for other work.

The DRAin command must be issued from the same host as the corresponding EJect or ENter command or utility. If a DRAin is attempted for the wrong command, an error message is issued.

Notes:

- When the DRAin command is issued, the LSM robot uses its camera to make sure that the CAP is empty before the command is executed. An ENter command does not stop until all cartridges in the CAP are processed.
- The DRAin command has no affect on an ENter command that is using an automatic mode CAP. The DRAin command can be issued against an automatic mode CAP that is being used by either an EJect command or EJECt utility.
- The status of a CAP can be determined using the Display Cap command (refer to “Display Cap” on page 69 for details on command syntax and parameters).
- If you cannot drain a CAP because it is allocated to a now failed host, refer to “Freeing an Allocated CAP” on page 353 for recovery procedures.

Syntax

```
                                            ┌─ENter──┐
►►─DRAin───┬─cap-id──────────────────┬─────┤        ├──────────────────────────►◄
           │   ┌─,─────────┐         │     └─EJect──┘
           └─( ▼─cap-list──┴─ )──────┘
```

Command Name

DRAin

initiates the DRAin command.

Parameters

cap-id or ***cap-list***

specifies one or more CAPs to be drained. The CAPids specified on a DRAin command must match the CAPids specified on the associated EJect or ENter command.

The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid (*AA* is the ACSid, hexadecimal 00-FF; *LL* is the LSM number, hexadecimal 00-17), and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 libraries, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.
- For SL8500 libraries, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP.
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as “not installed.” This keeps CAP addresses from changing as new CAPs are added.
- Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

Each *cap-list* element can be either an *lsm-id* or a *cap-id* that describes a specific CAP. The elements in a list must be separated by a comma or a blank, and the entire list must be enclosed in parentheses.

ENter
specifies that an enter operation is to be terminated on the specified CAPs. ENter is the default.

EJect
specifies that an eject operation is to be terminated on the specified CAPs.

Examples

The following examples illustrate the use of the DRAin command.

Terminate the ENter Command Controlling CAPid 00:00:00

```
DRAIN 00:00:00 ENTER
```

Terminate the ENter Command On CAPids 00:03:00 & 00:03:01

```
DRA (00:03:00,00:03:01)
```

Terminate the EJect Command on CAPids 00:00:01 and 00:01:00

```
DRAIN (00:00:01,00:01:00) EJECT
```

EJECT Command

The EJect command directs the robot to take cartridges from inside an LSM and place them into a CAP, where they can be removed by the operator. One or more CAPs can be specified by the operator or a CAP can be automatically selected by the HSC based on CAP preference. (Refer to “CAP Preference (CAPPref) Command and Control Statement” on page 41 for information on setting CAP preference values.)

Up to 9999 cartridges can be ejected with one EJect command. (Refer to “OPTION Command and Control Statement” on page 197 for information on how to set the eject limit with the OPTion EJLimit command.) Each time the CAP is filled, or when all specified cartridges have been placed in the CAP, the CAP is unlocked and the HSC displays a console message instructing the operator to empty the CAP. The operator must open the CAP, remove all cartridges, and close the CAP. Each time the CAP is closed the robot scans the CAP (called a CAP catalog).

One of the following occurs:

- the eject operation terminates if all specified cartridges have been ejected.
- the robot resumes filling the CAP until either the CAP is full, or the remaining specified cartridges have been placed in the CAP.

Note: Use the SLUADMIN EJECt utility or the programmatic interface EJECT request to eject more than 9999 cartridges in one operation. The parameter defaults (such as *cap-id*) for the EJECt utility are different than the parameter defaults for the EJect command. Refer to ‘‘EJECt Cartridge Utility’’ in the *HSC System Programmer’s Guide* for information on the EJECt utility and programmatic interface EJECT request.

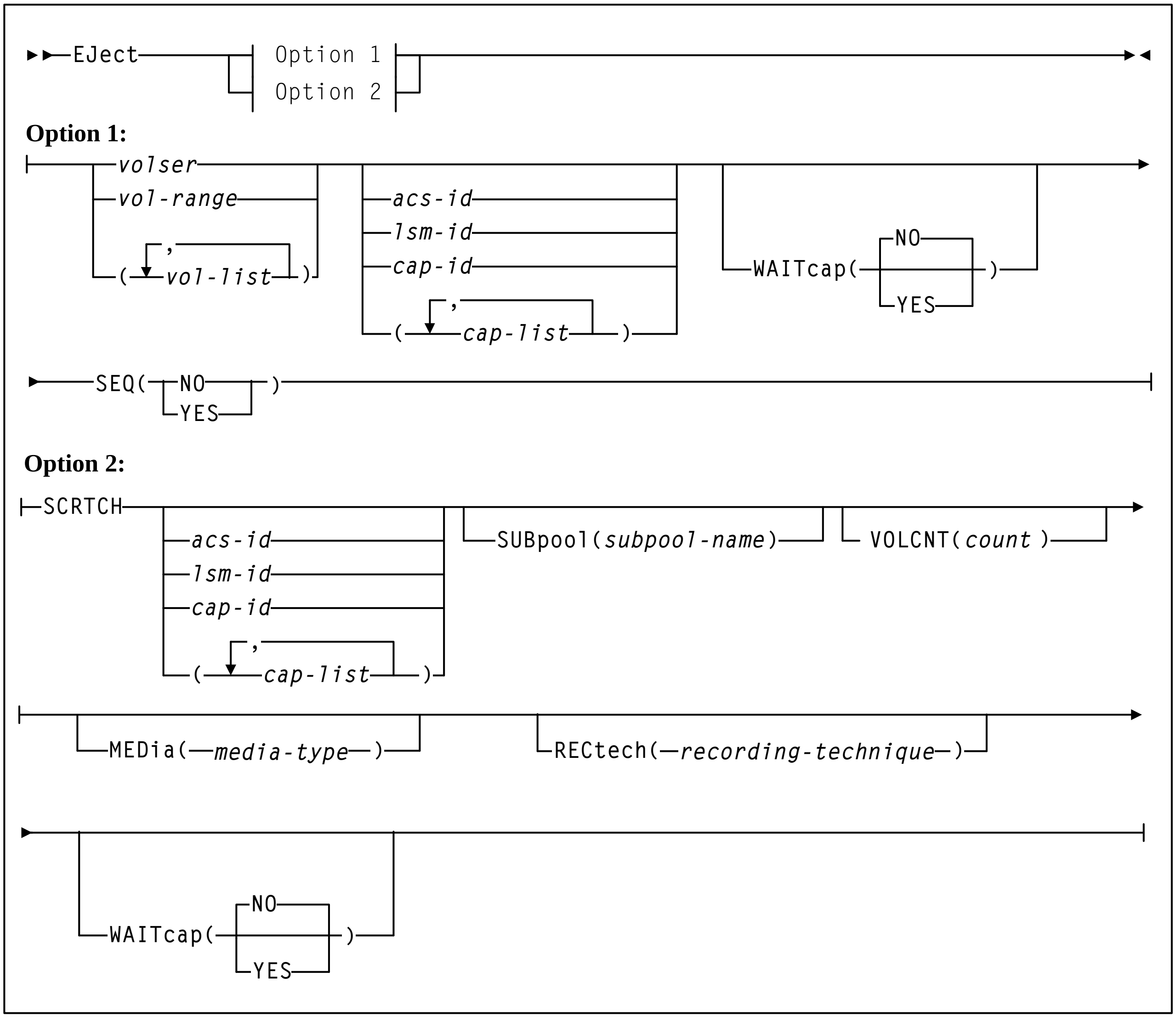
The EJect command allows you to identify specific VOLSERs or indicate a count of scratch cartridges to be ejected. When a volume is ejected, it is erased from the control data set and is no longer considered under library control.

If a media type (MEDia) or recording technique (RECtech) is not specified, any type of cartridge is ejected. That is, the next scratch cartridge is selected without taking media type and recording technique into consideration.

Notes:

- When the EJect command is issued, the robot uses its camera to make sure that the CAP is empty before the command is executed.
- The operator is prompted for a password if a nonblank eject password was specified in the EJCTPAS parameter on the LIBGEN SLILIBRY macro.

Syntax



Command Name

Eject
initiates the EJect command.

Parameters

volser or ***vol-range*** or ***vol-list***
specifies one or more cartridges to be ejected. The VOLSERs are sorted in sequential order. VOLSERs that do not reside in the ACS are removed from the list.

Each *vol-list* element can be either a single VOLSER or a VOLSER range. The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

Notes:

- If you designate specific volumes to be ejected but do not enter an ACS, LSM, or CAP identifier, the HSC allocates a non-zero preference CAP in each ACS that contains one or more of these volumes.

  When you are ejecting to one or more SL8500 CAPs, the volume list is not ejected sequentially. Rather, the volume list is reordered by cell location to utilize all hand-bots.

- Use the OPTion EJLimit command to set the number of cartridges that can be ejected with one EJect command. Refer to "OPTION Command and Control Statement" on page 197 for details on command syntax and parameters. The initial value for the HSC is set to 100 cartridges.

acs-id
identifies the ACS containing the cartridges to eject. The HSC selects a nonzero preference CAP within the ACS.

lsm-id
identifies one of the following:

- an LSM with a single CAP
- an LSM that contains multiple CAPs. The HSC selects an available manual mode CAP with the highest nonzero preference. CAPid 00 is selected if it is available, in manual mode, and has a preference value equal to or higher than other available manual mode CAPs in the LSM.

The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

cap-id or ***cap-list***
identifies one or more specific CAPs to use regardless of availability or CAP preference. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid, and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 libraries, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP.
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.
- For SL8500 libraries, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

☞ **Notes:**

- If SL3000 library CAPs are not present, the HSC reports them as “not installed.” This keeps CAP addresses from changing as new CAPs are added.
- Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

Each *cap-list* element can be either an *lsm-id* or a *cap-id*. The elements in a list must be separated by a comma or a blank, and the entire list must be enclosed in parentheses.

Notes:

- When one CAP is specified, the cartridges are processed sequentially by VOLSER.

  However, when you are ejecting to one or more SL8500 CAPs, the volume list is not ejected sequentially. Rather, the volume list is reordered by cell location to utilize all hand-bots.

- When two CAPs within the same LSM are specified, the list of VOLSERs is ordered such that volumes will be assigned to the lowest numbered CAP first until the capacity of the CAP is reached, then volumes are assigned to the other CAP up to its capacity. This process continues until all volumes are assigned to a CAP. During the EJect all CAPs are used at the same time.

  For example, if CAPids 00:00:00 and 00:00:01 in an enhanced CAP are being used to eject VOLSERs VOL001-VOL100, VOL001-VOL040 and VOL081-VOL100 are assigned to CAP 00:00:00, and VOL041-VOL080 are assigned to CAP 00:00:01. The robot begins placing cartridges into both CAPs. Each CAP is unlocked when it is full. After the operator empties and closes CAP 00:00:00, the robot begins filling it with VOL081-VOL100.

- When multiple CAPs are specified across LSMs, volumes are associated with a CAP that is the fewest number of pass-thrus away. CAPs that have no associated volumes are released.

- When SCRTCH is specified (with or without SUBpool), volumes are assigned to a CAP that is the fewest number of pass-thrus away. CAPs that have no associated volumes are released.

- When a DRAin is issued against a CAP, or a CAP is made unavailable, the OPTion REPATH setting determines how the cartridges associated with the CAP are processed. Refer to “OPTION Command and Control Statement” on page 197 for details on command syntax and parameters.

WAITcap

specifies whether or not a list of ejecting volumes waits for an available CAP if one is not available.

NO

specifies that the eject process does not wait for a CAP if it is not available. **NO** is the default**.**

YES

specifies that the eject process waits indefinitely for a CAP to become available.

SEQ

specifies whether or not CAP eject processing fills the CAP cells in the same order specified by the ***volser*** parameter.

Notes:

- If **SEQ** is not specified, but two CAPs are requested in the same LSM, and the LSM is not an SL8500, cartridges in the ACS are ejected in sequential order.
- For best performance, **SEQ(NO)** is recommended.

NO

specifies to eject the requested volumes in the order of home cell location. Eject processing fills the CAP or magazine (for the SL8500) according to the distance of the home cell to the CAP or magazine; that is, volumes closest to the CAP or magazine are ejected first.

YES

specifies to eject cartridges to the CAP in the order the volumes are listed in the associated ***volser*** parameter. The first cartridge requested appears in the topmost CAP cell, the second cartridge requested appears in the next CAP cell, and so on until the CAP is full or all cartridges have been moved to the CAP.

SCRTCH

indicates that scratch volumes are to be ejected.

Note: If you do not supply acs-id, lsm-id, cap-id, or cap-list, the HSC selects an available nonzero preference CAP in ACS 00, and scratch volumes are ejected from ACS 00 only.

acs-id

identifies the ACS containing the cartridges to eject. The HSC selects a nonzero preference CAP within the ACS.

lsm-id

identifies one of the following:

- an LSM with a single CAP
- an LSM that contains multiple CAPs. The HSC selects an available manual mode CAP with the highest nonzero preference. CAPid 00 is selected if it is available, in manual mode, and has a preference value equal to or higher than other available manual mode CAPs in the LSM.

The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

cap-id or cap-list

identifies one or more specific CAPs to use regardless of availability or CAP preference. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid, and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as “not installed.” This keeps CAP addresses from changing as new CAPs are added.
- Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

SUBpool

indicates to the system that scratch cartridges are to be selected from a designated subpool. If you do not specify this parameter, the HSC selects from subpool 0, which contains all scratch tapes in the ACS including scratch tapes in named subpools.

subpool-name

is the name of the subpool.

Note: Scratch subpool names are specified with the SCRPool control statement. Refer to ‘‘Scratch Subpool Control Statement’’ in the *HSC System Programmer’s Guide* for information on the SCRPool control statement.

VOLCNT

allows the user to specify the number of scratch volumes to be ejected. One cartridge is ejected if the VOLCNT parameter is not specified.

count

is a decimal value in the range from 1 through 9999.

Note: Use the OPTion EJLimit command to set a maximum limit on the number of cartridges that can be ejected with one EJect command. Refer to “OPTION Command and Control Statement” on page 197 for details on command syntax and parameters.

MEDia

specifies the type of scratch media (cartridge) that is to be ejected.

Notes:

- If **MEDia** is not specified, the next scratch cartridge is selected without regard to media type.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type

identifies the media type. Valid media types are:

LONGItud

indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C (HELical) cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C). DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1
indicates any T9840 cartridge.

STK1R
indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B) or 40GB (T9840C) or 75GB (9840D).

STK2
indicates any T9940 cartridge.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P). STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

T10000T1 or **T1**
indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. T10000T1 can be abbreviated as **T1**.

T10000TS or **TS**
indicates a smaller-capacity 120GB T10000A or 120GB T10000B cartridge. T10000TS can be abbreviated as **TS**.

T10000T2 or **T2**
indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**
indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

RECtech
specifies the scratch method used to record data tracks on the tape surface.

Notes:

- If RECtech is not specified, the next scratch cartridge is selected depending on the MEDia type that has been specified.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

recording-technique

identifies the recording technique. Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 transport.

STK1R34
indicates any 3490E-image 9840 transport.

STK1R35
indicates any 3590-image 9840 transport.

STK1RA
indicates a 3490E or 3590-image T9840A transport.

STK1RA34
indicates a 3490E-image T9840A transport.

STK1RA35
indicates a 3590-image T9840A transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK1RAB
indicates a 3490E or 3590-image T9840A or T9840B transport.

STK1RAB4
indicates a 3490E-image T9840A or T9840B transport.

STK1RAB5
indicates a 3590E-image T9840A or T9840B transport.

STK1RC
indicates a 3490E or 3590-image T9840C transport.

STK1RC34
indicates a 3490-image T9840C transport.

STK1RC35
indicates a 3590-image T9840C transport.

STK1RD
indicates any T9840D transport.

STK1RDE
indicates an encryption-enabled T9840D transport.

STK1RDN
indicates a non-encryption enabled T9840D transport.

STK1RD34
indicates a non-encryption enabled 3490E-image T9840D transport.

STK1RD35
indicates a non-encryption enabled 3590-image T9840D transport.

STK1RDE4
indicates an encryption-enabled 3490E-image T9840D transport.

STK1RDE5
indicates an encryption-enabled 3590-image T9840D transport.

STK2P
indicates any 9940 transport.

STK2P34
indicates any 3490E-image 9940 transport.

STK2P35
indicates any 3590-image 9940 transport.

STK2PA
indicates a T9940A transport.

STK2PA34
indicates a 3490E-image T9940A transport.

STK2PA35
indicates a 3590-image T9940A transport.

STK2PB
indicates a T9940B transport.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The T10000 parameters in the table below have changed. The old parameter names are being phased out and may be removed in a future product release.

Old Parameter Name:	New Parameter Name:
T1A	T10KA
T1AE	T10KAE
T1AN	T10KAN
T1B	T10KB
T1BE	T10KBE
T1BN	T10KBN

T10K
indicates all T10000 transports.

T10KN
indicates all non-encrypted T10000 transports.

T10KE
indicates all encrypted T10000 transports.

T10KA
indicates any T10000A transport.

T10KAN
indicates a non-encryption enabled 3490E- or 3590-image T10000A transport.

T1A34
indicates a non-encryption enabled 3490E-image T10000A transport.

T1A35
indicates a non-encryption enabled 3590-image T10000A transport.

T10KAE
indicates an encryption-enabled 3490E- or 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T10KB
indicates any T10000B transport.

T10KBN
: indicates a non-encryption enabled 3490E- or 3590-image T10000B transport.

T1B34
: indicates a non-encryption enabled 3490E-image T10000B transport.

T1B35
: indicates a non-encryption enabled 3590-image T10000B transport.

T10KBE
: indicates an encryption-enabled 3490E- or 3590-image T10000B transport.

T1BE34
: indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35
: indicates an encryption-enabled 3590-image T10000B transport.

T10KC
: indicates any T10000C transport.

T10KCN
: indicates a non-encryption enabled 3490E- or 3590-image T10000C transport.

T1C34
: indicates a non-encryption enabled 3490E-image T10000C transport.

T1C35
: indicates a non-encryption enabled 3590-image T10000C transport.

T10KCE
: indicates an encryption-enabled 3490E- or 3590-image T10000C transport.

T1CE34
: indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
: indicates an encryption-enabled 3590-image T10000C transport.

WAITcap

specifies whether or not a list of ejecting volumes waits for an available CAP if one is not available.

NO

specifies that the eject process does not wait for a CAP if it is not available. **NO** is the default**.**

YES

specifies that the eject process waits indefinitely for a CAP to become available.

Examples

The following examples illustrate the use of the EJect command.

Eject Cartridge 123456 Using a CAP in ACS 00

```
EJECT 123456
```

Eject VOLSERs EDU026-EDU035 Using a CAP in LSM 00:01

```
EJ EDU026-EDU035 00:01
```

Eject Cartridges EDU037 & EDU086 Using a CAP in ACS 01

```
EJ (EDU037,EDU086),01
```

Eject a Scratch Cartridge From Default Subpool Using CAPid 00:01

```
EJ SCRTCH 00:01
```

Eject 10 Scratches From PAYROLL Subpool Using CAPid 00:01:00

```
EJ SCRTCH 00:01:00 SUB(PAYROLL) VOLCNT(10)
```

Eject 100 Scratches From Subpool BACKUP Using Multiple CAPs

```
EJ SCRTCH (00:03:00,00:03:01) SUB(BACKUP) VOLCNT(100)
```

Eject One Standard Cartridge

```
EJECT SCRTCH MEDIA(STD)
```

Eject Five SD-3 Cartridges

```
EJECT SCRTCH RECTECH(DD3) VOLCNT(5)
```

ENTER Command

The ENter command makes a CAP available to the operator for entering cartridges into an LSM. The LSM must be operating in automatic mode, which means that the robot is fully functional (see “Automatic Mode” on page 14). The CAP must be in manual mode, which means that it is locked when not in use (see “CAP Preference (CAPPref) Command and Control Statement” on page 41). The ENter command is rejected if the CAP is in automatic mode.

Notes:

- When a cartridge is entered, if the vision system does not detect a media label, the cartridge is entered and the media type defaults to Standard. If the media label is unreadable, a message is displayed prompting the operator to supply a valid media type or eject the cartridge. VOLATTR information is not used during ENter processing.
- StorageTek recommends that users provide an external media label for all cartridges. **The SL3000 and SL8500 libraries will not enter a non-labeled cartridge.**

One CAP is allocated to each ENter command allowing the operator to enter cartridges into the LSM without interrupting other work. In a multiple-LSM configuration, or for an LSM that contains multiple CAPs, you can specify the CAP to be used or have the HSC select an available CAP based on CAP preference. Refer to “CAP Preference (CAPPref) Command and Control Statement” on page 41 for details on setting CAP preference values.

Caution: For all CAPs except SL3000s and SL8500s, do not leave empty CAP cells between cartridges. Cartridges placed after an empty cell are not entered. The robot scans each CAP cell for a cartridge and stops when it finds the first empty cell.

The CAP can be refilled as many times as necessary to enter cartridges (as long as empty storage cells exist in the ACS). Each time the CAP is closed the robot scans the CAP (called a CAP catalog). If it finds cartridges in the CAP, the robot picks up the cartridges and stores them in cell locations selected by the HSC.

The CAP remains in enter mode until a DRAin command is issued to release it (see “DRAIN CAP Command” on page 138), unless the CAP is in automatic mode.

Notes:

- When the ENter command is issued, the robot uses its camera to make sure that the CAP is empty before the command is executed.
- In a dual LMU environment, enter operations must be restarted after an LMU switch.
- Use the Display Cap command to determine the status of a CAP (refer to “Display Cap” on page 69 for details on command syntax and parameters).

Syntax

```
        ┌─00──────┐
►►─ENter─┼─────────┼──┬─────────────────┬──┬─────────┬──────────►◄
        ├─acs-id──┤  └─TLSM(lsm-id)─┘  └─SCRatch─┘
        ├─lsm-id──┤
        └─cap-id──┘
```

Command Name

ENter
initiates the ENter command.

Parameters

acs-id
specifies the ACS where cartridges are to be entered. The HSC selects a nonzero preference manual mode CAP within the ACS to use.

lsm-id
identifies one of the following:

- an LSM with a single CAP
- an LSM that contains multiple CAPs. The HSC selects an available manual mode CAP with the highest nonzero preference. CAPid 00 is selected if it is available, in manual mode, and has a preference value equal to or higher than other available manual mode CAPs in the LSM.

The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

cap-id
identifies a specific manual mode CAP to use regardless of availability or CAP preference. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid, and *CC* is one of the following:

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as "not installed." This keeps CAP addresses from changing as new CAPs are added.
- Refer to "How to Specify a CAPid" on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

00

is the default ACSid. If you do not supply an *acs-id*, *cap-id*, or *lsm-id* the HSC selects an available manual mode CAP in ACS 00 based upon the preference values set with the CAPPref command.

TLSM

specifies the LSM to receive the entered cartridges.

lsm-id

identifies one of the following:

- an LSM with a single CAP
- an LSM that contains multiple CAPs. The HSC selects an available manual mode CAP with the highest nonzero preference. CAPid 00 is selected if it is available, in manual mode, and has a preference value equal to or higher than other available manual mode CAPs in the LSM.

The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

SCRatch

optionally enables you to put the volumes you enter into scratch status. If you do not specify that the volumes are to be given scratch status, the system enters them as nonscratch volumes.

Examples

The following examples illustrate the use of the ENter command.

Enter Cartridges Using CAPid 00:02:01

```
ENTER ØØ:Ø2:Ø1
```

Enter Cartridges Using an Available CAP in ACS 01

```
EN Ø1
```

Enter Cartridges Using an Available CAP in ACS 00

```
EN
```

Enter Cartridges Using CAPid 00:01:00 into LSMid 00:03

```
EN ØØ:Ø1:ØØ TLSM(ØØ:Ø3)
```

Enter Scratch Cartridges into LSMid 00:01

```
EN ØØ:Ø1 SCR
```

JOURNAL Command

The Journal command is used to establish the action taken by the HSC if both journals fill to capacity before a control data set backup or a journal off-load is executed. When journaling is used as a recovery technique, the HSC is initially set to ABEND when both journals become full. The Journal command allows you to direct the HSC to disable journaling and continue running when both journals become full. Refer to ‘‘Control Data Set Recovery Strategies’’ in the *HSC Installation Guide* for information on specifying journaling as a control data set recovery technique.

Note: Use the Display CDS command to display the status of journals. Refer to “Display CDS” on page 72 for details on command syntax and parameters.

Syntax

```
►►─Journal──Full(──┬─ABEND────┬─)──────────────────────────►◄
                   └─Continue─┘
```

Command Name

Journal
initiates the Journal command.

Parameters

Full
establishes the action taken by the HSC if both journals fill to capacity before a control data set backup or a journal off-load is executed.

ABEND
directs the HSC for this host to ABEND when both journals become full.

Continue
directs the HSC to disable journaling for this host and continue running when both journals become full.

Notes:

- If journaling is disabled and the HSC continues to run, the existing journals immediately become outdated as control data set transactions occur. All current journals on all hosts, and prior off-load copies, as well as the last control data set backup, are invalid.
- The BACKup utility resets journaling. If you run the BACKup utility while journaling is disabled, all journals are reset and journaling automatically becomes active again.

Example

The following example illustrates the use of the Journal command.

Disable Journaling & Continue Running if Both Journals Are Full

```
JOURNAL FULL(CONTINUE)
```

MNTD (Mount/Dismount Options) Command and Control Statement

The MNTD command and control statement offers you options on how the HSC processes the mounting and dismounting of library volumes. The following options are available:

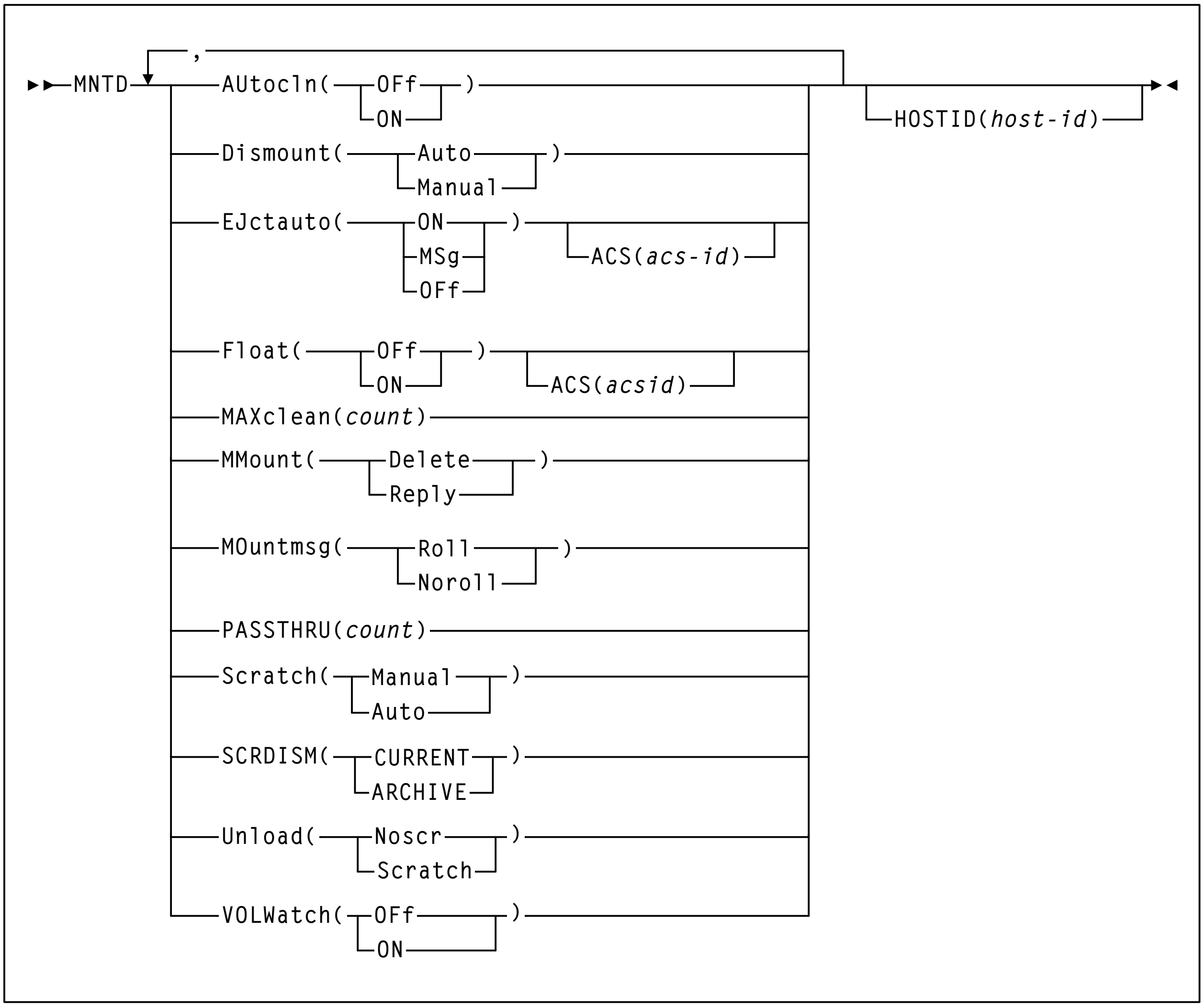
- enable/disable the HSC automated cleaning function
- automatic or manual deletion of volumes from the control data set for a manual mode LSM
- automatic ejection of cleaning cartridges
- HSC cell selection for dismounted volumes that require pass-thru operations to be mounted (i.e., in a new cell or the original cell before the dismount)
- setting the maximum number of times a cleaning cartridge is used
- retaining manually mounted volumes in the control data set until dismount
- rolling mount messages off the operator console screen
- setting the maximum number of pass-thrus allowed for cartridge archival
- setting automatic archival of scratch volumes upon dismount
- automatic or manual selection of scratch volumes in a manual mode LSM
- overriding the DELDISP for a volume command and allowing the volume to be scratched or kept
- notification by the HSC when a library volume is requested for a mount on a nonlibrary device.

MNTD can be specified by an operator as an operator command or by a systems programmer as a PARMLIB control statement.

Notes:

- The specified option remains in effect for the designated host until it is changed by another MNTD command, or until the HSC is shutdown and restarted.
- Use the Display MNTD command to display the current MNTD options (refer to “Display MNTD” on page 100 for details on command syntax and parameters).
- If any MNTD parameters are entered more than once, only the last occurrence applies.
- On a single MNTD command, if the ACS subparameter is entered for more than one parameter (i.e., EJctauto and Float), the ACS setting applies to both parameters.

Syntax



Command Name

MNTD
initiates the MNTD command or control statement.

Parameters

AUtocln
controls automated transport cleaning.

OFf
disables the automated cleaning function. OFf is the initial value for the HSC.

ON
enables the following HSC cleaning functions:

- the automated cleaning function, which detects when a transport requires cleaning and schedules the mount of a cleaning cartridge prior to the next volume mount
- the CLean command which is used to schedule the mount of a cleaning cartridge for a specified transport. (refer to “CLEAN Command” on page 51 for details on command syntax and parameters).

Dismount

specifies whether volumes are to be deleted automatically from the control data set when a dismount is requested in a manual mode LSM for a volume that was mounted by the robot before the LSM was modified offline.

Auto

indicates that volumes are to be automatically deleted from the control data set when a manual dismount is requested for a volume that was mounted by the robot. Auto is the initial value for the HSC.

Manual

directs the HSC to issue a message prompting the operator to decide whether the volume is to be deleted from the control data set when a manual dismount is requested for a volume that was mounted by the robot.

Setting Dismount to Manual is useful when an LSM is modified offline for only a short time. In this case, the operator can choose to **not** respond to the dismount message and leave the volume mounted on the transport. When the LSM is modified online the HSC re-drives the outstanding dismount request, causing the robot to dismount the volume and place it in a storage cell.

EJctauto

controls automatic ejection of cleaning cartridges that have exceeded their maximum use.

In a multi-host environment, the EJctauto setting for a given ACS should be the same on all hosts. EJctauto status is not shared among the HSCs on different hosts.

ON

directs the HSC to automatically eject cleaning cartridges that have exceeded the number of times they can be used (as specified by the MNTD MAXclean or VOLATTR MAXclean parameters). ON is the initial value for the HSC.

MSg

directs the HSC to prompt the operator to either eject an over use-limit cartridge from the ACS or to keep a cleaning cartridge in the ACS.

OFf

directs the HSC to keep an over use-limit cleaning cartridge in the ACS. A message is issued displaying the cleaning cartridge’s volser and describing this action.

ACS

optionally, specifies that the EJctauto settings apply only to the specified ACS. If this parameter is omitted, EJctauto settings affect all ACSs.

acsid

indicates a hexadecimal value from 00 to FF that identifies the ACS. A single digit *acsid* can be entered.

Float

specifies whether the HSC is to select a new home cell location when it dismounts a volume that required a pass-thru when it was mounted.

In multi-host environments, the Float setting for a specific ACS should be the same on all hosts. Float status is not shared among the HSCs on different hosts.

ON

directs the HSC to select a new home cell location for the volume in the LSM where the dismount occurs (provided a cell is available). If no cells are available in the new LSM, a location is chosen in the nearest LSM with free cells, or the volume can be forced to its original home cell. Setting Float to ON reduces the number of pass-thru operations. ON is the initial value for the HSC.

OFf

directs the HSC to return the volume to its original home cell location when it is dismounted.

Note: The MNTD Float OFf command is useful for remote ACS/CDS link down situations to avoid control data set integrity issues by making sure cartridges are returned to their original home cell locations. Refer to ‘‘Remote-linked Library Configurations’’ in the *HSC System Programmer’s Guide* for information on remote libraries.

ACS

optionally, specifies that the Float setting applies only to this ACS. If the ACS parameter is omitted, the Float setting affects all ACSs.

acsid

indicates a hexadecimal value from 00 to FF that identifies the ACS. A single digit acsid can be entered.

MAXclean
specifies the maximum number of times a cleaning cartridge is to be used.

Notes:

- The **EJctauto** setting in effect for the ACS controls how cleaning cartridges are handled when they exceed their maximum use.
- In a multi-host environment, the **MAXclean** setting should be the same on all hosts. The **MAXclean** value is not shared among the HSCs on different hosts.
- Follow the cartridge vendor's recommendations for the number of times a cleaning cartridge should be used.

count
a decimal value, in the range from 1 through 32767. The initial value for the HSC is 100.

Notes:

- The *count value* applies to each cleaning cartridge in the library.
- When a cleaning cartridge is used *count* number of times, it is not selected if there are cleaning cartridges compatible with the transports in the ACS that have been used less than *count* number of times. Over use-limit cleaning cartridges may be automatically ejected, depending on the MNTD EJctauto setting.

MMount
specifies whether or not a mount message is issued during manual mode that allows the operator to retain a manually mounted volume in the control data set.

Delete
generates a manual mode mount message which prompts the operator to respond ‘‘D’’ to delete the volume from the control data set, or ‘‘I’’ to ignore the mount request. Delete is the initial value of the HSC.

Reply
generates a manual mode mount message which prompts the operator to reply ‘‘M’’ to DOM the message and retain the volume in the control data set, or ‘‘I’’ to ignore the mount request.

Note: When MNTD MMount(Reply) is specified, the HSC action for a manual mode dismount is determined by the MNTD Dismount setting.

MOuntmsg

specifies whether mount messages handled by the HSC are allowed to roll off the operator console screen before the mount requests are satisfied.

Roll

indicates that mount messages are allowed to roll off the console screen before the mount requests are satisfied. Roll is the initial value for the HSC.

Note: Rolling of specific mount messages (EX: TMS007) can be limited by presetting that message's *xxxx*RCDC (Request to Change Descriptor Codes) flag within flag word *xxxx*RFB1. A sample MPF USEREXIT to preset the *xxxx*RCDC flag can be found in the SAMPLIB.

Noroll

indicates that mount messages are to remain on the console screen until the mount requests are satisfied.

PASSTHRU

specifies the maximum number of pass-thrus that can occur to allow cartridge archival if SCRDISM(ARCHIVE) is specified.

count

indicates the maximum number of pass-thrus allowed for archival of cartridges. Allowable values are decimal in the range from 1 through 99. The initial value of the HSC is 1.

Scratch

determines how a scratch volume is selected to satisfy a scratch mount request for a manual mode LSM.

Manual

specifies that the operator must select a scratch volume when a scratch mount is requested for a manual mode LSM. Manual is the initial value for the HSC.

Auto

directs the HSC to select a scratch volume when a scratch mount is requested for a manual mode LSM. If Scratch is set to Auto, the HSC manual mount message indicates the cartridge VOLSER and cell location as if it were a request for a specific volume.

SCRDISM

specifies whether or not scratch volumes mounted in a 9310 or 9360 LSM are to be automatically archived to a larger or slower LSM upon dismount.

Note: 9740 LSMs cannot attach to any other type of LSM. Thus, SCRDISM does not affect mounts in ACSs containing 9740s.

CURRENT

indicates that scratch volumes mounted in a 9310 or 9360 LSM are to be dismounted according to the MNTD Float parameter setting. CURRENT is the initial value for the HSC.

ARCHIVE

indicates that scratch volumes mounted in a 9310 or 9360 LSM are to be archived into a larger or slower storage device. Archival occurs only if the number of pass-thrus does not exceed PASSTHRU. Archival of a cartridge can occur.

- from a 9360 to either a 9310 or a 4410
- from a 9310 to a 4410.

Notes:

- SCRDISM(ARCHIVE) overrides the MNTD Float parameter setting.
- The ARCHIVE parameter does not affect dismounts in ACSs containing 9740 LSMs.

Unload

specifies whether a volume that is unloaded and dismounted is scratched or kept. The delete disposition (DELDISP) is used if this parameter is not specified. DELDISP is specified in the SLILIBRY macro in LIBGEN (see ‘‘SLILIBRY Macro’’ in the *HSC Installation Guide*).

Noscr

indicates that the volume is to be kept in non-scratch status after the dismount.

Scratch

indicates that the volume is to be placed in scratch status after the dismount.

VOLWatch
specifies whether or not the HSC issues a message when a library volume is requested for a mount on a nonlibrary device.

OFf
indicates that the HSC is not to issue a message when a library volume is requested for a mount on a nonlibrary device. OFf is the initial value for the HSC.

ON
directs the HSC to issue a console message when a library volume is requested for a mount on a nonlibrary device. The message identifies the VOLSER that must be ejected from the library to satisfy the mount.

HOSTID
used in PARMLIB control statements to identify the host associated with the MNTD command. This allows you to restrict certain startup options to a specific host.

If this parameter is not specified, the command is executed by each host that accesses PARMLIB.

host-id
is the host ID.

Note: If the *host-id* does not match the host executing the command, a message is issued and the command is not processed.

Examples

The following examples illustrate the use of the MNTD command and control statement.

Enable Automatic Tape Transport Cleaning for This Host

```
MNTD AUTOCLN(ON)
```

To have the HSC issue a message when a manual dismount is requested by this host for a volume that was mounted by the robot, the following example applies. The command takes effect only when the LSM is in manual mode.

Set Dismount Processing to Manual

```
MNTD DISMOUNT(MANUAL)
```

To return a volume to its original home cell when it is dismounted, after a mount which required a pass-thru from one LSM to another, the following example applies for ACS 01.

Pass Dismounted Cartridge Back to Original Home Cell in ACS 01

```
MNTD FLOAT(OFF) ACS(Ø1)
```

To generate a manual mount message that allows the operator to reply ‘‘M’’ and retain the volume in the control data set following example applies. The command takes effect only when the LSM is in manual mode.

Generate Manual Mount Message to Retain Cartridge in CDS

```
MNTD MMOUNT(REPLY)
```

To have scratch volumes that are mounted in a 9310 or 9360 LSM archived in a larger or slower LSM, and set a maximum number of two pass-thrus allowed to archive the cartridges, following example applies.

Archive Scratch Cartridges in a Larger or Slower LSM

```
MNTD SCRDISM(ARCHIVE),PASSTHRU(2)
```

To have the HSC issue a message when a mount is requested for a library volume on a nonlibrary transport, the following example applies.

Issue a Message for a Mount on a Nonlibrary Transport

```
MNTD VOLW(ON)
```

Specifying Multiple Mount/Dismount Options for Host HSC1

```
MNTD AU(ON),F(OF),MAX(2ØØ),VOLW(ON),HOSTID(HSC1)
```

MODIFY Command

The MODify command performs these functions:

- to start dynamic hardware reconfiguration for a SL3000 or a SL8500 library
- to modify a CAP or an LSM online or offline to all hosts, independent of the issuing host.

Starting Dynamic Hardware Configuration

Dynamic hardware reconfiguration for the SL3000 and SL8500 libraries represents the portion of Near Continuous Operation (NCO) that allows you to dynamically add or delete drives, expansion panels.

Enter the MODify CONFIG command to activate dynamic hardware reconfiguration. Refer to Appendix C, "Near Continuous Operation (NCO), in the *HSC System Programmer's Guide* for more information.

Warning: BEFORE you enter MODify CONFIG, **RUN A BACKUP OF THE CDS**.

Additional Considerations

- **Do not** run the Vary command from the SLConsole (SLC) when the HSC is active. Varying LSMs offline through the SLC places the affected LSMs in a NOT READY state, which can lead to disrupted library operations. Instead, when you want to modify an LSM OFFLINE, run the MODify command.

- It is possible to remove LSMs from the SL8500 configuration without performing a LIBGEN, MERGEcds, and recycle of the HSC. However, **this operation requires assistance from StorageTek**.

- If you intend to add drives, run the SET SLIDRIVS utility to allow the HSC to recognize drive locations and associated UCB addresses and to ensure the CDS reflects the new tape drive configuration. Refer to the SET SLIDRIVS utility in the *HSC System Programmer's Guide.*

Caution: StorageTek recommends that you do not run CDS-related commands and utilities while dynamic hardware changes are being implemented.

Modifying CAPs/LSMs Offline or Online

Modifying a CAP offline causes it to be placed into an unavailable state, preventing it from being allocated. This command can be used when a hardware problem occurs on a CAP, to prevent the CAP from being used without modifying the entire LSM offline. The command will fail if the CAP is busy.

Modifying an LSM offline stops any new automated cartridge handling operations from being initiated while allowing current activity to terminate normally. When all active requests have been processed, the HSC issues a console message to inform the operator that the LSM is offline. An offline LSM is placed in manual mode; that is, the operator must enter the LSM and manually mount/dismount tapes as required.

Caution: StorageTek strongly recommends that you do not place SL3000 and SL8500 libraries in manual mode. To use manual mode, all LSMs in the SL3000 and SL8500 must be offline, and that means all CAPs and drives are unavailable for automated operations. Additionally, SL3000 and SL8500 libraries have been designed for high cartridge density, so there is limited room for manually mounting and dismounting cartridges.

Refer to the “Precautions” topic in the *SL3000* or *SL8500 Modular Library System User’s Guide* for safety requirements and physical restrictions if you decide that you must enter the library.

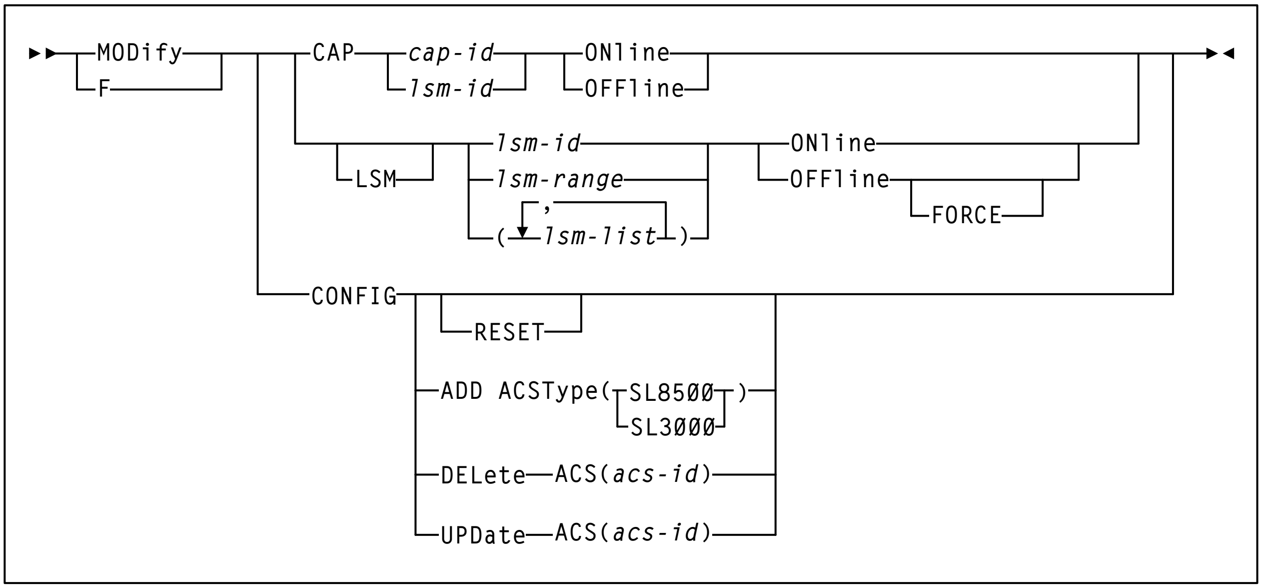
The MODify LSM OFFline FORCE command stops current activity in the LSM immediately. All outstanding requests to this LSM are purged, and an initial program load (IPL) process may need to be run on the LSM.

Note: In-transit cartridges may become errant when an LSM is forced offline. Refer to “Recovering Errant Cartridges” on page 349 for errant cartridge recovery procedures.

The MODify command differs from the Vary command in the following ways:

- The MODify command places a specified CAP or LSM online/offline globally to all hosts.
  - A CAP that is modified offline cannot be used for eject/enter processing.
  - An LSM that is modified offline must be operated in manual mode.
  - A manual mode LSM is still available for diagnostic requests from a host.
- The Vary command places a host station online/offline to an LMU.
  - A host that has all of its LMU stations varied offline is disconnected from all LSMs attached to the LMU.
  - An LSM can still be used to semi-automate cartridge handling for a disconnected host by issuing HSC commands from a connected host.

Syntax



Command Name

MODify or F

initiates the MODify command.

Parameters

CAP

specifies that a CAP is to be modified online/offline to all hosts.

cap-id

identifies a specific CAP to be modified online/offline. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid (*AA* is hexadecimal 00-FF; *LL* is hexadecimal 00-17), and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

☞ **Notes:**

- If you enter this parameter when there is more than one CAP in the specified LSM, an error message is generated.
- If SL3000 library CAPs are not present, the HSC reports them as “not installed.” This keeps CAP addresses from changing as new CAPs are added.
- Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.
- SL3000 and SL8500 libraries do not contain a PCAP.

lsm-id

Caution: Be sure you specify the CAP parameter to modify a CAP offline. If the LSM is online, and you specify an *lsm-id* to modify the CAP offline but do not specify the CAP parameter, the LSM will be modified offline.

An *lsm-id* identifies a standard CAP to be modified online/offline. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

ONline

specifies that the CAP is to be modified online to all hosts. When a CAP is modified online, the HSC attempts to restore the CAP mode (automatic or manual) that was in effect when the CAP was modified offline.

OFFline

specifies that the CAP is to be modified offline to all hosts.

Caution: Use this command only in an emergency. Make sure the CAP is not being used by another active process. Issuing the MODify command on an active CAP may cause the process using the CAP to receive errors.

Modifying a CAP offline places it in an unavailable state, preventing it from being allocated. The CAP mode (automatic or manual) is retained in the control data set.

LSM

optionally indicates that one or more LSMs are to be modified online/offline to all hosts.

Note: The LSM parameter is optional for HSC 2.0 but may be a required parameter in future releases.

lsm-id or ***lsm-range*** or ***lsm-list***

identifies one or more LSMs to be modified online/offline to all hosts. Each *lsm-list* element may be either a single LSMid or an LSMid range. The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

ONline

specifies that the LSMs are to be modified online to all hosts. Modifying an LSM online places it in automatic mode. When an LSM is modified online, CAPs that were in auto mode before the LSM was modified offline are again placed in auto mode (unlocked state).

OFFline

specifies that the LSMs are to be modified offline to all hosts. Modifying an LSM offline places it in manual mode. CAPs in a manual mode LSM cannot be used, but the auto/manual state of each CAP is retained.

FORCE

specifies that the LSM(s) is to be modified offline immediately. FORCE is only used with the OFFline parameter to modify an LSM offline.

CONFIG

initiates the Near Continuous Operation (NCO) for hardware reconfiguration process for SL3000 and SL8500 libraries. This is a system-wide change that propagates to all hosts connected to the CDS.

Note: Refer to Appendix C, "Near Continuous Operation," in the *HSC System Programmer's Guide* for more information about dynamic hardware reconfiguration.

ADD

initiates an NCO configuration change to add one ACS to the HSC configuration. The ACS added takes on the library characteristics of the library type specified by the **ACSType** parameter. The number of ACSs that can be added is limited by the number specified on the SLILIBRY FUTRACS parameter.

ACSType

specifies the library type to use for the configuration change. Options are **SL3000** or **SL8500**.

DELete

initiates an NCO configuration change to delete the disconnected ACS specified in the **ACS(*acs-id*)** parameter.

If the ACSid is the highest numbered ACS, the ACS is entirely deleted and can be re-added as a different ACSType. If the ACSid is **not** the highest numbered ACS, the ACS becomes a place holder with a status of unallocated and can be re-added only as the same ACSType.

RESET

resets internal flags for any host that may be failing as a hardware configuration is being performed. When the failing host comes back up, the new hardware configuration is automatically recognized and implemented.

A reset is intended only to reset a failing host and does not initiate the actual dynamic hardware reconfiguration operation. The MODify CONFIG command, without the RESET parameter, must be run separately to invoke dynamic hardware reconfiguration.

UPDate

initiates an NCO configuration change to update the ACS configuration specified in the **ACS(*acs-id*)** parameter. This is not a system wide change and does not propagate to other hosts connected to the CDS. If a system wide update is needed, enter the MODify CONFIG command minus any additional parameters.

Note: The ADD and DELete parameters are only valid if the SLILIBRY FUTRACS parameter was specified during the LIBGEN process.

Examples

The following examples illustrate the use of the MODify command.

Modify CAP 00:01:01 Online

```
MODIFY CAP 00:01:01 ONLINE
```

Modify LSMs 00:02 and 00:03 Offline

```
MODIFY LSM (00:02,00:03) OFFLINE
```

Modify LSM 00:01 Online

```
MOD 00:01 ON
```

Modify LSM 00:01 Offline Immediately

```
F 00:01 OFF FORCE
```

Initiate Hardware Reconfiguration

```
MOD CONFIG
```

Add a new SL3000 ACS

```
MOD CONFIG ADD ACST(SL3ØØØ)
```

Add a new SL8500 ACS

```
MOD CONFIG ADD ACST(SL85ØØ)
```

Delete ACS 01

```
MOD CONFIG DELete ACS(Ø1)
```

Update ACS 01 configuration

```
MOD CONFIG UPDate ACS(Ø1)
```

MONITOR Command

The MONITOR command initiates monitoring of cartridge move requests received from the programmatic interface. Requests that can be monitored include MOUNT, DISMOUNT, MOVE, and EJECT. The output messages can be recorded in the hardcopy log, or displayed on a designated console, or both.

Notes:

- Use the STOPMN command to terminate monitoring (refer to “Stop Monitoring (STOPMN) Command” on page 214 for details on command syntax and parameters).
- Use the Display MONitor command to display the current monitoring operations (refer to “Display MONitor” on page 101 for details on command syntax and parameters).

Syntax

```
►►─┬─MONITOR─┬──PGMI──┬──────────────────┬──────────────────────────────►◄
   └─MN──────┘        └─,L(─┬───────┬─)─┘
                            ├─cc────┤
                            └─name──┘
```

Command Name

MONITOR or **MN**
initiates the MONITOR command.

Parameters

PGMI
specifies that cartridge move requests from the programmatic interface are to be monitored.

L
identifies the console where the monitoring information is to be displayed. If this parameter is omitted, or is specified without a console ID or console name, the information is displayed on the console that issued the command.

cc
specifies the console ID. Allowable values are decimal in the range from 00 through 99.

If you specify 00, the information is sent only to the hardcopy log. This may cause duplicated entries in the hardcopy log.

name
specifies the console name.

Examples

The following examples illustrate the use of the MONITOR command.

To monitor volume move requests from the programmatic interface and display the information on this console, the following example applies.

Monitor Volume Move Requests Using This Console

```
MONITOR PGMI
```

To monitor volume move requests from the programmatic interface and display the information on console ID 51, the following example applies.

Monitor Volume Move Requests Using Console ID 51

```
MN PGMI,L=51
```

To monitor volume move requests from the programmatic interface and send the information only to the hardcopy log, the following example applies.

Monitor Volume Move Requests Sending the Information to the Log

```
MONITOR PGMI,L=00
```

MOUNT Command

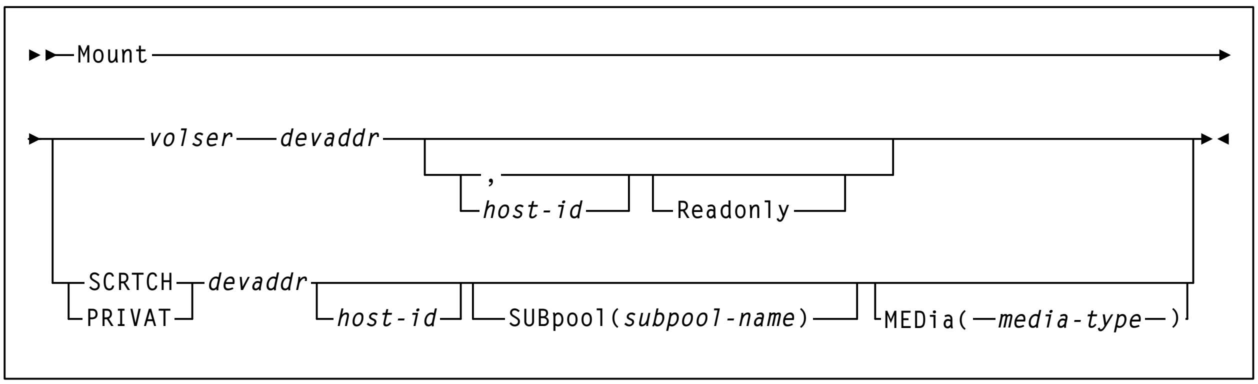
Caution: The Mount command always positions the tape at load point.

The Mount command directs the robot to mount a volume onto a specified library-controlled transport. Using this command you can:

- mount either a specific volume or a scratch volume
- mount a scratch volume from a specified scratch subpool
- redrive a mount request that was lost by the HSC (because of an LMU IPL, for example)
- use the virtual thumbwheel feature to write-protect a volume by specifying the Readonly parameter
- semi-automate mounts for a disconnected host, in a multi-host environment, by issuing the Mount command from a connected host.

If MEDia is not entered, the next available scratch is mounted that is compatible with the specified *devaddr.*

Syntax



Command Name

Mount
initiates the Mount command.

Parameters

volser
specifies the volume to be mounted.

devaddr
specifies the device address of the transport on which to mount the volume.

host-id

indicates that the volume is to be mounted on the device address defined to the specified host.

Readonly

indicates that the volume is to be mounted for read-only access.

If you do **not** supply a *host-id* and do specify Readonly, a comma must be entered immediately before **Readonly** to indicate the missing operand. For example:

```
MOUNT 123456 ØBØ,,READONLY
```

SCRTCH

specifies a scratch volume is to be mounted.

PRIVAT

specifies a scratch volume is to be mounted.

devaddr

specifies the device address of the transport on which to mount the volume.

host-id

indicates that the volume is to be mounted on the device address defined to the specified host.

SUBpool

indicates the scratch volume is to be taken from a scratch subpool. If this parameter is not specified, the system mounts a scratch volume from subpool 0, which contains all scratch tapes in the ACS including scratch tapes in named subpools.

Refer to “Scratch Subpool Control Statement” in the *HSC System Programmer’s Guide* for information on defining scratch subpools.

subpool-name

is the name of the subpool from which the scratch volume is to be taken.

Note: Scratch subpool names are specified with the SCRPOol control statement. Refer to ‘‘HSC Control Statements’’ in the *HSC System Programmer’s Guide* for information on the SCRPOol control statement.

MEDia

optionally, specifies the type of media for the scratch volume. The specified media must be compatible with the requested *devaddr*.

Notes:

- If **MEDia** is not specified, the next scratch cartridge is selected without regard to media type.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type

identifies the media type. Valid media types are:

LONGItud

indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C (HELical) cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C). DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B), 40GB (T9840C), or 75GB (T9840D).

STK2

indicates any T9940 cartridge.

STK2P

indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P). STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

T10000T1 or **T1**

indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. T10000T1 can be abbreviated as **T1**.

T10000TS or **TS**

indicates a smaller-capacity 120GB T10000A or 240GB T10000B cartridge. T10000TS can be abbreviated as **TS**.

T10000T2 or **T2**

indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**

indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

Examples

The following examples illustrate the use of the Mount command.

Mount a Scratch Volume on Device B04 Defined to This Host

```
MOUNT SCRTCH BØ4
```

Mount VOLSER 016288 on Device Address 585

```
M Ø16288 585
```

Mount VOLSER EDU027 on Device Address 0B0

```
M EDUØ27 ØBØ MVS1
```

Mount VOLSER EDU076 on Device 0B0 Allowing Read-Only Access

```
M EDUØ76 ØBØ,,READONLY
```

Mount a Scratch Volume From Subpool SIGHT1 on Device address B04

```
M SCRTCH BØ4 SUB(SIGHT1)
```

Mount a Scratch Volume From Default Subpool on Device B04

```
M SCRTCH BØ4
```

Mount an STD Scratch Volume on Devaddr C90

```
MOUNT SCRTCH C9Ø MEDIA(STD)
```

Mount an SD-3 Scratch Volume on Devaddr C91

```
MOUNT SCRTCH C91 MED(DD3A)
```

MOVE Command

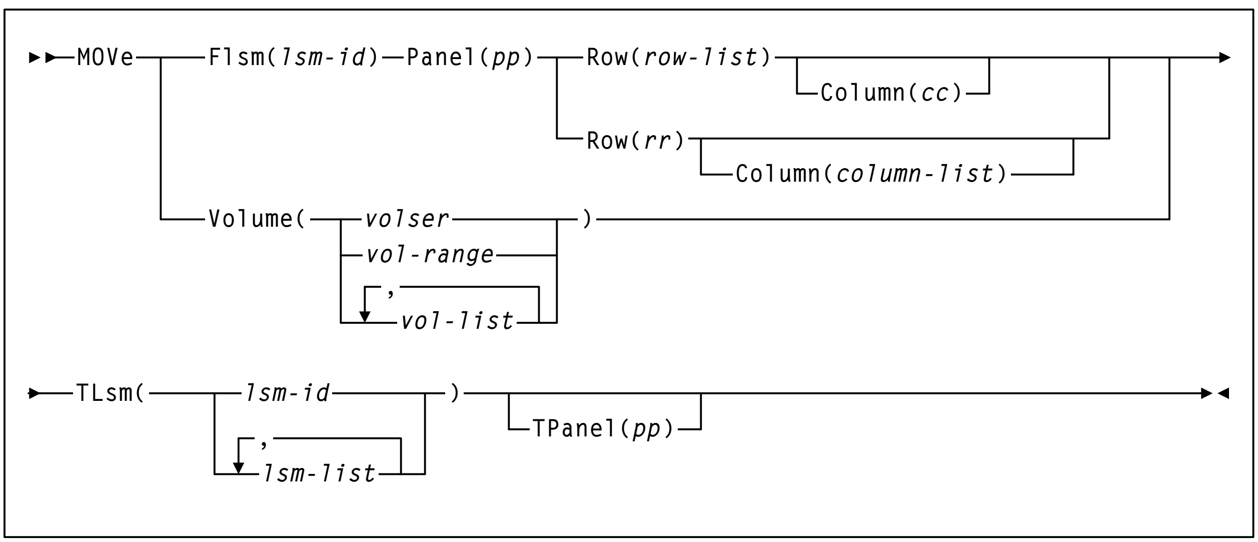
The MOVe command directs the robot to move cartridges to selected destinations within the same LSM, or to any other LSM within an ACS. Cartridges can be moved to allow better control over tape activity, or to prepare for hardware changes (for example, adding a cartridge drive to an LSM).

You can identify the cartridges to be moved by location (LSM, panel, row, column), or by VOLSERs. The command accepts a single VOLSER, a range of VOLSERs, or a list of VOLSERs. A maximum of 300 volumes can be moved with one MOVe command.

Notes:

- Movement between cells in the same panel is prohibited.
- If every available cell in the destination location is filled before all specified cartridges are moved, the command terminates. The HSC issues a console message to inform the operator that there are no more ''free cells available'' at the specified destination.
- A frozen panel cannot be the target of a move. Cartridges will not be moved to frozen panels in a target LSM.

Syntax



Command Name

MOVe
initiates the MOVe command.

Parameters

Flsm

specifies the ‘‘from’’ LSM; that is, the LSM where the cartridges are currently being stored. This parameter is used to move volumes by location.

lsm-id

identifies the “from” LSMid. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

Only one *lsm-id* can be specified.

☞ **Note:** The Flsm parameter and the Volume parameter cannot be specified in the same command.

Panel

identifies the panel containing the cartridges to be moved. This parameter is required when the Flsm parameter is specified.

☞ **Note:** Ranges and lists of panels are not valid.

pp

is the panel number. Allowable values for *pp* are decimal and are specific to the LSM type:

- LSM Models 4410 and 9310 PowderHorn
  - 0-11 for outer wall panels
  - 12-19 for inner wall panels.
- LSM Model 9360 WolfCreek
  - 0-2 for Model 9360-050
  - 0-3 for Model 9360-075
  - 0-4 for Model 9360-100.
- LSM Model 9740 TimberWolf
  - 0-2 (panel 3 is included if the optional cells are present).
- LSM Model SL3000 StreamLine Library
  - Access Expansion Module (AEM required) - panels 0-1 and 22-23 are located on both ends of the library
  - Base Drive Module (BDM required) - panels 12-13
  - Drive Expansion Module (DEM optional) - panels 10-11 are located left of the BDM
  - Cartridge Expansion Module (CEM optional) panels 2-9 are located left of the BDM or optional DEM.

- Cartridge Expansion Module (CEM optional) panels 14 -21 are located right of the BDM.
- Parking Expansion Module (PEM) - **Dual Robots only** - panel numbers equate to the same panel numbers of the CEM it replaces, depending on its location right or left of the BDM.

Note: The SL3000 library has static panels numbers starting with the left-most back panel (panel 0) and ending with the right-most front panel (panel 23) on a fully-configured library. The panel numbering starts with the BDM (panels 12 and 13), the only required module, and works outward to the left and to the right.

- LSM Model SL8500 StreamLine
  - base library — 2-10
  - With one expansion panel — 2-18 (expansion panel is 8-15)
  - With two expansion panels — 2-26 (expansion panels are 8-23)
  - With three expansion panels — 2-34 (expansion panels are 8-31).

Row

identifies one or more rows containing the cartridges to be moved. This parameter is required when the Flsm parameter is specified.

Note: Ranges of rows are not valid.

rr

is the row number. Allowable values for *rr* and *row-list* are decimal and are specific to the LSM type:

- LSM Models 4410 and 9310 PowderHorn
  - 0-14 for outer wall panels
  - 0-5 and 8-14 for inner wall panels.
  - The maximum list is 4 rows (approximately 100 cells).
- LSM Model 9360 WolfCreek - 0-41 (all models). The maximum list is 20 rows (approximately 100 cells).
- LSM Model 9740 TimberWolf - 0-41 on panels 0, 2, and 3; and 36-41 on panel 1.

Notes:

- Column 3 on panel 2 allows row entries only on rows 28-41.
- The cells on panel 3 are optional.

- LSM Model SL3000 StreamLine Library
  - Access Expansion Modules - panels 0-1 and 22-23 (no cells in this initial release)
  - Base Drive Module (BDM) - panel 12 (back)
    12-47 with 8 drives installed
    23-47 with 16 drives installed
    35-47 with 24 drives installed
  - Base Drive Module (BDM) - panel 13 (front)
    0-51 on the front panel
  - Drive Expansion Module (DEM) - panel 10 (back)
    12-47 available with 8 drives installed
    23-47 available with 16 drives installed
    35-47 available with 24 drives installed
    No rows available with 32 drives installed
  - Drive Expansion Module (DEM) - panel 11 (front)
    0-51 available on the front panel
  - Cartridge Expansion Modules (CEM) - all panels
    0-51 available on both front and back panels
  - Parking Expansion Module (PEM) - all panels
    0-51 available on the back and front panels
- LSM Model SL8500 StreamLine
  - 0-26 on a standard panel
  - 0-12 on a short panel (panels 4, 6-7)
  - 6-12 on a PTP panel (panel 5)

Row/Column Parameter Restrictions:

- A list of rows **cannot** be specified if a list of columns is specified.
- A list of columns **cannot** be specified if a list of rows is specified.

Column

identifies one or more columns containing cartridges to be moved. This parameter is optional. If not specified, then all the columns will be moved for the designated rows.

Note: Ranges of columns are not valid.

cc

is the column number. Allowable values for *cc* and *column-list* are decimal and are specific to the LSM type:

- LSM Models 4410 and 9310 PowderHorn
  - 0-23 for outer wall panels
  - 0-19 for inner wall panels.

- LSM Model 9360 WolfCreek - 0-5 (all models).
- LSM Model 9740 TimberWolf - 0-3 for panels 0, 2, and 3 (if the optional cells are present); 0-2 for panel 1.
- LSM Model SL3000 StreamLine Library
    - Access Expansion Module (AEM) panels 0-1 and 22-23
    - Base Drive Module (BDM) - panel 12 (back)
      0 is available, if a CEM or DEM is added to the left of the BDM
      1-5 available for rows 12-47 with 8 drives installed
      1-5 available for rows 23-47 with 16 drives installed
      1-5 available for rows 35-47 with 24 drives installed.
    - Base Drive Module (BDM) - panel 13 (front)
      0 available with expansion to the left of the BDM
      5 available for rows 39-51 with expansion to the right of the BDM
      1-3 available for rows 0-38 with a CAP installed
      1-4 available for rows 39-51 with a CAP installed
      1-3 not available for rows 9-16 with optional window/Operator panel installed.
    - Drive Expansion Module (DEM) - panel 10 (back)
      0 is available with expansion to the left of the DEM
      1-5 available for rows 12-47 with 8 drives installed
      1-5 available for rows 23-47 with 16 drives installed
      1-5 available for rows 35-47 with 24 drives installed
      No columns available with 32 drives installed.
    - Drive Expansion Module (DEM) - panel 11 (front)
      0 available with expansion to the left DEM
      1-3 available for rows 0-38 with a CAP installed
      1-5 available for rows 39-51, with a CAP installed
      1-3 not available for rows 9-16 with a window installed
      1-5 available for rows 0-51 on a standard DEM panel.
    - Cartridge Expansion Module (CEM) - panels 2, 4, 6, 8 (back)
      0 available with expansion to the left
      1- 5 available on the standard CEM back panel.
    - Cartridge Expansion Module (CEM) - panels 3, 5, 7, 9 (front)
      0 available with expansion to the left
      1-3 available for rows 0-38 with a CAP installed
      1-4 available for rows 39-51, with a CAP installed
      1-4 available on the standard CEM front panel.
    - Cartridge Expansion Module (CEM) - panels 14, 16, 18, 20 (back)
      0-5 available on the standard CEM back panel.

- Cartridge Expansion Module (CEM) - panels 15, 17, 19, 21 (front)
  0-3 available for rows 0-38 with a CAP installed
  0-5 available for rows 39-51 with a CAP installed
  0-5 available on the standard CEM front panel.

- Parking Expansion Module (PEM) - left side PEM
  3-5 available on the back and front panels with a second robot installed.

- Parking Expansion Module (PEM) - right side PEM
  0-2 available on the back and front panels with a second robot installed.

- LSM Model SL8500 StreamLine - 0-1 for all panel types.

Row/Column Parameter Restrictions:

- A list of rows **cannot** be specified if a list of columns is specified.
- A list of columns **cannot** be specified if a list of rows is specified.

☞ **Note:** All SL3000 columns are numbered 0-5 (left to right).

Volume

specifies up to 300 volumes to be moved. This parameter is used to move specific volumes regardless of their location within an LSM.

volser or ***vol-range*** or ***vol-list***

identifies a single VOLSER, a VOLSER range, or a list of VOLSERs in any combination.

☞ **Note:** The Flsm parameter and the Volume parameter cannot be specified in the same command.

TLsm

identifies up to sixteen ‘‘to’’ LSMs; that is, the destination LSMs where the cartridges are being moved. This parameter is required.

If more than one TLsm is specified, the cell locations in the first LSM listed are filled, then the cells in the second LSM listed, and so forth, until either all designated cartridges have been moved, or all designated cells are filled. The ‘‘from’’ LSM (Flsm) can be included in the TLsm list.

☞ **Note:** Ranges of TLsms are not valid.

lsm-id or ***lsm-list***

identifies one or more “to” LSMids. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

LSMid Conditions:

- All TLsm *lsm-ids* must contain the same ACSid.
- If the Flsm parameter is specified, the TLsm *lsm-ids* must specify the same ACSid as the Flsm parameter.
- If the Volume parameter is specified, the TLsm *lsm-ids* must be in the same ACS as the specified volumes.

TPanel

identifies the panel where the cartridges are to be moved. This parameter is optional.

Note: Ranges and lists of TPanels are not valid.

pp

is the panel number. Allowable values for *pp* are decimal and are specific to the LSM type:

- LSM Models 4410 and 9310 PowderHorn
  - 0-11 for outer wall panels
  - 12-19 for inner wall panels.
- LSM Model 9360 WolfCreek
  - 0-2 for Model 9360-050
  - 0-3 for Model 9360-075
  - 0-4 for Model 9360-100.
  - LSM Model 9740 TimberWolf
  - 0-2 (panel 3 is included if the optional cells are present).
- LSM Model 9740 TimberWolf
  - 0-2 (panel 3 is included if the optional cells are present).
- LSM Model SL3000 StreamLine Library
  - Base Drive Module (BDM required) - panels 12-13
  - Drive Expansion Module (DEM optional) - panels 10-11 are located left of the BDM.
  - Cartridge Expansion Module (CEM optional) - panels 2-9 are located left of the BDM or optional DEM
  - Cartridge Expansion Module (CEM optional) - panels 14-21 are located right of the BDM
  - Parking Expansion Module (PEM) - **Dual Robots only** - The panel number (front and back) equates to the same panel number of the CEM it replaces, depending on its location right or left of the BDM.

Note: The SL3000 library has static panels numbers starting with the left-most back panel (panel 0) and ending with the right-most front panel (panel 23) on a fully-configured library. The panel numbering starts with the BDM (panels 12 and 13), the only required module, and works outward to the left and to the right.

- LSM Model SL8500 StreamLine
  - base library — 2-10
  - With one expansion panel — 2-18 (expansion panel is 8-15)
  - With two expansion panels — 2-26 (expansion panels are 8-23)
  - With three expansion panels — 2-34 (expansion panels are 8-31).

Examples

The following examples illustrate the use of the MOVe command.

Move the Cartridges in LSM 00:01, Panel 9, Rows 2-4 to LSM 00:00

```
MOVE FLSM(00:01) PANEL(9) ROW(2,3,4) TLSM(00:00)
```

Move VOLSERs 123456 and 111000-111032 to Panel 18 in LSM 00:00

```
MOV V(123456,111000-111032) TL(00:00) TP(18)
```

Move Cartridges in WolfCreek LSM 00:00, Panel 2, Row 28 to LSM 00:01

```
MOVE FLSM(00:00) PANEL(2) ROW(28) TLSM(00:01)
```

OPTION Command and Control Statement

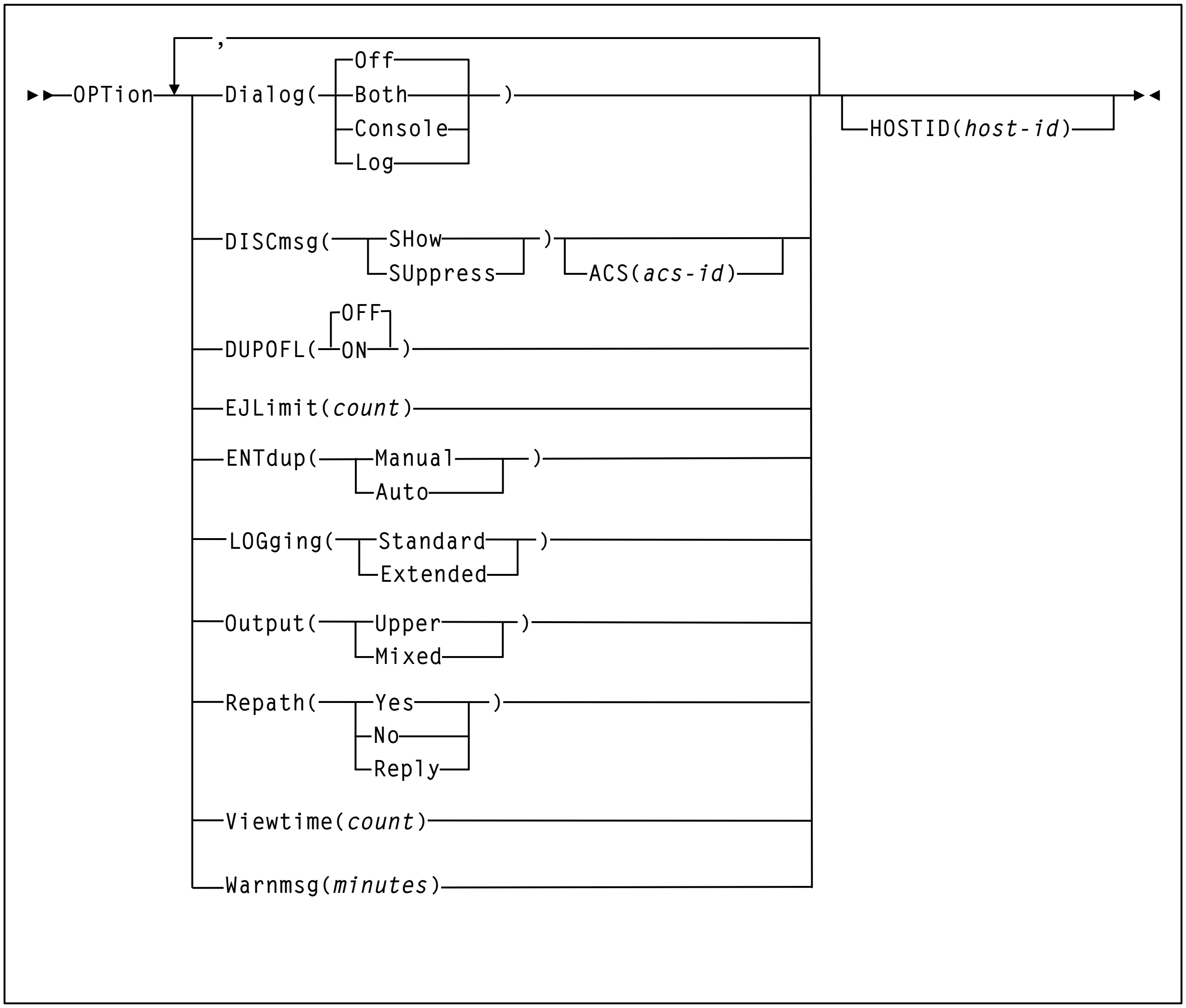
The OPTion command and control statement is used to set or change the following general purpose options of the HSC:

- whether HSC messages are written to the operator console and/or system log during HSC termination
- suppressing the "ACS acs-id is disconnected" (SLS1664A) message.
- allowing the duplicate VOLSER process to continue when the VOLSER being entered into the CAP shows in the CDS that it exists in an ACS that is disconnected or in an LSM that is offline.
- the maximum number of cartridges that are allowed to be specified on the EJect command
- whether or not the HSC prompts the operator when an enter operation finds a duplicate VOLSER in the control data set but cannot locate the cartridge in the ACS
- recording HSC robotics movement and soft fail data.
- uppercase or mixed case character output for messages displayed on the console
- how the HSC processes volumes associated with a specific CAP for an eject operation, when the CAP becomes unavailable before the eject completes
- the viewing time permitted during the VIew command. Refer to "VIEW Command" on page 229 for details on command syntax and parameters.
- the duration between scratch depletion warning messages.

OPTion can be specified by an operator as an operator command or by a systems programmer as a PARMLIB control statement.

Note:
Use the Display OPTion command to display the current OPTion settings (refer to "Display OPTion" on page 102 for details on command syntax and parameters).

Syntax



Command Name

OPTion

initiates the OPTion command or control statement.

Parameters

Dialog

allows HSC messages to be written to the operator console and/or the system log. These messages indicate that the HSC is waiting for an active task to complete before the HSC terminates. The initial Dialog value is set by the EXEC statement during HSC startup.

Both

specifies that messages are written to the system log and the operator console. **Both** is the default value for the HSC if the Dialog parameter is not specified on the EXEC statement.

Log

specifies that messages are written to the system log only.

Console

specifies that messages are written to the operator console only.

Off

specifies that messages are not to be written.

DISCmsg

specifies whether or not the ‘‘ACS *acs-id* is disconnected’’ message (SLS1664A) is displayed for the specified ACS.

This option is useful when an ACS has been added to the LIBGEN in advance to provide for future expansion. Entering DISCmsg allows the user to turn off the display for those ACSs that will not be connected until later.

SHow

Displays the ‘‘ACS *acs-id* is disconnected’’ message (SLS1664A) for an ACS. This is the initial value.

SUppress

Suppresses the ‘‘ACS *acs-id* is disconnected’’ message (SLS1664A) for an ACS.

ACS

optionally, specifies the ACS for which the command applies. If ACS is not specified, the DISCmsg setting entered (**Show** or **Suppress**) applies to all ACSs.

acs-id

indicates the hexadecimal ACSid value (00-FF).

If **ACS** is not specified, all ACSs are affected.

DUPOFL

allows the duplicate VOLSER process to continue when the VOLSER being entered into the CAP shows in the CDS that it exists in an ACS that is disconnected or in an LSM that is offline.

OFF

disables the duplicate VOLSER process. This is the default.

ON

EJLimit

indicates the maximum number of cartridges that can be specified on one EJect command.

count

specifies the limit. Allowable values are 1 through 9999. The initial value for the HSC is 100.

ENTdup

specifies whether the HSC prompts the operator when an enter operation finds a duplicate VOLSER in the control data set, but cannot locate the cartridge in the ACS.

When someone attempts to enter a cartridge with a VOLSER that duplicates an entry in the control data set, the HSC attempts to locate the original cartridge.

The ENTdup option determines how the HSC responds when the cartridge

- is not in its home cell,
- is not selected, and
- is not errant.

Auto

instructs the HSC to delete the cartridge in the control data set and allow the enter to continue.

Manual

instructs the HSC to issue a console message when a duplicate VOLSER is entered. The message prompts the operator to decide whether the HSC should delete the cartridge in the control data set and allow the enter to continue, or eject the duplicate cartridge. **Manual** is the initial value for the HSC.

Output

specifies whether the output messages are displayed on the console in uppercase or mixed case.

Upper

specifies uppercase. **Upper** is the initial value for the HSC.

Mixed

specifies mixed case.

Repath

determines how the HSC processes volumes associated with a specific CAP for an EJect command, when the CAP is drained or becomes unavailable before the eject operation completes.

Yes

automatically causes the unavailable CAP's volumes to be associated with another CAP running under the same EJect command. **Yes** is the initial value for the HSC.

No

causes failure messages to be generated for volumes associated with the unavailable CAP. The EJect command continues processing the next volume.

Reply

generates a message which prompts the operator to determine how the volumes are processed. The operator must respond either ''Y'' or ''N,'' where

Y

causes the unavailable CAP's volumes to be associated with another CAP running under the same EJect command.

N

causes failure messages to be generated for volumes associated to the unavailable CAP. The EJect command continues processing the next volume.

Viewtime

specifies the length of time in seconds the system is to hold an LSM camera in one location when the VIew command is issued (refer to "VIEW Command" on page 229 for details on command syntax and parameters).

count

is the number of seconds. Allowable values for count are decimal in the range from 5 through 120. The initial value for the HSC is 10 seconds.

Notes:

- The VIew command allows the user to override the OPTion Viewtime setting for a single viewing operation.
- An SMF record (subtype 8) is written when the VIew command is issued to document robot activity.

Warnmsg

sets the number of minutes between scratch depletion messages.

minutes

specifies the number of minutes. Allowable values for minutes are 1 through 65535. The initial value is 5 minutes.

HOSTID

used in PARMLIB control statements to identify the host associated with the OPTion command. This allows you to restrict certain startup options to a specific host.

If this parameter is not specified, the command options are applied to each host that accesses PARMLIB.

host-id

is the host identifier.

Note: If the *host-id* does not match the host executing the command, a message is issued and the command is not processed.

Examples

The following examples illustrate the use of the OPTion command and control statement.

To change the default viewing time on this host to twenty seconds when the VIew command is issued, the following example applies.

Change Viewing Time to 20 Seconds

```
OPTION VIEWTIME(20)
```

To instruct the HSC to issue a console message when someone attempts to enter a duplicate VOLSER into an LSM and the original cartridge cannot be located, the following example applies.

Prompt the Operator for Duplicate VOLSERs

```
OPT ENT(MANUAL)
```

Write HSC Messages to System Log During HSC Termination

```
OPT DIALOG(LOG)
```

Set a Maximum Limit of 250 Cartridges Allowed for EJect Command

```
OPT EJLIMIT(250)
```

Instruct HSC to Display Messages in Mixed Case

```
OPT O(M)
```

Specifying Multiple Options in PARMLIB for Host HSC0

```
OPT ENT(M),O(M),V(5),HOSTID(HSCØ)
```

Set the Scratch Depletion Warning Message Interval

```
OPT WARNMSG(1Ø)
```

RECOVER Host Command

The RECover command allows the operator to recover the resources owned by a host that becomes inoperable. Cross-host recovery frees library resources that are owned by the failing host, and transfers that ownership to the recovering host. These resources include CAPs, which can be activated by only one host at a time, and volumes, which are assigned to a particular host while moving or mounting.

Syntax

```
►►─RECover──host-id─┬───────┬──────────────────────────────────────►◄
                    └─FORCE─┘
```

Command Name

RECover
initiates the RECover command.

Parameters

host-id
identifies the host for which to perform recovery.

FORCE
FORCE indicates that recovery is to be performed for the specified host even if the HSC has not detected that the host is inactive. This allows recovery of a host when the active flag for that host is still on.

Caution: Use the FORCE operand with great caution. Make sure the specified host is inactive before specifying this operand.

Forced recovery of an active host requires that the HSC on that host be recycled. All database activity is prohibited on the recovered host, which can cause unexpected abends when tape activity occurs, or when the HSC is recycled on that host.

Examples

The following examples illustrate the use of the RECover command.

Recover the Resources That Are Currently Owned By Host HSC1

```
RECOVER HSC)
```

Forcibly Recover the Resources That Are Owned By Host HSC2

```
REC HSC2 FORCE
```

RELease CAP Command

Caution: Use this command as a last resort. Make sure the CAP is not being used by another active process. Issuing the RELease command on an active CAP may cause the process using the CAP to receive errors.

The RELease command is used to free an allocated CAP making it available for other processes. A CAP can be left allocated to a host if the HSC on that host terminated without performing recovery while the CAP was active. The RELease command enables the operator to make the CAP available again without requiring a recycle of all HSCs sharing the control data set.

The command can be issued from any connected host. The operator is required to confirm the release operation by responding to a console message.

Syntax

```
►►─RELease──cap-id──────────────────────────────────────────────────────►◄
```

Command Name

RELease
initiates the RELease command.

Parameters

cap-id
identifies the CAP to be released. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid, and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13-cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13-cell removable magazines.

0B

- For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

Notes:

- If SL3000 library CAPs are not present, the HSC reports them as "not installed." This keeps CAP addresses from changing as new CAPs are added.
- Refer to "How to Specify a CAPid" on page 29 for a complete explanation of CAPid formats
- SL3000 and SL8500 libraries do not contain a PCAP.

Example

The following example illustrates the use of the RELease command and the operator intervention required to release CAPid 001:00.

Release CAPid 00:01:00

```
REL 00:01:00
... RELEASE CAP 00:01:00 REQUESTED: REPLY N TO CANCEL, OR Y TO CONTINUE

Y
```

SCRAtch Command

The SCRAtch command allows you to scratch a volume, a list of volumes, or a range of volumes. SCRAtch is supported by the UUI interface, which provides plain text, structured XML, and comma separated values (CSV) output formats. See “UUI Command Support” on page 37 for more information.

Syntax

```
                     ┌─,────────┐
►►─SCRAtch──VOLser(──▼─vol-list─┴──)──────────────────────────────────►◄
```

Command Name

SCRAtch
initiates the SCRAtch command.

Parameters

VOLser
specifies the list of volume serial numbers to be added to the scratch list(s).

(vol-list)
vol-list specifies the volume serial numbers; this can be a single volume, a list of volume serial numbers, ranges of volume serial numbers, or combinations of lists with ranges delimited by commas. The entire list must be enclosed in parentheses.

The maximum number of volume serial numbers that can be specified is 100.

Example

The following example illustrates the use of the SCRAtch command.

```
SCRATCH VOLSER(A1B1C1,A1B1C3)
SCRATCH VOLSER(A1B1C4-A1B1C6)
SCRATCH VOLSER(A2B1C1,A2B1C4,A2B1C6-A2B1C9)
```

SENTER Command

The SENter command is used to schedule an enter on a CAP that is currently allocated to an eject operation. Up to a full CAP of cartridges can be entered when the CAP becomes available. The SENter command must be issued from the host that has the CAP allocated for ejecting cartridges.

When the HSC message instructs you to empty the CAP:

1. Open the CAP.
2. Remove the ejected cartridges.
3. Place the cartridges to be entered into the CAP.
4. Close the CAP.

Note: Drive enters (i.e., from a CAP to a transport) are not supported.

Syntax

```
►►─SENter───────cap-id──────────────────────────────────────────────────────►◄
```

Command Name

SENter
initiates the SENter command.

Parameters

cap-id
specifies the CAP to use to enter the cartridge. One CAP must be specified and it must be allocated to the host issuing the SENter command.

The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid, and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP
- For SL3000 LSMs, this is a left-side AEM CAP, consisting of 18, 13-cell removable magazines
- For SL8500 LSMs, the CAP consists of 3, 13-cell removable magazines.

01

- For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines
- For SL8500 LSMs, this is an optional CAP consisting of 3, 13-cell removable magazines.

02

- priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP
- For SL3000 LSMs, this is an optional CEM CAP consisting of 2, 13-cell removable magazines.

03, 04, 05

- For SL3000 LSMs, these are optional CEM/DEM CAPs consisting of 2, 13-cell removable magazines.

06

- For SL3000 LSMs, this is the only required BDM CAP consisting of 2, 13 cell removable magazines.

07, 08, 09, 0A

- For SL3000 LSMs, these are optional CEM CAPs consisting of 2, 13 cell removable magazines.

0B

For SL3000 LSMs, this is a right-side AEM CAP, consisting of 18, 13-cell removable magazines

☞ **Note:**

- If SL3000 library CAPs are not present, the HSC reports them as "not installed." This keeps CAP addresses from changing as new CAPs are added.
- Refer to "How to Specify a CAPid" on page 29 for a complete explanation of CAPid formats
- SL8500 and SL3000 libraries do not contain a PCAP.

Examples

The following examples illustrate the use of the SENter command to enter cartridges using a CAP that is performing enter processing.

Enter Cartridges Into a Standard CAP (CAPid 00:00)

```
SEN 00:00
```

Enter Cartridges Into an LSM With Multiple CAPs (LSMid 00:01)

```
SEN 00:01:00
```

SRVlev (Service Level) Command

The SRVlev command is used to specify the service level at which the HSC operates. The HSC subsystem can operate at either of two service levels: BASE or FULL.

The BASE service level is the nucleus of the HSC subsystem. It provides the functions that are necessary to run the subsystem, but not the robotics. This includes the ability to issue HSC commands, execute certain utilities, access the control data set, support the operating system interfaces and front-ends, and sustain HSC host-to-host communications. All HSC commands can be issued in the BASE service level, but the commands which involve library hardware have partial or no functionality.

Note: Table 2 on page 39 identifies which commands can be executed at the BASE service level.

The FULL service level includes the remaining functions necessary to sustain basic library operations. These functions are mount/dismount, CAP processing, cartridge and cell inventory management, LMU access, and library resource recovery. The FULL service level also supports all utilities.

Note: Use the Display SRVlev command to display the current service level (refer to "Display SRVlev" on page 118 for details on command syntax and parameters).

Syntax

```
►►─SRVlev──┬─BASE─┬───────────────────────────────────────────────────►◄
           └─FULL─┘
```

Command Name

SRVlev
initiates the SRVlev command.

Parameters

BASE
specifies that the HSC is to operate at the BASE service level.

Note: When the HSC service level drops to BASE, host-to-host communications using the LMU method are switched to the CDS method. When the HSC FULL service level is restored, you must issue the COMMPath command to return to LMU communications.

FULL
specifies that the HSC is to operate at the FULL service level.

Note: When the HSC service level is brought from BASE up to FULL, outstanding mount requests are resolved.

Example

The following example illustrates the use of the SRVlev command to bring the HSC to the FULL service level.

Operate the HSC at the FULL Service Level

```
SRV FULL
```

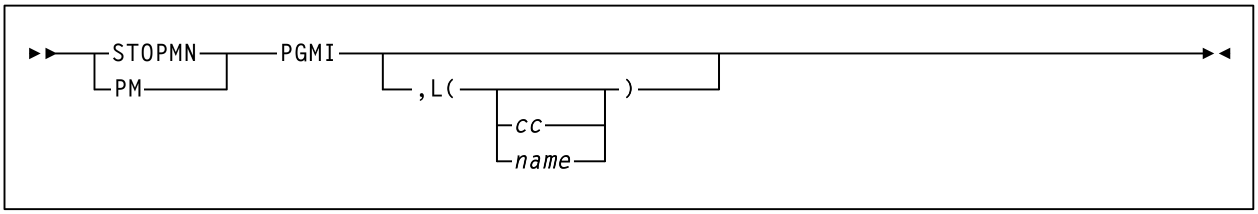
Stop Monitoring (STOPMN) Command

The STOPMN command terminates monitoring of cartridge move requests received from the programmatic interface.

Notes:

- Use the MONITOR command to initiate monitoring (refer to "MONITOR Command" on page 182 for details on command syntax and parameters).
- Use the Display MONitor command to display the current monitoring operations (refer to "Display MONitor" on page 101 for details on command syntax and parameters).

Syntax



Command Name

STOPMN or PM
initiates the STOPMN command.

Parameters

PGMI
specifies that monitoring of cartridge move requests from the programmatic interface is to be terminated.

L

identifies the console where the monitoring information is being displayed. If this parameter is omitted or if L= is specified without a console ID or console name, the monitoring being displayed on the console that issued the command is terminated.

cc
specifies the console ID. Allowable values are decimal in the range from 00 through 99.

Specifying 00 stops information from being sent explicitly to the hardcopy log.

name
specifies the console name.

Examples

The following examples illustrate the use of the STOPMN command.

To terminate monitoring of volume move requests from the programmatic interface that is being displayed on this console, the following example applies.

Stop Monitoring on this Console

```
STOPMN PGMI
```

To terminate monitoring of volume move requests from the programmatic interface that is being displayed on console ID 51, the following example applies.

Stop Monitoring on Console ID 51

```
PM PGMI,L=51
```

To terminate the information about monitoring of volume move requests from the programmatic interface from being sent to the hardcopy log, the following example applies.

Stop Sending Monitoring Information to the Hardcopy Log

```
STOPMN PGMI,L=ØØ
```

SWITCH Command

The SWitch command can be used to *manually* reverse the roles of the master and standby LMUs or Library Controllers (LCs). The following configurations support switching:

- dual LMU
- SL8500 dual Library Controller (LC).

In a dual LMU environment, this command initiates an IPL in the master LMU, causing the current standby LMU to become the master LMU. If the former master LMU completes the IPL successfully, it then assumes the role of the standby LMU.

In a dual LC configuration for a multiple SL8500 library ACS, the SWitch command issues a request to the LMU to switch the library LCs by library ID.

Caution: Issue the Display Acs command (see page 65) **BEFORE you enter the SWitch command** to ensure the library to switch includes an assigned TCP/IP address or host name for the standby. **If it does not, DO NOT switch the library because doing so causes the HSC to lose communication with the library.**

Notes:

- **For this release, only the SL8500 library is supported for dual LC switching.**
- For an *automatic* switch to occur (for example, from LCA to LCB or visa versa), the LC must fail. In this case, if there is a network/communication problem with LCA, the HSC goes into network recovery for the LCA connection(s). If you cannot recover or fix the connection, issue the SWitch command to switch LCA to LCB manually.
- Before you issue the SWitch command, if the library is partitioned, be aware of other host software groups (ACSLS, HSC, ELS) using other partitions in the same library.

Syntax

```
►►─SWitch──┬──────────────────┬───────────────┬──────────────────┬──────────►◄
           └─Acs acs-id(1)────┘               └─LIBrary lib-id───┘
```

Note:

(1) ACS *acs-id* is optional in a single-ACS environment; it is required in a multiple-ACS environment.

Command Name

SWitch
initiates the SWitch command.

Parameters

Acs

indicates that an ACSid is being specified. **This parameter is required for a multiple-ACS configuration, or if an** *acs-id* **is specified.**

acs-id

identifies the ACS that must switch the current active connection as standby and bring the standby connection online as active.

Notes:

- In a single ACS configuration, Acs *acs-id* is optional and defaults to ACS 00.
- If the *acs-id* defaults to 00 or is specified with no other parameters, then all of the ACS's active connections are switched to standby, and the standby connections are switched to active.

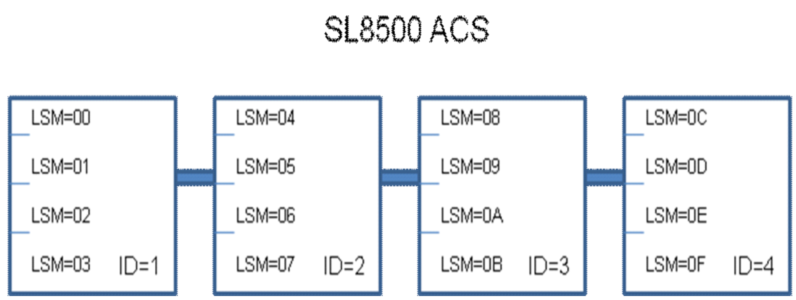
LIBrary

specifies the SL8500 library ID for the connection switch. **This parameter applies only to the SL8500 library.**

lib-id

specifies the library ID from 1-9 or A-G.

For an SL8500 four library ACS cluster, each library is assigned an ID from 1 to 4, as shown below.



An ACS can have up to 16 library connections with A and B Library Controller (LC) connections. For the initial release, only one library (preferred to be ID 1) can have A and B LC connections. The other libraries can have a single LC connection. Of course, each LC can handle dual TCP/IP (2B and 2A). Table 5 shows the LSM ID correlation to Library ID:

Table 5. Library ID/LSM ID Assocation

Library ID	LSM ID Range	Library ID	LSM ID Range
1	00-03	9	20-23
2	04-07	A	24-27
3	08-0B	B	28-2B
4	0C-0F	C	2C-2F
5	10-13	D	30-33
6	14-17	E	34-37
7	18-1B	F	38-3B
8	1C-1F	G	3C-3F

Examples

The following examples illustrate the use of the SWitch command

Switch Control of ACS 00 to the Standby LMU

```
SW ACS 00
```

Switch Control of ACS 00 to the Standby Library

```
SWITCH ACS 00 LIB 1
```

TRACE Command

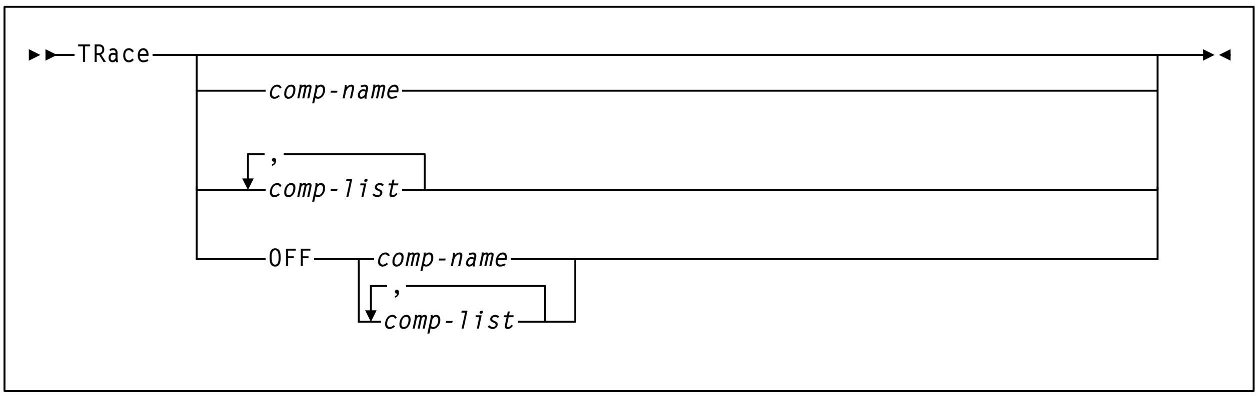
The TRace command enables or disables tracing of events for selected HSC components. The SCP TRACE facility is used to perform the tracing.

The SCP TRACE command must have the “USR” event enabled for any trace output to result.

Notes:

- Refer to “Problem Determination, Diagnostics, and Recovery” in the *HSC System Programmer’s Guide* for information about HSC GTRACE USR record formats.
- TRace is supported by the UUI interface, which provides plain text, structured XML, and comma separated values (CSV) output formats. See the *NCS/VTCS XML Guide* for more information.

Syntax



Command Name

TRace
initiates the TRace command. If you do not specify any other parameters, the status of all component tracing is displayed.

Parameters

OFF
turns off tracing for the specified component(s).

comp-name or ***comp-list***
specifies one or more HSC components for which tracing is to be enabled or disabled. If a list of component names is specified, separate the identifiers with blank spaces or commas.

Notes:

- When tracing is enabled or disabled for one or more HSC components, the status of all component tracing is displayed.
- To trace the Recovery component, you must also trace the SERvice component (a service is used to trace Recovery).

Valid component names are listed below; uppercase letters denote the minimum abbreviations allowed.

ALloc	allocation volume lookup
CAp	CAP common
COnfigur	configuration control
Database	database server
FP	function points
HComm	host communications
Initiali	initialization
Lmu	LMU server
Mount	mount/dismount
Operator	operator commands
Recovery	recovery (Note: must also trace SERvice)
SERvice	services
Utilitie	utilities
UUI	Unified User Interface
Volume	volume/cell
VTcs	VTCS
Wto	WTO server
XMl	XML interface (MVS only)

Examples

The following examples illustrate the use of the TRace command and provide sample outputs.

Display the Status of All HSC Component Tracing

```
TRACE

Sample Output

...  Current TRACE Status: xxx
ALLOC                NOT Traced
CAP                  NOT Traced
CONFIGURATION        NOT Traced
DATABASE             NOT Traced
INIT/TERM            NOT Traced
LMU DRIVER           NOT Traced
MOUNT/DISMOUNT       NOT Traced
OPERATOR             NOT Traced
RECOVERY             NOT Traced
UTILITIES            NOT Traced
VOLUME/CELL          NOT Traced
WTO SERVER           NOT Traced
XML                  NOT Traced

HOST COMMUNICATIONS NOT Traced
```

Trace the Allocation and Host Communications Components

```
TRACE ALLOCATI HCOMM

Sample Output

...  Current TRACE Status: xxx
ALLOC                NOT Traced
CAP                  NOT Traced
CONFIGURATION        NOT Traced
DATABASE             NOT Traced
INIT/TERM            NOT Traced
LMU DRIVER           NOT Traced
MOUNT/DISMOUNT       NOT Traced
OPERATOR             NOT Traced
RECOVERY             NOT Traced
UTILITIES            NOT Traced
VOLUME/CELL          NOT Traced
WTO SERVER           NOT Traced
XML                  NOT Traced

HOST COMMUNICATIONS Traced
```

Turn Off Tracing for Host Communications Component

```
TR OFF HCOMM

Sample Output

...  Current TRACE Status: xxx
ALLOC               NOT Traced
CAP                 NOT Traced
CONFIGURATION       NOT Traced
DATABASE            NOT Traced
INIT/TERM           NOT Traced
LMU DRIVER          NOT Traced
MOUNT/DISMOUNT      NOT Traced
OPERATOR            NOT Traced
RECOVERY            NOT Traced
UTILITIES           NOT Traced
VOLUME/CELL         NOT Traced
WTO SERVER          NOT Traced
XML                 NOT Traced

HOST COMMUNICATIONS NOT Traced
```

TRACELKP Command

The TRACELKP command enables or disables tracing of LOOKUP events associated with HSC definition files. The GTF GTRACE facility is used to perform the tracing.

To create GTF output for the event, GTF must be started before the HSC TRACELKP command is issued.

Note: Refer to “Generalized Trace Facility in the HSC System Programmer’s Guide for information about using the Generalized Trace Facility (GTF) Tracing (GTRACE).

Syntax

```
►►─TRACELKP──┬────────────────────┬──────────────────────────────────►◄
             ├─table-name─────────┤
             │ ┌─,──────────┐     │
             ├─▼─table-list─┴─────┤
             └─OFF──table-name────┘
```

Command Name

TRACELKP
initiates the TRACELKP command. If you do not specify any other parameters, the status of all event tracing is displayed.

Parameters

OFF
turns off tracing for the specified component(s).

table-name or ***table-list***
specifies one or more LOOKUP definition files for which tracing is to be enabled or disabled. If a list of event names is specified, separate the identifiers with blank spaces or commas.

Notes:

- When LOOKUP tracing is enabled or disabled for one or more files, the status of all LOOKUP tracing is displayed.
- All LOOKUP tracing output goes to GTF.

Valid LOOKUP table names are listed below; uppercase letters denote the minimum abbreviations allowed.

TAPEREQ	TAPEREQ (TREQDEF) table
VOLATTR	VOLATTR (VOLDEF) table
UNITATTR	UNITATTR (UNITDEF) table
LMUPATH	LMUPATH (LMUPDEF) table
MVCPOOL	MVCPOOL (MVSPDEF) table
MGMTCLAS	MGMTCLAS (MGMTDEF) table
STORCLAS	STORCLAS (STORDEF) table
LOOKFAIL*	Trace the LOOKUP failures in detail

* If LOOKFAIL is specified, the detail failure trace records are output for all events that are ON.

Examples

The following examples illustrate the use of the TRACELKP command.

```
TRACELKP table-name
```

```
TRACELKP OFF
```

UNSCRatch Command

The UNSCRatch command allows you to unscratch a volume, a list of volumes, or a range of volumes. UNSCRatch is supported by the UUI interface, which provides plain text, structured XML, and comma separated values (CSV) output formats. See “UUI Command Support” on page 37 for more information.

Syntax

```
              ┌─,────────┐
►►──UNSCRatch──VOLser(──▼─vol-list─┴──)──────────────────►◄
```

Command Name

UNSCRatch
initiates the UNSCRatch command.

Parameters

VOLser
specifies the list of volume serial numbers to be deleted from the scratch list(s).

(vol-list)
vol-list specifies the volume serial numbers; this can be a single volume, a list of volume serial numbers, ranges of volume serial numbers, or combinations of lists with ranges delimited by commas. The entire list must be enclosed in parentheses.

The maximum number of volume serial numbers that can be specified is 100.

Example

The following example illustrates the use of the UNSCRatch command.

```
UNSCRATCH VOLSER(A3B1C1,A3B1C3)
UNSCRATCH VOLSER(A3B1C4-A3B1C6)
UNSCRATCH VOLSER(A4B1C1,A4B1C4,A4B1C6-A4B1C9)
```

VARY Station Command

The Vary command places the specified ACSs or stations online, offline, or standby to the HSC from which the command is issued.

In an ACS, a connection between the host CPU and an LMU is referred to as a ‘‘station.’’ Each station appears to the host CPU as a 3278-2 device and is physically connected to a port on a supported 3174, 3274 or compatible terminal controller. Each LMU can contain a maximum of 16 stations. Depending on the number of host CPUs connected to the ACS, each host CPU can have either one or several stations to each LMU.

The online state causes the host software to allocate and use the connection (terminal controller port) of the specified ACSs or stations for sending work to the LMU. When an ACS is varied online, any offline stations are varied online, and connection definitions are automatically refreshed. Then, if the user executes the SET SLISTATN utility and cycles the HSC, the new configuration takes effect.

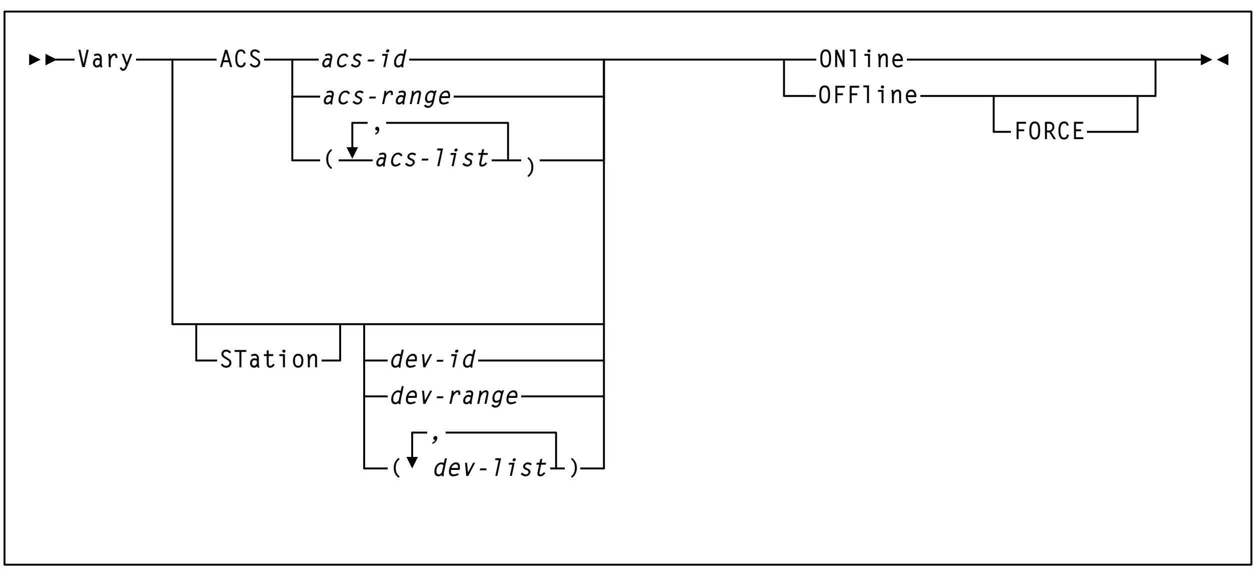
The standby state means that the specified ACSs or stations are available only for limited communication with the standby LMU and will not be used for robotics, cartridge movement, or library status requests.

The offline state causes the host software to stop using and then to deallocate the device connection for the specified ACSs or stations. When an ACS is varied offline, the HSC purges all outstanding requests.

The Vary command has an optional parameter to force the offline state immediately. When the last station between the host and the ACS is forced offline, all outstanding requests are purged. The ACS-to-HSC is now in disconnected mode.

Note: To get a station online or offline to VM, issue the CP VARY command.

Synax



Command Name

Vary

initiates the Vary command.

Parameters

ACS

specifies the ACS to be made online, offline, or standby to this host.

acs-id or ***acs-range*** or ***acs-list***

identifies one or more ACSs to be varied. Each *acs-list* element can be either a single ACSid or an ACSid range. Ranges are separated by a dash. The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

STation

optionally, specifies the stations to be made online, offline, or standby to this host.

dev-id or ***dev-range*** or ***dev-list***

identifies the stations to an LMU to be varied. Each *dev-list* element can be either a single device number or a range of device numbers. Ranges are separated by a dash.The elements in a list must be separated by commas or blanks, and the entire list must be enclosed in parentheses.

Each device number identifies a device attached to the host issuing the command. Allowable values are 000 through FFF.

ONline

specifies that the stations are to be made online or standby to this host.

OFFline

specifies that the stations are to be made offline to this host.

FORCE

optionally, indicates that the stations are to be made offline immediately. The FORCE option can be specified when the HSC is at the full service level or is past the base service level going to the full service level.

This parameter applies only to the OFFline operand.

Examples

The following examples illustrate the use of the Vary command.

Vary Station 028, 029, 030, and 032 Online

```
VARY STATION (Ø28-Ø3Ø,Ø32) ONLINE
```

Vary Station 028 Offline Immediately

```
V Ø28 OFFLINE FORCE
```

Vary ACSs 01 through 03 Online

```
V ACS Ø1-Ø3 ON
```

VIEW Command

If video monitors are attached to the LSM, the VIew command enables the operator to visually inspect internal components of the LSM, using the robot's cameras.

Notes:

- **The VIew command is not supported for the SL8500 library, which does not contain lights or cameras.**
- The VIew command requires exclusive use of the robot. This command impacts library performance because the robot is not available for other work while it is viewing a component.
- An SMF record is written each time the VIew command is issued (if subtype 8 is specified in PARMLIB) to document robot activity.

The following components can be viewed using this command:

- CAP cells
- cartridge storage and diagnostic cells
- drives
- playground cells
- pass-thru port (PTP) cells.

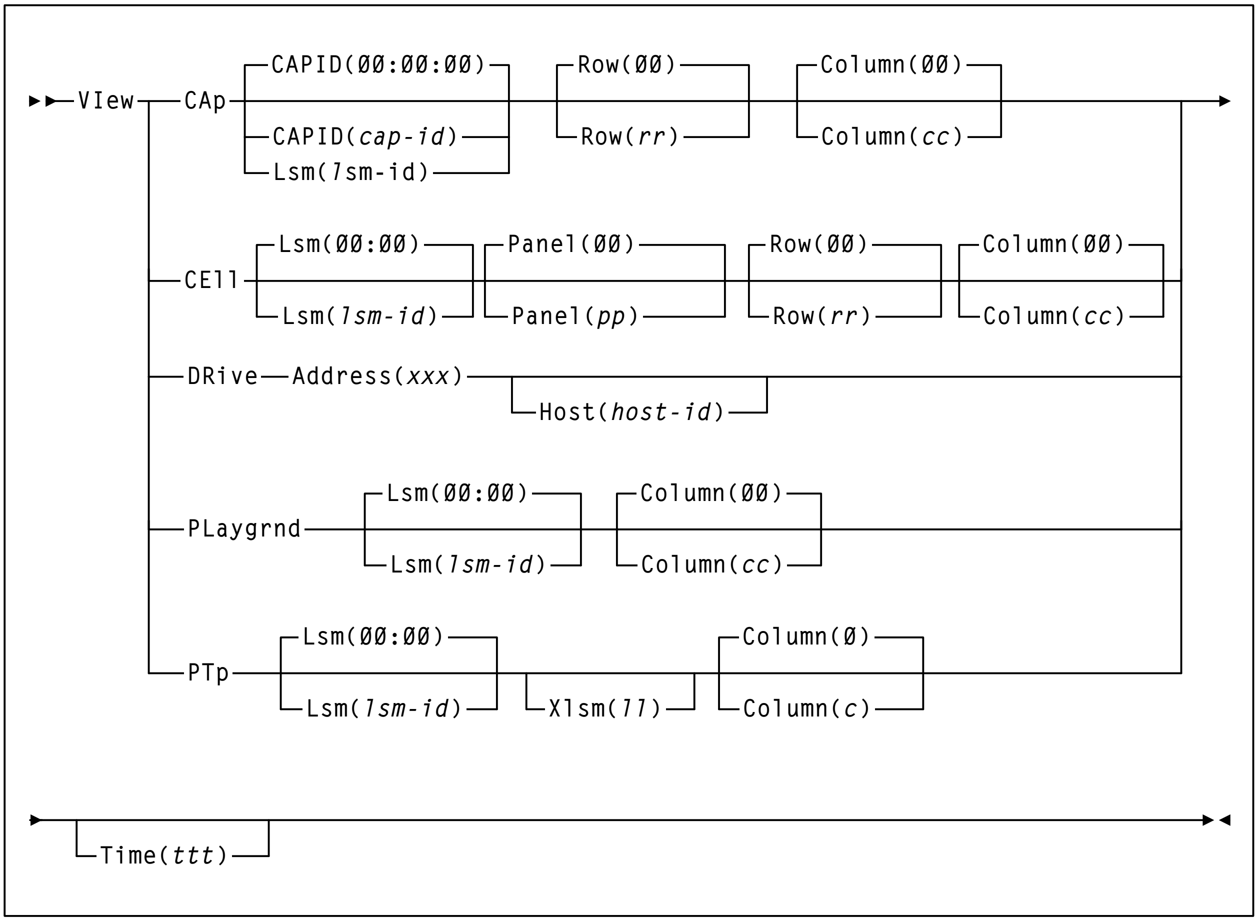
Note: StorageTek does not provide video monitors that can be attached to an LSM. Each LSM is equipped with ports which allow third-party video monitors to be connected to the robot's vision system.

An HSC message is displayed on the system console when the robot is in position to view the specified component. This notifies the operator that the camera is ready, and provides the following information about the component being viewed:

- ACSid
- LSM number
- camera number
- number of seconds the camera is to remain focused
- component name
- component location.

The message remains highlighted on the console until either the time interval expires, or the operator responds to the message. The operator is not required to respond to the message, but by doing so, can cancel the VIew command and resume normal operations.

Syntax



Command Name

VIew

initiates the VIew command.

Parameters

CAp

indicates that a camera is to focus on a cell location in a CAP. If you do not specify the CAPID or Lsm parameter, the command defaults to CAPid 00:00:00. If you do not specify the Row and Column parameters, the command defaults to row 0, column 0.

CAPID

identifies one CAP in an LSM that contains multiple CAPs.

cap-id cap-id

specifies the CAP you want to view. The format of a *cap-id* is *AA:LL:CC*, where *AA:LL* is the LSMid (*AA* is hexadecimal 00-FF; *LL* is hexadecimal 00-17), and *CC* is one of the following:

00

- For 4410 and 9310 LSMs, standard 21-cell CAP or the right-hand 40-cell enhanced CAP
- For 9740 LSMs, fixed rack 14-cell or 10-cell removable magazine CAP

01

For 4410 and 9310 LSMs, left-hand 40-cell enhanced CAP

02

priority CAP (PCAP) for a 4410 or 9310 LSM enhanced CAP.

Refer to “How to Specify a CAPid” on page 29 for a complete explanation of CAPid formats.

Lsm

identifies an LSM that contains a single CAP.

lsm-id

specifies the single CAP that you want to view. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

Row

identifies a row number in a CAP. If you do not specify this parameter the command defaults to row 0.

rr

specifies the row number. Allowable values for *rr* are decimal and are specific to the CAP type. Rows are numbered starting at the top of the CAP as follows:

- 0-2 for a standard CAP
- 0-39 for an enhanced CAP (for both magazine-style CAPs)
- 0-19 for a WolfCreek CAP (20-cell magazine-style CAP)
- 0-29 for a WolfCreek optional CAP (30-cell CAP)
- 0-13 for a 9740 TimberWolf CAP (0-9 for the removable magazine)
- 0 for a PCAP.

Column

identifies the column number within a CAP. If you do not specify this parameter the command defaults to column 0.

cc

specifies the column number. Allowable values for cc are decimal and are specific to the CAP type. Columns are numbered starting at the left of the CAP row as follows:

- 0-6 for a standard CAP
- 0 for magazine-style CAPs and PCAPs
- 3 for 9740 fixed or removable magazine CAP.

CEll

indicates that a camera is to focus on a cartridge storage or diagnostic cell in an LSM panel. If you do not specify the Lsm, Panel, Row, and Column parameters, the command defaults to LSM 00:00, panel 0, row 0, column 0.

Lsm

identifies an LSM. If you do not specify this parameter, the command defaults to LSMid 00:00.

lsm-id

specifies the LSMid. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

Panel

designates the LSM panel number containing the cartridge storage or diagnostic cell that the camera is to view. If you do not specify this parameter the command defaults to panel 0.

pp

specifies the panel number. Allowable values for pp are decimal and are specific to the LSM type:

- 0-19 for LSM Models 4410 and 9310 PowderHorn
- 0-2 for WolfCreek LSM Model 9360-050
- 0-3 for WolfCreek LSM Model 9360-075
- 0-4 for WolfCreek LSM Model 9360-100
- 0-3 for TimberWolf LSM Model 9740.

Row

identifies a row number in an LSM panel. If you do not specify this parameter the command defaults to row 0.

rr

specifies the row number. Allowable values for *rr* are decimal and are specific to the LSM type. Rows are numbered starting at the top of the panel as follows:

- 0-14 for outer wall panels (Models 4410 and 9310)
- 0-5 and 8-14 for inner wall panels (Models 4410 and 9310)
- 0-41 for WolfCreek panels (all models)
- For TimberWolf (Model 9740), 0-41 on panels 0, 2, and 3; 36-41 on panel 1.

Notes:

- Column 3 on panel 2 allows row entries only on rows 28-41.
- The cells on panel 3 are optional.

Column

identifies the column number within a panel. If you do not specify this parameter the command defaults to column 0.

cc

specifies the column number. Allowable values for cc are decimal and are specific to the LSM type. Columns are numbered starting at the left of the panel as follows:

- 0-23 for outer wall panels (Models 4410 and 9310)
- 0-19 for inner wall panels (Models 4410 and 9310)
- 0-5 for WolfCreek panels (all models).
- For TimberWolf (Model 9740), 0-3 for panels 0, 2, and 3 (if the optional cells are present); 0-2 for panel 1.

DRive

indicates that a camera is to focus on a cartridge drive. You **must** designate the Address parameter to identify the drive. The Host parameter enables you to view a drive defined to another host.

Address

specifies the address of a cartridge drive. The Address parameter defines the operating system address of the transport you want to inspect.

xxx

is the hexadecimal address of the transport. The HSC verifies that the specified address matches the LIBGEN-defined address for the given host.

Host

gives meaning to the Address parameter when the drive being inspected is not defined in the LIBGEN for the host from which the VIew command is being entered.

If you do not specify the Host parameter, the HSC checks the LIBGEN-defined drive list for the host from which you entered the VIew command. If the address is found in the drive list, the command is executed.

host-id

identifies the host where the transport is defined.

PLaygrnd

indicates that a camera is to focus on a playground cell. If the Lsm and Column parameters are not specified, the command defaults to the relative location of the cell in the playground in LSM 00:00.

☞ **Note:** The playground is a reserved area of cells where the robot deposits cartridges that it finds in its hands during LSM initialization. Normal LSM initialization recovery processing moves cartridges from the playground cells to either their home cells or their intended destinations, but under abnormal circumstances cartridges may be left in playground cells. Refer to the appropriate StorageTek hardware operator’s guide for the location of the playground in the LSM.

Lsm

identifies an LSM. If you do not specify this parameter, the command defaults to LSMid 00:00.

lsm-id

specifies the LSMid. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

Column

identifies the relative location of the cell in the playground for a panel. If you do not specify this parameter, the command defaults to the relative location of the cell in the playground.

cc

specifies the relative location of the cell in the playground. Allowable values for *cc* are decimal and are specific to the LSM type. (Some LSMs have multiple playground cells and some have only one.)

PTp

indicates that a camera is to focus on a pass-thru port (PTP) cell. You can designate a particular PTP using the Lsm and Xlsm parameters, a particular cell using the Column parameter, and specify the viewing time using the Time parameter.

Lsm

identifies an LSM. If you do not specify this parameter, the command defaults to LSMid 00:00.

lsm-id

specifies the LSMid. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

Xlsm

identifies the PTP to be inspected by defining the LSM that shares the PTP.

Each PTP is identified by the two LSMs it services. The Lsm parameter identifies which robot is used to view the PTP, and the Xlsm parameter identifies the LSM that shares the PTP. This distinction is necessary whenever an LSM contains more than one PTP.

If Xlsm is not specified for an LSM containing two or more PTPs, the HSC examines the LIBGEN and selects the first PTP defined there for Lsm(lsm-id).

l

specifies the LSM number of the adjacent LSM. Values for *ll* are hexadecimal in the range from 00 through 17. (The ACS is identified in the Lsm parameter.)

Column

identifies the column number within a panel. If you do not specify this parameter the command defaults to column 0.

c

specifies the column number. Allowable values for *c* are decimal and are specific to the LSM type:

- 0-3 for LSM Models 4410, 9310, and 9740
- 0 or 1 for WolfCreek LSMs (all models).

Note: When the PTP is being shared by two different LSM types, the upper limit of the column value is determined by the LSM with the smaller PTP capacity.

Time

defines the number of seconds you want the camera to remain focused on the specified element.

ttt

is the number of seconds. Values for *ttt* are decimal. The minimum time is 5 seconds and the maximum is 120 seconds. (Leading zeroes are not required.)

If Time is not specified, or if the specified *ttt* value is not within the allowable range, Time defaults to the value established by the OPTion Viewtime=*nnn* command. If OPTion Viewtime has not been entered, then Time defaults to ten seconds.

Note: Excessive use of long viewing time intervals may have a negative impact on performance. The robot is not available to perform other tasks while it is viewing a component.

Examples

The following examples illustrate the use of the VIew command.

View CAP Cell - LSM 00:00, Row 00, Column 00, for 5 Seconds

```
VIEW CAP TIME(5)
```

View CAP Cell - LSM 00:01, Row 00, Column 05, for 5 Seconds

```
VI CA L(ØØ:Ø1) C(Ø5) T(5)
```

View a Drive Defined To This Host

```
VI DR A(411)
```

View a Drive Defined to JES2 Host HSC1

```
VI DR A(413) H(HSC1)
```

From LSM 00:01, View Column 00 of the PTP That Connects to LSM 00:02

```
VI PT L(ØØ:Ø1) X(2)
```

From LSM 00:00, View Column 01 of the PTP That Connects to LSM 00:02

```
VI PT X(2) C(Ø1)
```

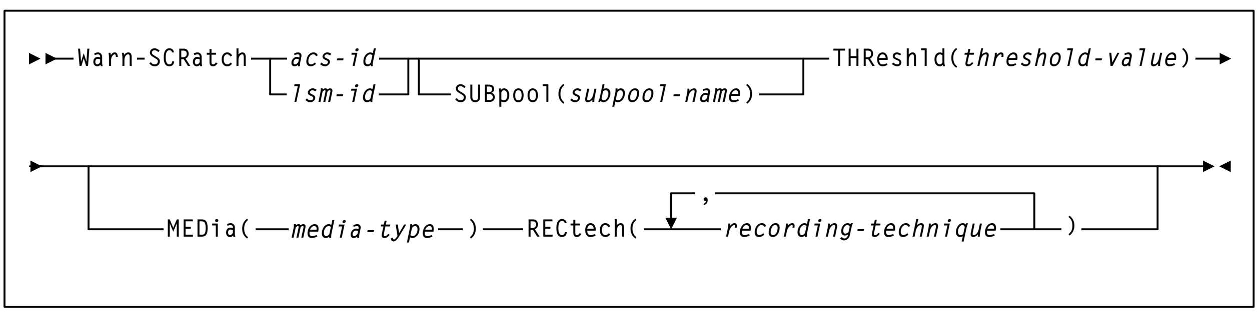
WARN Command

The Warn command is used to establish the scratch warning threshold values. Setting a threshold value causes a warning message to be issued when the number of scratches falls below the specified threshold. The following list shows how the Warn command allows you to specify parameters that can narrow the scope of the threshold values you set:

- If SUBpool, MEDia, and RECtech are not supplied, the threshold value applies to scratch volumes for the specified ACS or LSM.
- If SUBpool is supplied, but MEDia and RECtech are not, the threshold value applies to scratch volumes for the specified subpool and ACS or LSM.
- If MEDia and RECtech are supplied, but SUBpool is not, the threshold value applies to scratch volumes for the specified media type, recording technique, and ACS or LSM.
- If SUBpool, MEDia, and RECtech are supplied, the threshold value applies to scratch volumes for the specified subpool, media type, and recording technique in the ACS or LSM.

Note: Use the Display THReshld command to display the current Warn threshold values (refer to “Display THReshld” on page 121 for details on command syntax and parameters).

Syntax



Command Name

Warn
initiates the Warn command.

Parameters

SCRatch
indicates that scratch threshold values are to be set.

acs-id
specifies the ACS on which to alter threshold values. The ACSid is a hexadecimal value from 00-FF.

lsm-id

specifies the LSM on which to alter threshold values. The LSMid is comprised of the ACSid and the LSM number. The format of an LSMid is *AA*:*LL*, where *AA* is the ACSid (hexadecimal 00-FF) and *LL* is the LSM number (hexadecimal 00-17).

SUBpool

indicates that you want to designate a subpool. This parameter is optional.

subpool-name

is the name of the subpool.

Note: Scratch subpool names are specified with the SCRPOol control statement. Refer to ‘‘Scratch Subpool Control Statement’’ in the *HSC System Programmer’s Guide* for information on the SCRPOol control statement.

THReshld

indicates that you want to alter the threshold value.

threshold-value

specifies the minimum number of scratch volumes that are allowed before the HSC issues a warning message. Allowable threshold values are decimal in the range from 0 through 99,999.

The warning interval values are preset at five minutes.

Note: When the number of scratch volumes in an ACS or LSM drops below the threshold value, the system issues a warning message.

MEDia

optionally, specifies the media type for the threshold. When MEDia is specified, RECtech must also be specified.

Notes:

- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

media-type

identifies the media type. Valid media types are:

LONGItud

indicates any Standard or ECART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on a 4490, 9490, or 9490EE transport but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C (HELical) cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C). DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

T9840 cartridge media capacities are 20GB (T9840A and T9840B), 40GB (T9840C), or 75GB (T9840D).

STK2

indicates any T9940 cartridge.

STK2P

indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P). STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

T10000T1 or **T1**

indicates a full-capacity 500GB T10000A or 1TB T10000B cartridge. T10000T1 can be abbreviated as **T1**.

T10000TS or **TS**

indicates a smaller-capacity 120GB T10000A or 240GB T10000B cartridge. T10000TS can be abbreviated as **TS**.

T10000T2 or **T2**

indicates a full-capacity 5TB T10000C cartridge. T10000T2 can be abbreviated as **T2.**

T10000TT or **TT**

indicates a smaller-capacity 1TB T10000C cartridge. T10000TT can be abbreviated as **TT**.

RECtech

optionally, specifies the recording technique for the threshold. RECtech indicates the method used to record data tracks on the tape surface. When RECtech is specified, MEDia must also be specified.

You can enter a list of recording techniques, but they must be separated by commas.

Notes:

- A list specifies a generic pool from which a selection is made. There is no implied priority.
- If neither MEDia nor RECtech is specified, the threshold value applies to the accumulated total of scratch cartridges.
- **The SL8500 library supports the T9840A, T9840B, T9840C, T9840D, T9940B, T10000A, T10000B, and T10000C media types and recording techniques.**
- **The SL3000 library supports the T9840C, T9840D, T10000A, T10000B, and T10000C media types and recording techniques.**

recording-technique

identifies the recording technique. Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 transport.

STK1R34
indicates any 3490E-image 9840 transport.

STK1R35
indicates any 3590-image 9840 transport.

STK1RA
indicates a 3490E or 3590-image T9840A transport.

STK1RA34
indicates a 3490E-image T9840A transport.

STK1RA35
indicates a 3590-image T9840A transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK1RAB
indicates a 3490E or 3590-image T9840A or T9840B transport.

STK1RAB4
indicates a 3490E-image T9840A or T9840B transport.

STK1RAB5
indicates a 3590E-image T9840A or T9840B transport.

STK1RC
indicates a 3490E or 3590-image T9840C transport.

STK1RC34
indicates a 3490-image T9840C transport.

STK1RC35
indicates a 3590-image T9840C transport.

STK1RD
indicates any T9840D transport.

STK1RDE
indicates an encryption-enabled T9840D transport.

STK1RDN
indicates a non-encryption enabled T9840D transport.

STK1RD34
indicates a non-encryption enabled 3490E-image T9840D transport.

STK1RD35
indicates a non-encryption enabled 3590-image T9840D transport.

STK1RDE4
indicates an encryption-enabled 3490E-image T9840D transport.

STK1RDE5
indicates an encryption-enabled 3590-image T9840D transport.

STK2P
indicates any 9940 transport.

STK2P34
indicates any 3490E-image 9940 transport.

STK2P35
indicates any 3590-image 9940 transport.

STK2PA
indicates a T9940A transport.

STK2PA34
indicates a 3490E-image T9940A transport.

STK2PA35
indicates a 3590-image T9940A transport.

STK2PB
indicates a T9940B transport.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The T10000 parameters in the table below have changed. The old parameter names are being phased out and may be removed in a future product release.

Old Parameter Name:	New Parameter Name:
T1A	T10KA
T1AE	T10KAE
T1AN	T10KAN
T1B	T10KB
T1BE	T10KBE
T1BN	T10KBN

T10K
indicates all T10000 transports.

T10KN
indicates all non-encrypted T10000 transports.

T10KE
indicates all encrypted T10000 transports.

T10KA
indicates any T10000A transport.

T10KAN
indicates a non-encryption enabled 3490E- or 3590-image T10000A transport.

T1A34
indicates a non-encryption enabled 3490E-image T10000A transport.

T1A35
indicates a non-encryption enabled 3590-image T10000A transport.

T10KAE
indicates an encryption-enabled 3490E- or 3590-image T10000A transport.

T1AE34
indicates an encryption-enabled 3490E-image T10000A transport.

T1AE35
indicates an encryption-enabled 3590-image T10000A transport.

T10KB
indicates any T10000B transport.

T10KBN
: indicates a non-encryption enabled 3490E- or 3590-image T10000B transport.

T1B34
: indicates a non-encryption enabled 3490E-image T10000B transport.

T1B35
: indicates a non-encryption enabled 3590-image T10000B transport.

T10KBE
: indicates an encryption-enabled 3490E- or 3590-image T10000B transport.

T1BE34
: indicates an encryption-enabled 3490E-image T10000B transport.

T1BE35

indicates an encryption-enabled 3590-image T10000B transport.

T10KC
: indicates any T10000C transport.

T10KCN
: indicates a non-encryption enabled 3490E- or 3590-image T10000C transport.

T1C34
: indicates a non-encryption enabled 3490E-image T10000C transport.

T1C35
: indicates a non-encryption enabled 3590-image T10000C transport.

T10KCE
: indicates an encryption-enabled 3490E- or 3590-image T10000C transport.

T1CE34
: indicates an encryption-enabled 3490E-image T10000C transport.

T1CE35
: indicates an encryption-enabled 3590-image T10000C transport.

Note: If neither MEDia nor RECtech is specified, the threshold value applies to the accumulated total of scratch cartridges.

Examples

The following examples illustrate the use of the Warn command.

Set the Threshold Value at 2000 for ACS 00

```
WARN SCRATCH ØØ THRESHLD(2ØØØ)
```

Set the Threshold Value at 1000 for LSM 00:01

```
W SCR ØØ:Ø1 THR(1ØØØ)
```

Set the Threshold Value for Subpool SCRATCH001 at 400 in LSM 00:01

```
W SCR ØØ:Ø1 SUBPOOL(SCRATCHØØ1) THR(4ØØ)
```

Set the Threshold Value for Subpool SCRATCH002 at 3210 in ACS 00

```
W SCR ØØ SUB(SCRATCHØØ2) THR(321Ø)
```

Set the Threshold Value at 50 for 9490 ECARTs for ACS 00

```
W SCR ØØ MEDIA(ECART) RECTECH(36BTRACK) THR(5Ø)
```

Set the Threshold Value at 6 for 10GB Helical Carts for LSM 002

```
W SCR ØØ2 MED(DD3A) REC(DD3) THR(6)
```

SCP Operator Commands

The system control program (SCP) provides the services necessary to allow control of tasks, files, I/O devices, processors, and local storage. SCP operator commands enable the operator to execute various system control program functions.

The following SCP operator commands are supported:

- * (comment)
- AUTHorize
- CANCEL
- CP
- DEFine
- DUMP
- FILE
- HELP
- Query
- Reply
- Modify (SCP)
- SET
    - CONSlog
    - DUMPOpts
    - MSGtype
    - PERFlog
    - TRACE
- SLK
- STArt
- STOP
- STOPSCP
- SUBSYS

Note: SCP operator commands do not require a prefix character.

* (comment) Statement

The ‘‘*’’ (comment) statement may be used to place any text in the console log file. All comment statements are included on the hardcopy log (CONSLOG) if CONSlog is set on. No other processing occurs.

Syntax

```
►►─*─┬──────────┬──────────────────────────────────────────────►◄
     └─comments─┘
```

Parameters

*
: initiates a comment statement. A comment statement is defined as any statement which has an ‘‘*’’ (asterisk) as the first nonblank character.

comments
: any text (optional) following the ‘‘*.’’ No restrictions apply.

Example

The following example illustrates the use of the comment statement.

```
* this is a sample comment statement
```

Authorize Command

The AUTHorize command is used to grant or remove access to the service machine to specific users. The following privileges may be granted:

- Commands - The specified virtual machines are authorized to input commands and jobs to the control program. Input from all other virtual machines is discarded and the following SCP message is issued:

  ```
  ... Invalid command: ...
  ```

- NETVM - The specified virtual machines are treated as RSCS network server machines by the control program. They are also authorized to send commands and jobs.
- Messages - The specified virtual machines are authorized to receive messages with the designated route codes from the control program.
- None - All authorization is removed for the specified virtual machines.

Certain default authorizations are performed during initialization.

- The service machine always has authorization for commands, and message route codes 1, 2, 3, 5, and 10. It does not need to be specified in an AUTHorize command unless other specific route codes are desired.

  Commands issued by the library service machine in its initiation profile, via CP SMSG to itself, or from its virtual console (in connected mode) are always accepted.

- User ID OPERATOR has authorization, for commands, and message route codes 1, 2, 3, 5, and 10.
- The network server returned by the CMS IDENTIFY command is authorized as a network server.

Notes:

- The list of authorized users may be displayed by the Query Operator command. (Refer to "QUERY Command" on page 265 for details on the Query command syntax and parameters.) The AUTHorize command may be used to edit the list.
- To change user authorizations, clear all authorizations using the NONE parameter and then issue the AUTHorize command with the correct parameters.

Syntax

```
                                       ┌─,──────────────┐
►►─AUTHorize─┬─userid────┬─(─┬─────────▼─┬─CMDS─────────────┴─┬─┬──────────────►◄
             └─user-list─┘   │           ├─MSGS route-codes───┤ │
                             │           └─NETVM──────────────┘ │
                             └─NONE─────────────────────────────┘
```

Command Name

AUTHorize
initiates the AUTHorize command.

Parameters

userid or ***user-list***
specifies one or more virtual machine names (user IDs and optional node IDs). The elements in a user-list must be separated by blanks. For example:

```
user1
user1
user2
user1 AT node1
user1 VIA  user2
user1 AT node1 VIA user2
user1 user2 AT node1 user3 VIA user4 user5
```

Notes:

- The keyword AT identifies the following token as the network node where the user is defined. If omitted, it defaults to the local node name returned by the CMS IDENTIFY command.
- The keyword VIA identifies the following token as the network server virtual machine by which the user is accessible. If omitted, it defaults to the network server ID returned by the CMS IDENTIFY command. The purpose of VIA is to support multiple network servers and the StorageTek Common Library Server software.

CMDS
indicates that each specified virtual machine is to be authorized to send commands to the service machine. There is no limit to the number of such authorized machines.

NETVM
indicates that each specified virtual machine is to be treated as an RSCS network server machine. The CMDS privilege is automatically granted.

MSGS

indicates that each specified virtual machine is to be authorized to receive messages for the listed route codes.

route-codes

is a list of MVS route codes, separated by blanks.

The following list is extracted from OS/VS Message Library: VS2 Routing and Descriptor Codes. As indicated, not all codes are currently used.

1	Master console action
2	Master console information
3	Tape pool
4	Direct access pool (not used)
5	Tape library
6	Disk library (not used)
7	Unit record pool (not used)
8	Teleprocessing control (not used)
9	System security
10	System/error maintenance
11	Programmer information
12	Emulation (not used)
13	Reserved
14	Reserved
15	Reserved
16	Reserved

NONE

indicates that each specified virtual machine is to be unauthorized. They become unknown to the service machine.

Notes:

- More than one authorization parameter may be specified at a time. For example:

```
AUTHORIZE userid (CMDS MSGS 1 3 5
```

- To change user authorizations, clear all authorizations using the NONE parameter and then issue the AUTHorize command with the correct parameters.

Examples

The following examples illustrate the use of the AUTHorize command.

Authorize USER1 to send commands to the service machine

```
AUTHORIZE USER1 (CMDS
```

To authorize USER1 and USER3 for commands and message route codes 1, 3, and 5, the following example applies.

Authorize Users for CMDS and MSGS 1 3 5

```
AUTHORIZE USER1 USER3 (CMDS MSGS 1 3 5
```

CANCEL Command

The CANCEL command is used to terminate an active task.

Note: Use the Query Active command to determine active tasks. Refer to “QUERY Command” on page 265 for details on the Query command syntax and parameters.

Syntax

```
►►─CANCEL─taskid─┬──────┬──────────────────────────────────────────►◄
                 └─DUMP─┘
```

Command Name

CANCEL
initiates the CANCEL command.

Parameters

taskid
specifies the unique task name associated with the task to be cancelled. Active taskids are provided in the Name field of the output from the Query Active command.

DUMP
optionally specifies that a dump of all virtual storage is to be performed and directed to the virtual machine identified by the SET DUMPOpts command during initiation. Refer to “SET DUMPOPTS Command” on page 272 for details on the SET DUMPOpts command syntax and parameters.

Example

The following example illustrates the use of the CANCEL command.

Cancel Task HSC4UTIL

```
CANCEL HSC4UTIL
```

CP Command

The CP command allows the operator to transmit commands to the VM control program environment without leaving the SCP environment. The CP command may only be issued from the service machine's connected virtual console, or in the startup profile (ACS SYSDEF) commands entered via the virtual reader.

Syntax

```
►►─CP─┬─────────┬──────────────────────────────────────────────────────►◄
      └─cmdparm─┘
```

Command Name

CP
initiates the CP command.

Parameters

cmdparm
is any valid CP command and parameter string.

If this field is omitted, you are placed in the CP environment and may enter CP commands without preceding each command with CP. To return to the SCP environment, issue the CP command BEGIN.

Example

The following example illustrates the use of the CP command.

Issue the CP command SET MSG OFF

```
CP SET MSG OFF
```

DEFINE Command

The DEFine command is used to logically define channels, control units, and devices to the SCP. It performs the same function as a traditional IOGEN for an operating system, but is dynamic (rather than static).

DEFine commands are typically issued in the initialization profile to define the system's I/O configuration before normal processing begins. You can define a device to the SCP that is not CP-defined to the service machine.

Channel, control unit, and device must be defined for a virtual device that the service machine is to use, before any I/O may be performed by the SCP.

Syntax

```
►►─DEFine─┬─CHAN──chnum──chtype───────────────┬──────────────────────────►◄
          ├─CU──chcu──cutype──────────────────┤
          └─DEV──cuu──devtype──┬──────────┬───┘
                               └──id──────┘
```

Command Name

DEFine
initiates the DEFine command.

Parameters

CHAN
identifies a channel. chnum specifies a one-digit hexadecimal number that is used when referring to this channel.

chtype
is the channel type. Valid channel types are:

BYTEMUX
BLOCKMUX

CU
identifies a control unit.

chcu
is a two-digit hexadecimal number. The first digit is the number of the channel to which this control unit is connected. The second digit is the control unit address on that channel.

cutype
is the control unit type. It must be compatible with the type of channel to which it is connected. Listed below are the control unit types supported, with the required channel types and the devices that may be connected to them.

2821	BYTEMUX channel, unit record devices
3274	BYTEMUX channel, 327x graphics devices
3830	BLOCKMUX channel, DASD devices

DEV

identifies a device.

cuu

is a three-digit hexadecimal number representing the full device address as channel number, control unit number, and device number.

devtype

is one of the following device types

3215	standard console
3278	graphics console, including 3277
2540	Rcard reader
2540	Pcard punch
1403	printer (including 3211)
3350	DASD
3380	DASD
3390	DASD
FB512	DASD (includes 3310, 3370, 9332, 9335)

id

is an optional field which may be used to ‘‘tag’’ the device definition. It is truncated to six characters.

Example

The following example illustrates the use of the DEFine command.

Define a Channel

```
DEFINE CHAN 5 BLOCKMUX
```

DUMP Command

The DUMP command is used to force the production of a dump of service machine storage at any time. All of the service machine's storage is dumped and sent to the destination defined by the SET DUMPOpts command.

Note: Refer to "SET DUMPOPTS Command" on page 272 for details on the SET DUMPOpts syntax and parameters.

The dump is produced via the CP VMDUMP command. The default dump destination is the service machine's reader (in class V).

Syntax

```
►►─DUMP─┬─────────┬──────────────────────────────────────────────────►◄
        └─comment─┘
```

Command Name

DUMP
initiates the DUMP command.

Parameters

comment
optionally describes the dump. It may be any string, up to 72 characters long (beginning from the first nonblank after DUMP). No delimiters are required.

Example

The following example illustrates the use of the DUMP command.

Dump service machine storage to SET DUMPOpts destination

```
DUMP
```

FILE Command

The FILE command is used to define files. It is functionally equivalent to an MVS JCL DD statement.

The JCL /FILE statement invokes the FILE command internally.

Syntax

```
►►─FILE──ddname──┬──┬─BLOCKIO─┬──vaddr─DSN─dsn──────────────────────────────┬──►◄
                 │  └─DISK────┘                                              │
                 └──┬─CLEAR─────────────────────────────────┬──┬─────────┬──┘
                    ├─DEV──┬─vaddr──────────────────────────┤  └─DSN dsn─┘
                    │      ├─CARD───────────────────────────┤
                    │      └──┬─PNCH─┬──┬──────────────┬─────┤
                    │         └─PRNT─┘  └─CLass class─┘     │
                    ├─IUCV──userid──────────────────────────┤
                    └─*─────────────────────────────────────┘
```

Command Name

FILE
initiates the FILE command.

Parameters

ddname
is equivalent to the CMS FILEDEF ddname parameter.

BLOCKIO
indicates that CP DASD Block I/O System Service is to be used to read from and write to DASD device vaddr. An IUCV CONNECT to USERID=*BLOCKIO is performed.

Note: The DSN parameter is required for this filetype.

DISK
indicates that vaddr is to be treated as a DASD file.

Note: The DSN parameter is required for this filetype.

CLEAR
indicates that the definition for ddname is to be deleted.

DEV
indicates that the file is to be associated with the following device: vaddr, CARD, PNCH, or PRNT.

CARD
requests that a new virtual reader (2540R) be defined and assigned to this file.

PNCH
requests that a new virtual punch (2540P) be defined and assigned to this file.

PRNT
requests that a new virtual printer (1403) be defined and assigned to this file. C

CLass
is the VM spool class to be used with this print or punch device.

class
is the class.

IUCV
indicates that IUCV (Inter-User Communications Vehicle) is to be used for input and output, and that there is no real or virtual device associated with the file.

userid
is the user ID to which an IUCV CONNECT must be performed. If this parameter is omitted, then other virtual machines will request connection to the ACS service machine.

Notes:

- *MSG is a special user ID indicating the CP Message System Service.
- *BLOCKIO is a special user ID indicating the CP DASD Block I/O System Service.

*****

indicates that contents of the file follow. This filetype is only allowed as a /FILE statement in a job which is in a spool file for an ACS service machine virtual reader device. This must be the last JCL statement in the file. The file contents are all of the records which follow, until the end of the file.

vaddr
is the device virtual address. The device type will be obtained from CP.

DSN
specifies a data set name.

Note: DSN is required for files which reside on DASD devices. For these files preallocation is assumed (e.g., there is a VTOC entry for OS format, or a RESERVED file for CMS). For all other filetypes DSN is optional.

dsn
is the data set name (a PDS member name may be specified for DASD files).

Example

The following example illustrates the use of the FILE command.

Define File TESTPARM That is Associated With Device 500

```
FILE TESTPARM DEV 500 DSN TEST.PARMLIB(TESTPARM)
```

HELP Command

The SCP HELP command displays information about SCP commands, messages, and various topics of interest.

Notes:

- Use the CMS command HELP ACS MENU for information on HELP available in the CMS environment. Refer to “CMS HELP Command” on page 294 for details on the CMS HELP command syntax and parameters.
- Use the HSC Display CMd command for information about HSC commands. Refer to “DISPLAY Command” on page 62 for details on the Display command syntax and parameters.

Syntax

```
►►─HELP──┬─HELP──────────┬────────────────────────────────────────►◄
         ├─scp-command───┤
         ├─diag-command──┤
         ├─msgnum────────┤
         └─topic─────────┘
```

Command Name

HELP
initiates the HELP command. HELP HELP displays information about the HELP command.

Parameters

scp-command
indicates that information is to be displayed about the named SCP operator command.

COMMENT	AUTHORIZ	CANCEL	CONSLOG	CP
DEFINE	DUMP	DUMPOPTS	FILE	HELP
MSGTYPE	PERFLOG	QUERY	REPLY	SET
SLK	START	STOP	STOPSCP	SUBSYS
TRACE				

diag-command
indicates that information is to be displayed about the named diagnostic command. DDICT DEBUG HPER NODEBUG WHERE

msgnum

requests a display of information about the given message. Only the system message prefix (SLK), message number, and (optionally) the message type portions of the message ID should be given. All messages within a system (SCP or HSC) have been assigned a unique decimal number.

topic

indicates that information is to be displayed about the named topic. Topics include (but are not limited to) IPCS functions provided and SCP utilities.

DUMPSCAN JCL SLIMDISK SLIVINT SLUETRAC SLUPERF

Examples

The following examples illustrate the use of the HELP command.

Display information about the SCP SET command

```
HELP SET
```

Display information about the SLIMDISK utility

```
HELP SLIMDISK
```

Protected Modify Command (SCP)

The SCP modify command is used to issue HSC commands when a null prefix character is defined for the HSC subsystem. Refer to “Operator Command Syntax Rules” on page 21 for information on command prefix characters.

Syntax

```
►►─taskname─hsc-command──────────────────────────────────────────────►◄
```

Parameters

taskname
is the HSC task name, which is the job name on the /JOB statement of the startup SLKJCL. Refer to ‘‘HSC Startup Job (ACS SLKJCL)’’ in the *HSC Installation Guide* for information about the startup SLKJCL.

Note: se the SCP Query Active command to determine the HSC task name (see “QUERY Command” on page 265). In the Query Active output display, the HSC subsystem is identified in the ‘‘Prog’’ column as SLSBINIT. The corresponding entry in the ‘‘Name’’ column is the HSC task name.

hsc-command
is any valid HSC command and zero or more parameters.

Example

The following example illustrates the use of the SCP Modify command.

Issue the HSC Mount Command Using SCP Modify Command taskname

```
MOUNT 123456 BØ4
```

QUERY Command

The Query command is used to obtain status information about the control program and tasks. A console message presents a formatted, multiple-line display of the requested status information.

Note: Use the Display command to request information about library components. Refer to “DISPLAY Command” on page 62 for details on the Display command syntax and parameters.

Usage Notes

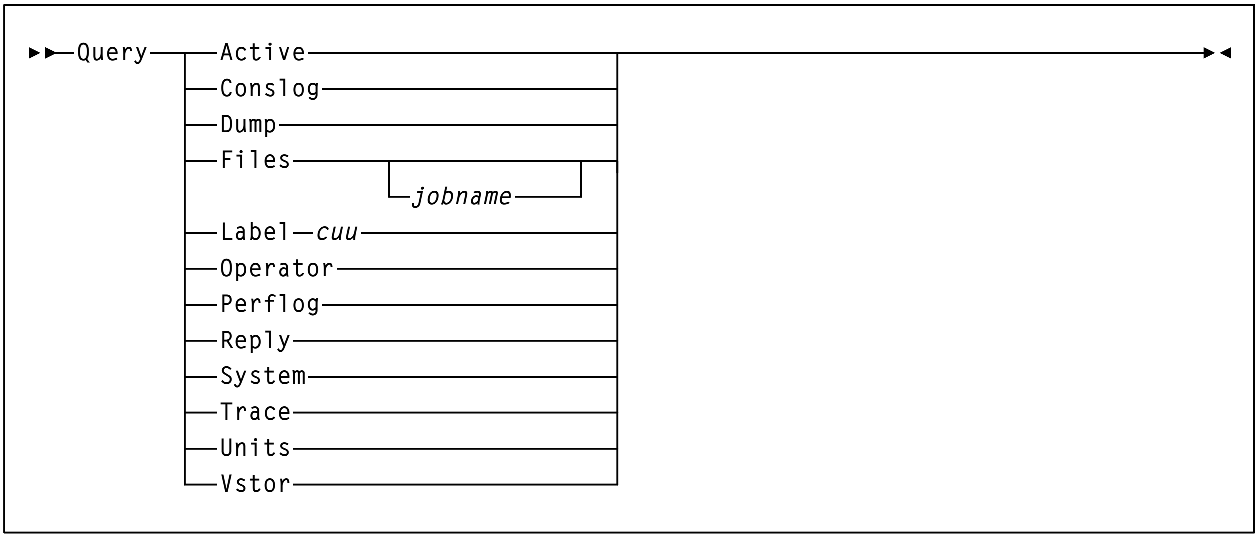
The Query Operator command displays a list of SCP authorized user IDs and their privileges. Each has an associated console ID which is the first field in the display. The user ID (user name) can also be referred to as a console name.

These consoles receive messages according to the assigned ROUTCDEs listed with the MSGS privilege. A console may also receive messages when explicitly specified with a message request even if the MSGS privilege has not been specified. This includes responses from commands issued from that console (user ID).

- The first three consoles/names are reserved for the SCP service virtual machine.
  - Console 00 is the ‘‘hardcopy log’’ which is the SCP CONSLOG file.

    Note: The SET CONSlog ON command must be issued for logging to occur.
  - Console 01 is the service machine virtual console.
  - Console 02 is the service machine virtual reader, not actually usable as a console.
- Console 03 is the user ID of the system operator.
- Console 04 is normally the user ID of the RSCS service machine.
- Any others have been defined via the SCP AUTHorize command.

Syntax



Command Name

Query
initiates the Query command.

Parameters

Active
displays the status of active tasks.

Conslog
displays the status of the CONSLOG file.

Dump
displays the status of the DUMP files.

Files
displays the status of all system files.

jobname
optionally indicates that only the files for the specified job are to be displayed.

Label
displays the VOLSER for the DASD with the specified device address.

cuu
is the device address.

Operator
displays the list of AUTHorized user IDs and their privileges.

Perflog
displays the status of the PERFLOG file.

Reply
displays all messages with replies or actions outstanding (message codes “A” and “R”).

System
displays the status of the control program (system).

Trace
displays the status of the TRACE file, along with the list of enabled events.

Units
displays the status for devices.

Vstor
displays the status of storage allocation.

Examples

The following examples illustrate the use of the Query command.

Display the Status of Active Tasks

```
QUERY ACTIVE
```

Sample Output

```
SLKTKC700I From VMHSC01 at LSTC2VM: Q A
SLSOQU097I Task Status:
Name      Prog      Key   Prior #Subs K Stor  Rdr Num  Class
*MASTER*  SLKTKM     1     5      5     68
ID        **IDLE**   8    68      0      7              D
HSC1      SLSBINIT   2    58     25    698     336      L
LIBUT1    **IDLE**   3    78      0      7              U
LIBUT2    **IDLE**   4    78      0      7              U
LIBUT3    **IDLE**   5    78      0      7              U
```

Display Any Messages That Are Waiting For a Reply

```
Q R
```

REPLY Command

The Reply command is used to respond to messages that require operator intervention. These messages have a one- or two-digit decimal number preceding the message text, called the reply number.

To respond to such a message, either use the Reply command, or just enter the reply number followed by a blank or a comma (as a separator) and then your reply text.

Note: If the message text has been cleared from the screen, use the Query Reply command to redisplay the original message. Refer to “QUERY Command” on page 265 for details on the Query command syntax and parameters.

Syntax

```
►►──┬───────┬──nn──┬──────────┬──────────────────────────────────►◄
    └─Reply─┘      ├─text─────┤
                   └─'text'───┘
```

Command Name

Reply
optionally initiates the Reply command.

Parameters

nn
is the reply number for the message that requires operator intervention. Leading zeros are not required. nn is a decimal number from 0 through 99.

text or ‘text’
is any (optional) character text. This text is passed to the task originating the message where it is processed.

If text is not enclosed in single quotes, then the text is passed in uppercase.

If text is enclosed in single quotes, then the text is passed respecting the case as submitted. The two quotes are deleted before passing the text.

Example

The following example illustrates the use of the Reply command.

Reply IGNORE to Message Reply Number 37

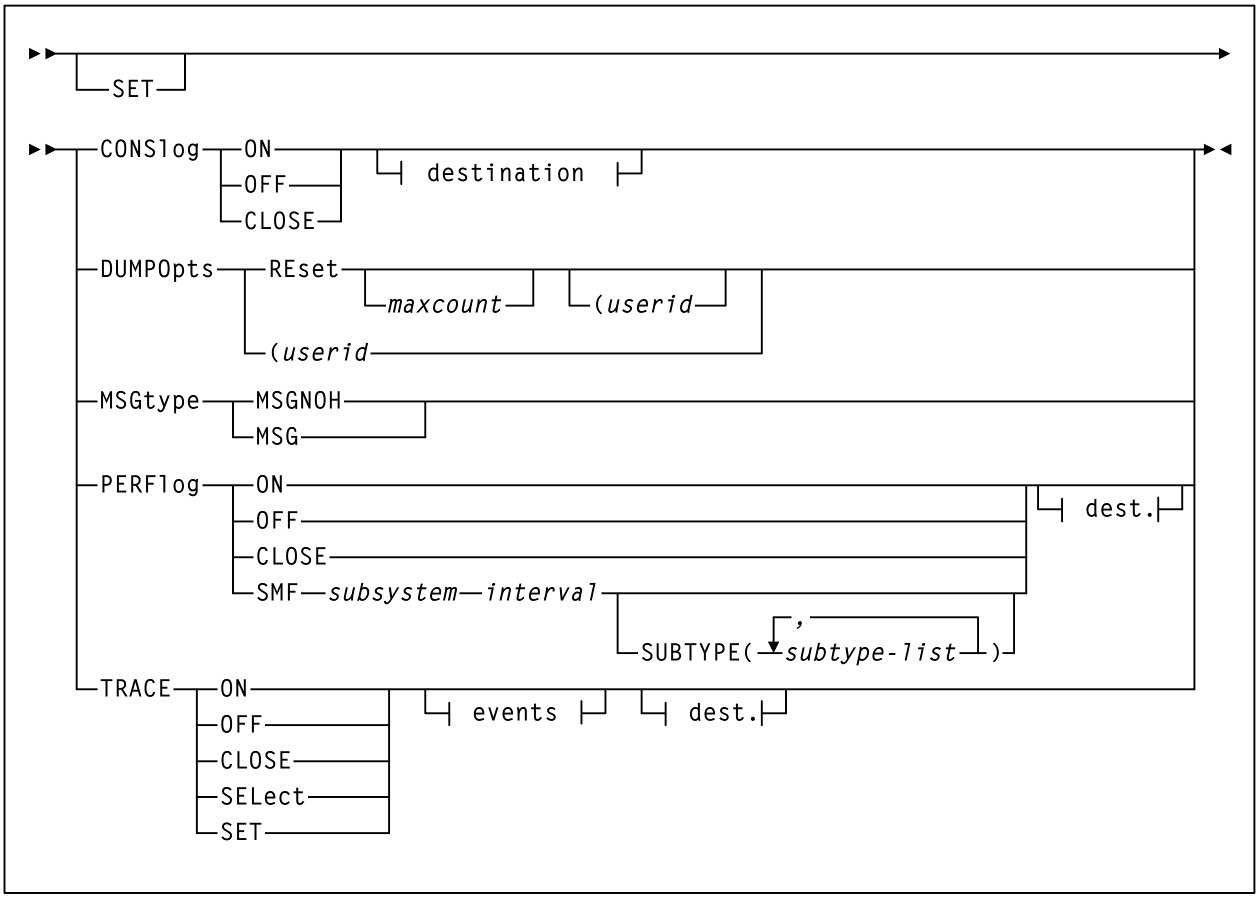
```
REPLY 37 IGNORE
```

SET Command

The SET command is used to alter the following control program features:

- console log features and destination
- dump file destination and maximum dump count
- message type to be issued
- performance log features and destination
- trace log features and destination.

Syntax

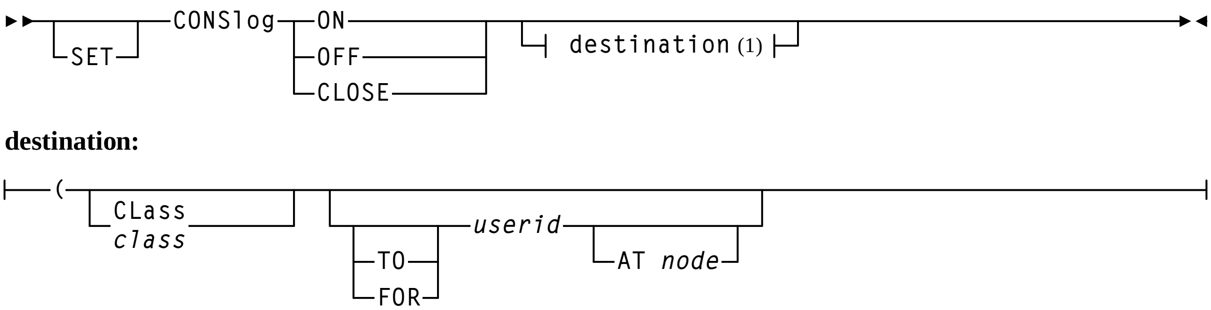


Note: Refer to the SET subcommand desired for parameter explanations.

SET CONSLOG Command

The SET CONSlog command allows the operator to control the logging of console input to a spool file.

Syntax



Note:
1. The specified destination remains in effect until it is changed by another SET CONSlog command, or until the SCP is shutdown and restarted.

Note: The specified destination remains in effect until it is changed by another SET CONSlog command, or until the SCP is shutdown and restarted.

Parameters

SET
optionally initiates the SCP SET command.

CONSlog
initiates the CONSlog command.

ON
enables the logging of console input with the listed options.

When logging is on, all commands are logged, and all messages are logged unless MCSFLAG parameters to WTO prohibit it. Replies to operator messages that included ROUTCDE=(9) (security) are logged with the reply data suppressed.

OFF
disables the logging of console input with the listed options.

CLOSE
closes the CONSLOG file and sends it to the defined destination. The ON/OFF status is unchanged. If logging is ON, the file is reopened automatically.

CLass
indicates the CP SPOOL class to be used to transfer the file to its destination. The initial setting is class C.

class

is the class.

TO or FOR

optionally indicates the file is to be sent to a specified virtual machine. The initial setting is TO the current user ID (‘‘*’’).

userid

is the name of the virtual machine that is to receive the file.

AT

indicates the network node name of the virtual machine that is to receive the file. The default is the current host.

node

is the network node name.

Example

The following example illustrates the use of the SET CONSlog command.

Enable Logging of Console Input for the Current User

```
ID SET CONSLOG ON
```

SET DUMPOPTS Command

The SET DUMPOpts command specifies or resets the maximum number of VMDUMP dumps to be taken. This prevents filling up VM spool space in the unlikely event that a severe cycle of abnormal terminations occurs.

The dump destination may be set to any virtual machine (user ID) on the local VM system to facilitate handling of the dump.

Syntax

```
►►─┬─────┬─DUMPOpts─┬─REset─┬───────────┬──┬─────────┬─┬──────────────►◄
   └─SET─┘          │       └─max-count─┘  └─(userid─┘ │
                    └─(userid───────────────────────────┘
```

Command Name

SET
optionally initiates the SET command.

Parameters

DUMPOpts
initiates the DUMPOpts command.

REset
causes the count values for the number of dumps taken and the dump threshold to be reset.

maxcount
is the threshold count for the number of dumps to allow before disabling dump processing. maxcount is a decimal number from 0 through 999. The initial setting is 50. Entering 0 disables dump processing immediately.

If you do not supply maxcount, the count of dumps taken is reset and the current threshold value remains unchanged.

userid
specifies the name of the virtual machine that is to receive the file. It must be on the same VM system as the service machine. The initial setting is the current user ID (‘‘*’’). The spool file generated by VM will be spool class V, filetype DMP.

Note: One or both parameters (REset, userid) must be specified.

Example

The following example illustrates the use of the SET DUMPOpts command.

Reset Dump Options and Set a Threshold Count of 40

```
SET DUMPOPTS RESET 4Ø
```

SET MSGTYPE Command

The SET MSGtype command is used to select the type of message to be output by the service machine.

By default, CP MSGNOH is used for sending messages to other virtual machines.

If the service machine is authorized, CP MSGNOH may be used. Usually, this means class B privileges.

If MSGNOH is selected and the ACS service machine is not authorized to use it, the message type will revert to MSG.

Using CP MSGNOH produces a message without time and sender header information. It is preferred for high activity service machines because it does not clutter the console screen of the message recipient.

Syntax

```
►►──┬───────┬──MSGtype──┬─MSG────┬──────────────────────────────────────►◄
    └─SET───┘           └─MSGNOH─┘
```

Command Name

SET
optionally initiates the SET command.

Parameters

MSGtype
initiates the MSGtype command.

MSG
indicates that the control program is to issue the CP MSG command.

MSGNOH
indicates that control program is to issue the CP MSGNOH command.

MSGNOH
is the initial setting if the service machine is permitted (by CP) to use CP MSGNOH.

Example

The following example illustrates the use of the SET MSGtype command.

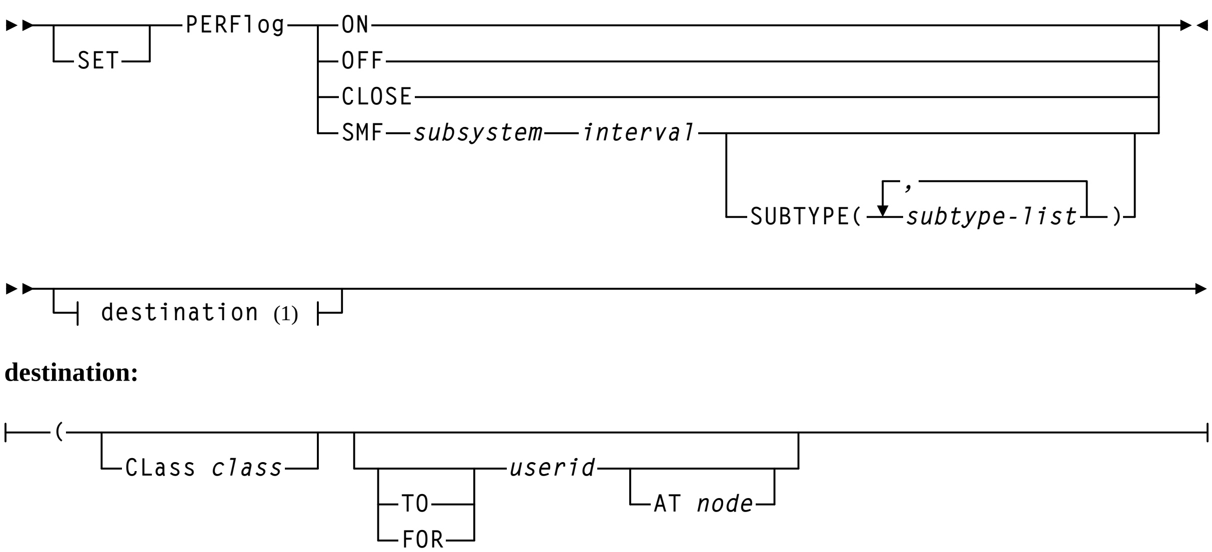
Set Message Output by the Service Machine to MSG

```
MSGTYPE MSG
```

SET PERFLOG Command

The SET PERFlog command allows the operator to control the logging of performance data (SMF) to a spool file. All queued data is logged without any filtering.

Syntax



Note:
1 The specified destination remains in effect until it is changed by another SET PERFlog command, or until the SCP is shutdown and restarted.

Note: The specified destination remains in effect until it is changed by another SET PERFlog command, or until the SCP is shutdown and restarted.

Command Name

SET
optionally initiates the SET command.

Parameters

PERFlog
initiates the PERFlog command.

ON
enables logging of performance data with the listed options.

OFF
disables logging of performance data with the listed options.

CLOSE
indicates that the log file is to be closed and sent to the defined destination. The ON/OFF status is unchanged. If logging is ON the file is reopened automatically.

SMF

indicates that SMF parameters follow.

Note: PERFlog must be set on for SMF recording to occur.

subsystem

is the subsystem (as specified by the LIBSUBSYS parameter in the SYSPROF) to which the parameters apply. This parameter is required if SMF is specified.

interval

specifies the recording interval in seconds for the given subsystem. This parameter is required if SMF is specified.

SUBTYPE

optionally specifies which SMF record subtypes are to be recorded for the specified subsystem.

subtype-list

is a list of one or more SMF record subtypes.

CLass

indicates the CP SPOOL class to be used to transfer the file to its destination. The initial setting is class P.

class

is the class.

TO or FOR

optionally indicates the file is to be sent to a specified virtual machine.

userid

is the name of the virtual machine that is to receive the file. The initial setting is TO the current user ID (‘‘*’’).

AT

indicates the network node name of the virtual machine that is to receive the file. The default is the current host.

node

is the network node name.

Examples

The following examples illustrate the use of the SET PERFlog command.

Enable Logging of Performance Data

```
PERFLOG ON (CLASS P TO VMHSCØ4 AT STKH2VM
```

Specify SMF Recording Parameters

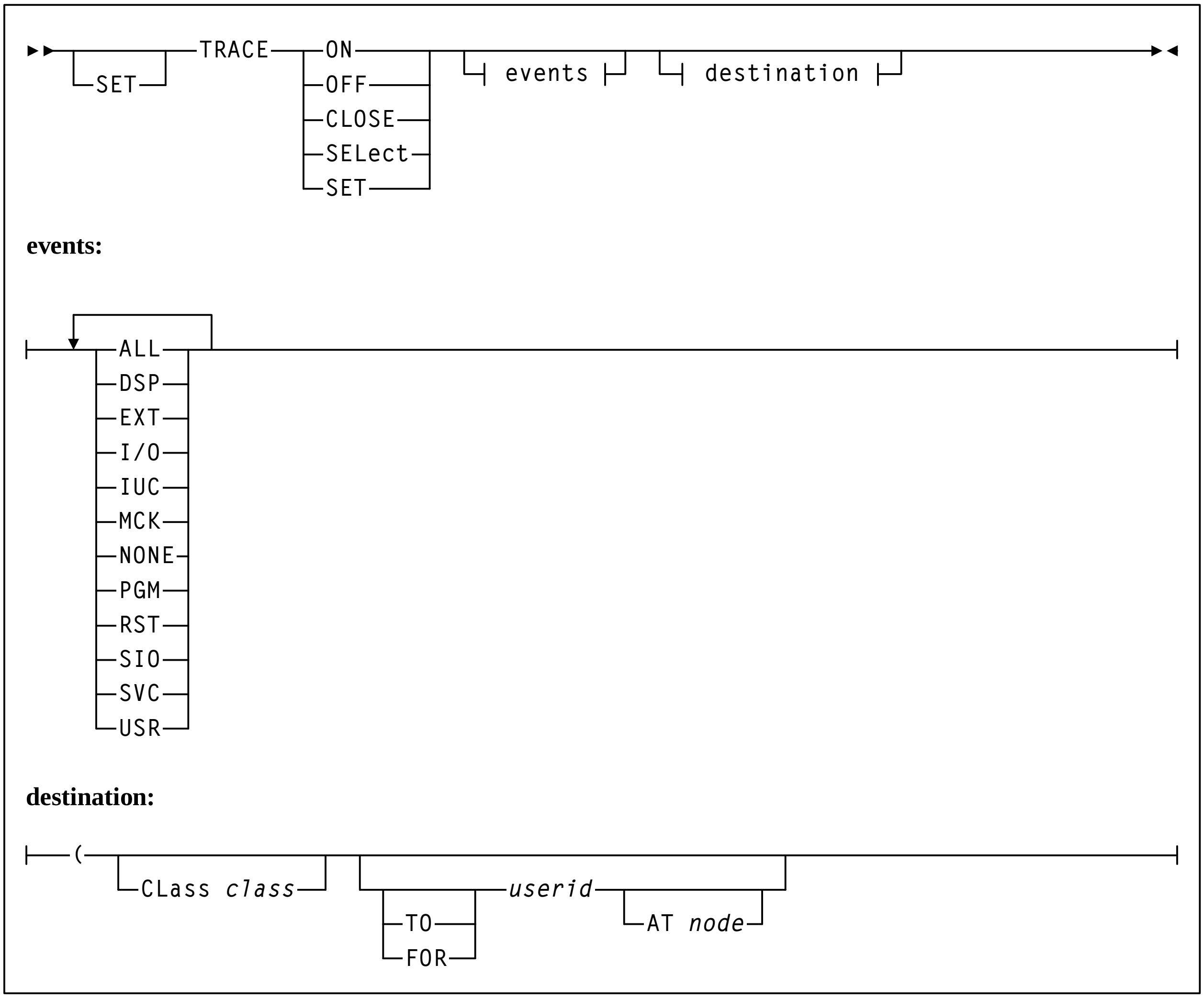
```
PERFLOG SMF HSC4 1Ø SUBTYPE(1,2,3,4,5,6,7)
```

SET TRACE Command

The SCP SET TRACE command allows the operator to enable and disable the control program execution trace feature. It is also known as the TRACE command.

This command interacts with the HSC TRACE command. The SCP TRACE command must have event USR enabled, and the HSC TRACE command must have some component enabled for tracing for there to be any HSC event tracing.

Syntax



Command Name

SET
optionally initiates the SET command.

Parameters

TRACE
initiates the SCP TRACE command.

ON
enables the program execution trace feature with the listed events and options.

OFF
disables the program execution trace feature and saves the listed events and options.

CLOSE
indicates that the trace file is to be closed. The ON/OFF status is unchanged. If TRACE is ON the trace log file is automatically reopened.

SELect or SET
indicate that the list of traceable events and trace log destination are to be saved. Tracing status (ON/OFF) is not affected. The new events list immediately replaces the old list, even if the list is changed while tracing is ON.

events
indicates which events are to be traced, expressed as a list separated by blanks. If no events are specified, the current events list is not altered. Processing is left to right, so 'SIO NONE EXT' is equivalent to just 'EXT'.

ALL	trace all events
DSP	task dispatched and return from DSP event
EXT	external interrupt
I/O	I/O interrupt
IUC	IUCV instruction
MCK	machine check interrupt
NONE	trace no events
PGM	program check interrupt
RST	restart interrupt
SIO	start I/O
SVC	SVC interrupt and return from SVC event
USR	user (GTRACE) invocation

CLass
indicates the CP SPOOL class to be used to transfer the file to its destination. The initial setting is class T.

class
is the class.

TO or FOR
optionally indicates the file is to be sent to a specified virtual machine. The initial setting is TO the current user ID (''*'').

userid
is the name of the virtual machine that is to receive the file.

AT

indicates the network node name of the virtual machine that is to receive the file. The default is the current host.

node

is the network node name.

Example

The following example illustrates the use of the SET TRACE command.

Enable Tracing of User Invocation

```
SET TRACE ON USR
```

SLK Command

The SLK command may be used to force interpretation of a command as an SCP command. It is the counterpart to the CP command supported by CMS.

Syntax

```
►►─SLK─scp-command──────────────────────────────────────────────►◄
```

Command Name

SLK
initiates the SLK command.

Parameters

scp-command
is interpreted by the command processor as an SCP command string. If it is not a valid SCP command, it is rejected.

scp-command
is required and it cannot be any of the following commands: ‘‘*’’ (comment), ‘‘SLK,’’ or any command to a subsystem.

Example

The following example illustrates the use of the SLK command.

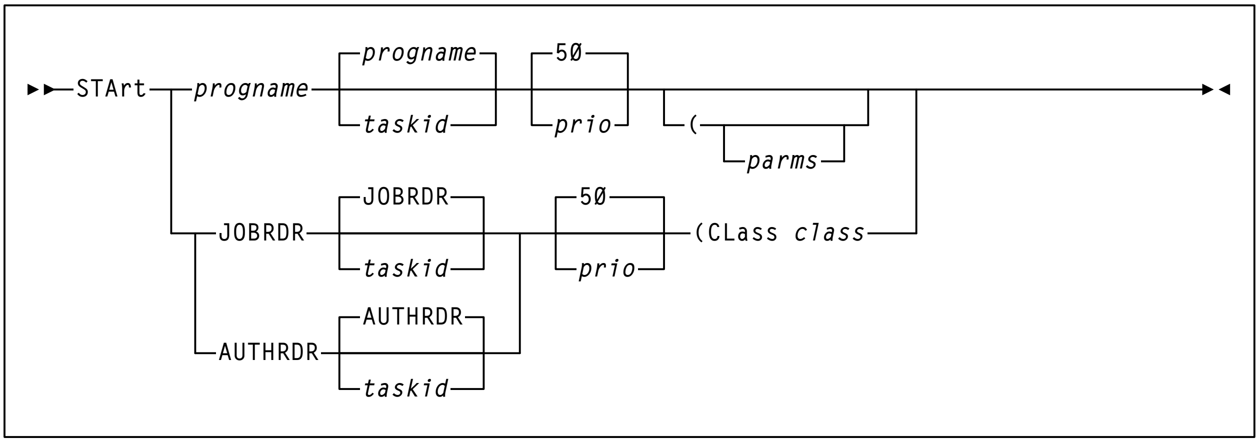
Issue the Query Trace Command Using the SLK Command

```
SLK QUERY TRACE
```

START Command

The STArt command allows the operator to initiate a named task or a job initiator. An initial task priority may be assigned. Any supplied parameter string is passed to the task started.

Syntax



Command Name

STArt
initiates the STArt command.

Parameters

progname
identifies the program/module to be executed.

parms
lists the (task-dependent) parameters to be passed to the given task. The parameter starts with the first nonblank character after the parenthesis ‘‘(‘’ and ends with the last nonblank character. Case is respected (that is, it is not forced to uppercase). It may contain no more than 100 characters.

JOBRDR
starts an unauthorized (8 ¢ key < 14) job initiator to process JCL files. There may be up to six JOBRDRs defined at a time.

AUTHRDR
starts an authorized (2 ¢ key < 8) job initiator to process JCL files. There may be up to six AUTHRDRs defined at a time.

CLass

specifies which spool class of virtual reader files to process. There is no default. If multiple job initiators are defined to use the same class, they will compete for newly arriving jobs.

Caution: Class should not be A, B, C, P, T, or 0 to avoid problems with other SCP components or the files sent by the CMS SENDFILE command. class is the spool class.

taskid

identifies the name to be assigned this particular invocation. If you do not supply a taskid, the progname is used. Duplicate taskids are rejected.

Active taskids are provided in the Name field of the output from the Query Active command (see “QUERY Command” on page 265).

prio

is the initial dispatching priority to be assigned to the task. The default is 50. It must be a one- or two-digit decimal number such that

(best) $0 < prio + 28 < 99$ (worst)

The actual running priority is determined by adding 28 to the prio parameter.

Example

The following example illustrates the use of the STArt command.

Start an Authorized Task With Class L

```
START AUTHRDR LIBRARY 30 (CLASS L
```

Class should not be A, B, C, P, T, or 0 to avoid problems with other SCP components or the files sent by the CMS SENDFILE command. class is the spool class.

STOP Command

The STOP command allows the operator to terminate an initiator or task in a controlled manner. A message is issued after it has been terminated.

Syntax

```
►►─STOP──taskid──────────────────────────────────────────────────────►◄
```

Command Name

STOP
initiates the STOP command.

Parameters

taskid
is the name of a task to be shutdown. Only the named task (and its subtasks) are terminated.

Active taskids are provided in the Name field of the output from the Query Active command (see “QUERY Command” on page 265).

Example

The following example illustrates the use of the STOP command.

Terminate Task HSC4 STOP HSC4

```
STOP HSC4
```

STOPSCP Command

The STOPSCP command lets you terminate all tasks in a controlled manner. If you are logged on to the service machine, you can specify that the service machine either logs off or re-IPLs after all tasks terminate. If the service machine is running disconnected, it always logs off after all tasks terminate.

Syntax

```
            ┌─(REIPL──┐
►►─STOPSCP──┤         ├──────────────────────────────────────────────────────►◄
            └─(LOGOFF─┘
```

Command Name

STOPSCP
initiates the STOPSCP command.

Parameters

LOGOFF
terminates all tasks and then logs the service machine off.

REIPL
terminates all tasks and then initiates an IPL CMS. The service machine control program is restarted. Any commands in the profile are executed to start any tasks automatically.

Note: If you are logged on to the service machine, you can specify either the LOGOFF or REIPL parameter. If the service machine is running disconnected, it always logs off after all tasks terminate (the REIPL parameter is not valid).

Example

The following example illustrates the use of the STOPSCP command.

Terminate All Tasks and then Log the Service Machine Off

```
STOPSCP (LOGOFF
```

SUBSYS Command

The SUBSYS command may be used to define an MVS-like subsystem, and optionally execute a subsystem initialization routine with parameters.

The following subsystems are defined and initialized internally:

MSTR
: This includes all of the system tasks (READ, WRITE, CMDPROC, TRACE, PERFLOG, and SENSE).

DIAG
: The diagnostic subsystem is not usually present. It is only used by authorized StorageTek service personnel.

JES2
: No MVS JES2 functions are supported. A JES2 SSCT is only provided for the HSC subsystem to locate its own LVT via its SSCT.

Note: The HSC subsystem is defined automatically at initialization via the LIBSUBSYS parameter in the SYSPROF.

Syntax

```
►►─SUBSYS──sysname─┬─────────────────────────┬──────────────────────────►◄
                   └─initpgm─┬──────────┬────┘
                             └─(parms───┘
```

Command Name

SUBSYS
: initiates the SUBSYS command.

Parameters

sysname
: is the subsystem name. It may be any string of 1 to 4 characters, except one of these reserved names: MSTR, JES2.

initpgm
: is the name of an optional initialization program to be loaded. If the SCP cannot locate the program, the subsystem will still be defined.

parms
: are optional parameters that are passed to the initialization program in uppercase.

Example

The following example illustrates the use of the SUBSYS command.

Define Subsystem HSC4

```
SUBSYS HSC4
```

GCS Component Server Commands

SLKGCS Command

The SLKGCS command is used for starting, displaying the status of, and stopping the GCS server component.

Syntax

```
►►─SLKGCS──┬─START───────┬──────────────────────────────────────────────►◄
           ├─DISPLAY─────┤
           ├─STOP────────┤
           └─CANCEL──────┘
```

Command Name

SLKGCS
initiates commands to the GCS component service machine.

Parameters

START
starts the GCS server component system and enables it for IUCV connections to establish host-to-host communications.

DISPLAY
displays the status of the GCS server component system. The status display includes the following:

- task status and activities
- IUCV path IDs and status
- active VTAM and IUCV exits (if any).

STOP
begins an orderly shutdown of the GCS server component system, disabling it for IUCV connections and terminating host-to-host communications.

CANCEL
causes an immediate abend of the GCS server component system, terminating host-to-host communications.

Examples

The following examples illustrate the use of the SLKGCS command.

Start the GCS Server Component System

```
SLKGCS START
```

Shutdown the GCS Server Component System in an Orderly Manner

```
SLKGCS STOP
```

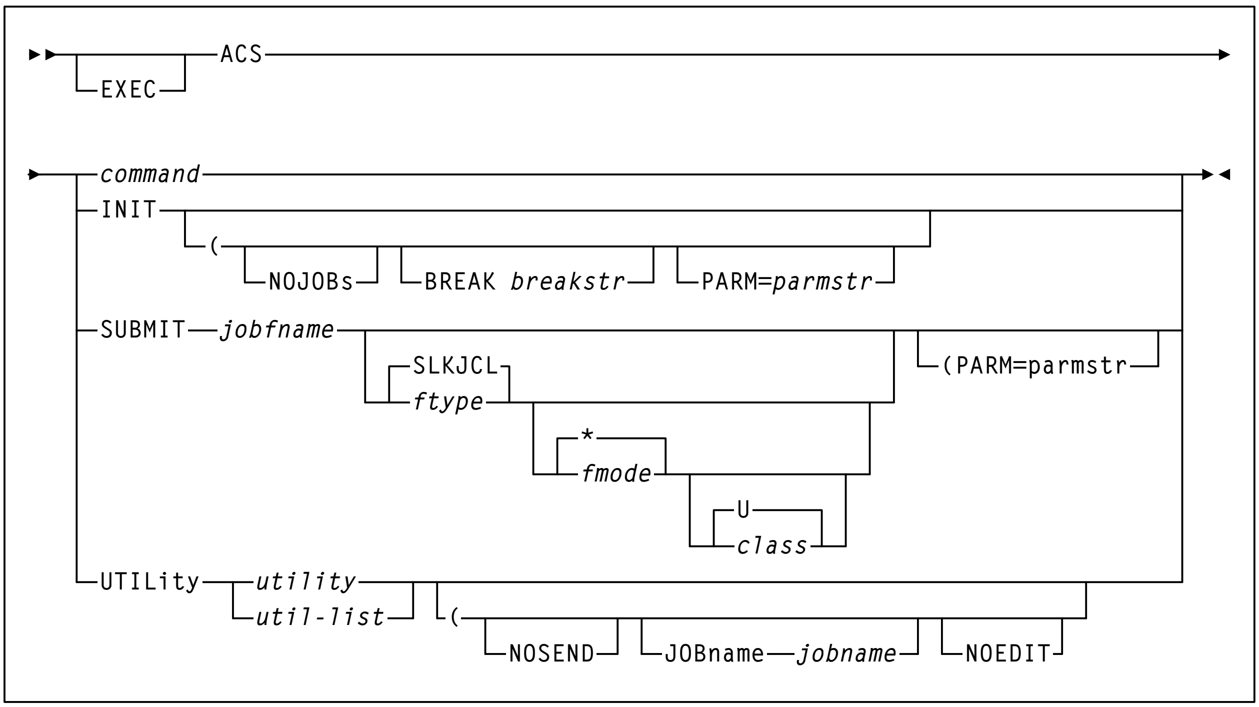
CMS Operator Commands

ACS EXEC

The ACS EXEC is the primary user interface to the ACS service machine. It provides several key functions.

- Transmits commands to the ACS service machine # Initializes the SCP and the HSC on the ACS service machine
- Sends batch jobs to the ACS service machine
- Creates utility job streams with JCL and control statement templates.

Syntax



EXEC Name

EXEC
can optionally be specified to invoke the EXEC.

ACS
initiates the ACS EXEC.

Parameters

command
is any command string to be sent to the ACS service machine. The first blank-delimited token may not be any of the following ACS EXEC subcommands:

- INIT
- SUBMIT
- UTILity

INIT

invokes SCP initialization using the system profile.

NOJOBs

optionally causes any AUTOJOB statements in the SYSPROF file to be ignored (that is, no jobs are submitted automatically).

BREAK

optionally causes a set of program breakpoints to be set.

Note: Refer to the =HPER command in the *HSC System Programmer's Guide* for a description of breakpoint specification.

breakstr

identifies a set of program breakpoints. Refer to "Problem Determination, Diagnostics, and Recovery" in the *HSC System Programmer's Guide* for details on setting breakpoints.

PARM

appends new parameter to an existing /PARM statement, or adds a /PARM statement in the job file(s) defined by the AUTOJOB statement(s) in the SYSPROF file.

parmstr

defines the parameters to be part of the /PARM in the job file(s). Refer to "HSC Control Statements and HSC Start Procedure" in the *HSC System Programmer's Guide* for a description of the /PARM statement.

SUBMIT

sends a CMS file to the ACS service machine named in system profile variable ‘‘ACSNAME.’’

jobfname

is the CMS file name of the job file.

ftype

is the CMS file type of the job file. The default file type is SLKJCL.

fmode

is the CMS file mode of the job file. The default file mode is * (all CMS disks currently addressed).

class

optionally specifies a spool class. The default class is ‘‘U.’’

PARM

appends new parameter to an existing /PARM statement, or adds a /PARM statement in the job file(s) defined by the AUTOJOB statement(s) in the SYSPROF file.

parmstr

defines the parameters to be part of the /PARM in the job file(s). Refer to "HSC Control Statements and HSC Start Procedure" in the *HSC System Programmer's Guide* for a description of the /PARM statement.

UTILity

creates a file containing JCL and utility statement templates to be modified (edited) by the caller. The templates are created from parameters defined in the system profile (SYSPROF) which must be on any accessible disk.

Requests for utilities which execute in the CMS environment are placed into ACSCMS EXEC with appropriate default parameters.

If the NOSEND option is not specified or is implied, the file is then filtered and sent to the ACS service machine and/or ACSCMS EXEC is executed.

utility or ***util-list***

specifies one or more names of library utilities. The names in a list must be separated by blanks.

The following utility names may be specified (uppercase letters denote the minimum abbreviations):

ACTIVities	activity distribution report.
ACTIVity	activity distribution report.
AUDIT	audit library contents.
BACKup	backup the library control data set.
DIRBLD	rebuild the CDS directory
EJECt	eject a list of volumes.
ENTEr	enter volumes through the CAP.
HSCINIT	create HSC startup job.
IVP1 JCL	for installation verification.
LIBGen	decompile the LIBGEN database.
MOVe	move cartridges within one or more LSMs.
OFFLoad	offload a journal data set.
RECONfig	reconfigure the library subsystem.
REPLaceall	replace the scratch volume list.
RESTore	restore control data set from a backup.
SCRAtch	change volumes to scratch status.
SCREdist	scratch volume redistribution.
SET	change library configuration information.
SLICREAT	library control data set creation.
SLIMDisk	allocate an OS-format data set on a minidisk.
SLIVInt	initialize a volume in OS format.
SLSBINIT	create HSC startup job.
SLUACtv	activity distribution report.

SLUETRac	format trace records.
SLUPErf	reblock performance log data.
TREQCOPY	initialize TAPEREQ statements data set.
TRAce	format execution trace data.
UNITCOPY	initialize UNITATTR statements data set.
UNSCratch	change volumes to nonscratch status.
UNSElect	unselect a volume that was left selected by HSC.
VOLCOPY	initialize VOLATTR statements data set.
VOLRpt	volume location report.

NOSEND
optionally specifies that the file is not to be sent to the ACS service machine.

JOBName
indicates a job name is to be placed on the /JOB card. jobname specifies the job name.

NOEDIT
optionally specifies that the file is to be created without being displayed in XEDIT mode. This implies the NOSEND option.

Examples

The following examples illustrate the use of the ACS EXEC.

Create the SLICREAT Utility Job Stream

```
ACS UTIL SLICREAT (NOSEND
```

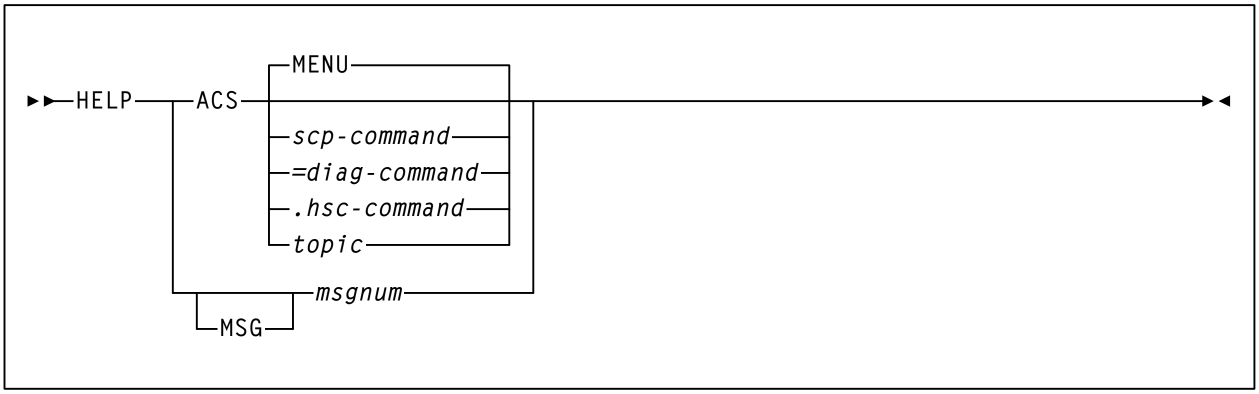
Submit the SLICREAT Job

```
EXEC ACS SUBMIT SLICREAT SLKJCL A U
```

CMS HELP Command

In the CMS environment, the CMS HELP command may be used to display information about the ACS.

Syntax



Command Name

HELP
initiates the CMS HELP command.

Parameters

ACS
initiates a request for help information about ACS commands or utilities. If you do not specify another parameter, a menu of help information is displayed.

MENU
requests a menu of help information be displayed. MENU is the default.

scp-command
indicates that information is to be displayed about the named SCP command.

ACS	ASCPROP	AUTHORIZ	CANCEL
CMSHELP	COMMENT	CONSLOG	CP
DEFINE	DUMP	DUMPOPTS	FILE
HELP	MSGTYPE	PERFLOG	QUERY
REPLY	SET	SLK	START
STOP	STOPSCP	SUBSYS	TRACE

=diag-command
indicates that information is to be displayed about the named diagnostic command.

=DDICT =DEBUG =HPER =NODEBUG =WHERE .

hsc-command

indicates that information is to be displayed about the named HSC command.

.CAPPREF	.CDS	.CLEAN	.COMMPATH
.DISMOUNT	.DISPLAY	.DRAIN	.EJECT
.ENTER	.JOURNAL	.MNTD	.MODIFY
.MONITOR	.MOUNT	.MOVE	.OPTION
.RECOVER	.RELEASE	.SCRPARM	.SENTER
.SET	.SRVLEV	.STOPMN	.SWITCH
.TRACE	.VARY	.VIEW	.WARN

Note: Help for HSC commands is also available using the HSC Display command. Refer to “DISPLAY Command” on page 62 for details on the Display command syntax and parameters.

topic

indicates that information is to be displayed about the named topic. Topics include (but are not limited to) IPCS functions provided and SCP utilities.

DUMPSCAN	JCL	PRTDUMP	SLIMDISK
SLIVINT	SLUACTV	SLUETRAC	SLUIPCS
SLUPERF			

MSG

optionally initiates a request for help information about a given message.

msgnum

is the message number. Only the system message prefix (SLK or SLS), message number, and the message type portions of the message ID should be given. All messages within a system (SCP or HSC) have been assigned a unique decimal number.

Examples

The following examples illustrate the use of the CMS HELP command.

Display Help Information on the AUTHoriz Command

```
HELP ACS AUTHORIZ
```

Display Help Information on SCP Message SLKxxx108I

```
HELP MSG SLK1Ø8I
```

Library Utilities Overview

Utilities are programs that help manage library resources. This section presents brief descriptions of the functions performed by library utilities. The *HSC System Programmer's Guide* provides a complete description of each utility.

Activities Report Utility

This utility provides a statistical report on library resource loading by volume groups (that is, scratch vs. nonscratch, pass-thru activity, mounts, dismounts, entered, and ejected). This report provides necessary information to monitor library resources and usage.

Audit Utility

This utility performs a physical inventory of library volumes in specified locations, such as:

- the entire library
- an ACS
- one or more specified LSMs within an ACS
- one or more panels within an LSM
- one or more rows within a panel
- one or more columns (cells) within a row.

Optional parameters allow you to

- update the library control data set to reflect cartridges observed
- produce a discrepancy list and do not update the control data set.

Backup Utility

This utility produces a backup of the library control data set. If journaling is enabled, all journals are reset when the backup is complete.

Database Decompile Utility

This utility provides a way to create a complete LIBGEN database from an existing control data set.

Directory Rebuild Utility

This utility provides a means to rebuild the database directory as well as reconstructing database areas unique to HSC 2.0.

Eject Cartridge Utility

This utility ejects cartridges from the library in a batch mode. The control statement accepts a list of one or more specific VOLSERs, or a count of scratch volumes from a specified scratch subpool, and allows you to specify one or more CAPs. The robot retrieves the indicated cartridges and places them in the designated CAPs. Ejected cartridges are deleted from the control data set.

Enter Cartridge Utility

This utility accepts cartridges through the CAP and returns a printed list of the volumes entered. The list may then be used to initialize, scratch, or eject the volumes.

Journal Offload Utility

This utility allows you to off-load one or both journals on a given host without backing up the control data set. The journals are backed up and reset.

Move Utility

This utility allows you to request the HSC to move a single volume, a range of volumes, or a list of volumes to other locations within an ACS.

Performance Log Reblocker Utility

This utility prepares the generated performance log (SMF data) for use by the Activities Report utility.

POST VOLSER to Location Utility

This utility determines the location of a volume in the library. The utility is primarily for recovery purposes when VM or the SCP is not operational and a particular volume must be located.

Reconfig Utility

This utility creates a new control data set when the library hardware configuration changes. Cartridge location information is retained from the original control data set.

Restore Utility

This utility re-creates the library control data set from a previous backup copy and, if desired, applies all journals since the last backup, if journaling is enabled.

Scratch Redistribution Utility

This utility balances the number of scratch cartridges among selected LSMs connected by pass-thru ports. It does this by moving scratch tapes from LSMs with higher concentrations to those with lower concentrations, until the number of scratch volumes in each LSM is within a range specified either by the utility or the SCRparm operator command.

Scratch Update Utilities

These utilities provide three basic functions:

- Scratch utility - allows you to scratch a volume, a range of volumes, or a list of volumes.
- Unscratch utility - allows you to unscratch a volume, a range of volumes, or a list of volumes. The entire scratch list in the control data set can be deleted by using this utility.
- Replace utility - allows you to add a volume, a range of volumes, or a list of volumes to the scratch list in the control data set. The additions are made after an initial clearing of the scratch list.

Set Utility

This utility allows a system programmer to change certain library configuration information without performing a reconfiguration on the library. It performs operations directly on the control data set and does not require the HSC to be active.

Unselect Utility

This utility allows you to unselect a volume that has been left in a selected state by the HSC. Unselect is used only when the HSC has erroneously left a volume in a selected state.

Volume Report Utility

This utility produces a listing of all volumes in one or more LSMs. Volume Report can be run as a stand-alone utility. The following information is provided by the report:

- volume serial number
- location of volume
- errant volume status
- volume scratch status
- volume selected status
- volume mount status
- volume label status
- date/time that volume was inserted into the library
- date/time that volume was last selected
- number of times volume was selected
- CDS data
- summary.

The utility provides an option to produce an output flat file of volume and/or other CDS data that can be used by another program.

Control Program Utilities

The following control program utilities are available.

SLIMDISK Utility

This utility allocates data sets on minidisks which appear as OS-formatted or CMS RESERVED disks.

SLIVINT Utility

This utility initializes minidisks to appear as OS-formatted disks.

SLUETRAC Utility

This utility formats execution trace data for viewing or printing.

SLUPERF Utility

This utility converts performance log records into the format required for the Activities Report utility.

Chapter 3. Operating an Automated Cartridge System

This chapter describes the procedures for operating an Automated Cartridge System. The following topics are discussed:

- LSM automatic mode
- LSM manual mode
- LSM mixed (automatic and manual) mode
- returning the LSM to automatic mode
- LMU operation
- SL8500 LC operation.

LSM Automatic Mode

When an LSM is online, it is in automatic mode, which means that the robot is fully operational and is able to perform all cartridge handling activities. In this mode, no operator intervention is required for mounting, dismounting, swapping, or inter-LSM cartridge movement. However, operators must occasionally monitor console messages and respond accordingly to ensure that the library continues efficient operation.

Automatic mode is the normal operating mode of an LSM. For information on how to operate in manual mode, see “LSM Manual Mode” on page 305.

The most common functions that an operator must perform when an LSM is in automatic mode are:

- entering cartridges into the LSM through the CAP
- ejecting cartridges from the LSM through the CAP
- entering a cartridge when the eject routine is in progress
- visually inspecting an LSM component.

The procedures you must follow to enter and eject cartridges depend on the CAP hardware and software installed in your library, and the CAP mode setting. Make sure you are familiar with the CAP displays and indicators and understand CAP functions before attempting the procedures described in this chapter.

Refer to the appropriate StorageTek hardware operator’s guide for instructions on how to open, close, and insert cartridges into the various CAPs, and for descriptions of CAP indicators and operator panels.

CAP Display Panels

Display panels describe the state of each CAP and the operation (if any) in progress. Displays are similar between different CAPs, but there are some differences that you must be aware of. See the appropriate StorageTek hardware operator’s guide for CAP information.

CAP Modes

The HSC CAPPref command allows you to set the CAP mode to either manual or automatic. (Refer to “CAP Preference (CAPPref) Command and Control Statement” on page 41 for details on command syntax and parameters.)

- an automatic mode CAP (referred to as an *auto-mode* CAP) allows you to enter cartridges into an LSM without using HSC commands or utilities. Any CAP can be placed in automatic mode, which unlocks the CAP makes it available for entering cartridges.

- a manual mode CAP is normally locked and can only be used by issuing HSC commands or utilities.

Entering Cartridges Into an LSM

Refer to the appropriate StorageTek hardware operator's guide for procedures detailing how to enter cartridges into the LSM through the CAP and how to place cartridges in CAPs.

In auto-mode CAPs, no HSC commands or utilities need be entered. In a manual CAP, users must specify the following operator command prior to opening the CAP:

```
ENter cap-id
```

Refer to "ENTER Command" on page 159 for more information.

Note: To discontinue this operation, issue the DRAin operator command (refer to "DRAIN CAP Command" on page 138).

Ejecting Cartridges From the LSM

An operator can eject cartridges from an LSM using either the EJect command or EJECt utility. Procedures vary according to the type of CAP being used: standard, enhanced, or PCAP. Refer to the appropriate StorageTek hardware operator's guide for more information.

- The EJect command allows you to specify one or more CAPs and eject up to 9999 cartridges. Refer to "EJECT Command" on page 142 for details on command syntax and parameters.
- The EJECt utility allows you to specify one or more CAPs and eject any number of cartridges. Refer to the *HSC System Programmer's Guide* for details on the EJECt utility.

For an eject operation, you must issue the EJect command or EJECt utility prior to opening the CAP:

```
EJect (vol-list) (cap-list)
```

or

```
EJECt VOLser(vol-list) CAP(cap-list)
```

Notes:

- The eject operation terminates automatically when all specified cartridges have been processed.
- If you want to terminate an eject operation before the eject completes, enter the DRAin command (refer to "DRAIN CAP Command" on page 138). The disposition of volumes associated with drained CAPs is determined by the OPTion Repath command setting. Refer to "OPTION Command and Control Statement" on page 197.

Entering a Cartridge During an Eject Routine

There may be times when all CAPs are allocated for eject operations. Users can schedule an enter on an allocated CAP using the SENter command:

```
SENter cap-id
```

The command must be issued from the host that has the CAP allocated for ejects. Refer to “SENTER Command” on page 209.

Visually Inspecting an LSM Component

Using the VIew Command

If video monitors are attached to the LSM, you can visually inspect internal components, without physically entering the LSM, using the VIew command. The command directs the robot to position one of its cameras at a selected component for a specified period of time.

Note: The VIew command is not supported for SL3000 and SL8500 libraries, which do not contain lights or cameras.

Refer to “VIEW Command” on page 229 for syntax and parameter information.

The VIew command requires dedicated use of the robot while a component is being inspected. The robot is not available for other work during this time.

Opening an LSM in Automatic Mode

Refer to the procedure described in the appropriate StorageTek hardware operator’s guide.

Warning: Read the entire procedure before you attempt to enter the LSM.

LSM Manual Mode

If an LSM cannot operate in automatic mode, the robot does not mount and dismount cartridges automatically. The operator must enter the LSM and mount and dismount cartridges manually.

Caution:

- **StorageTek strongly recommends that you do not place SL3000 or SL8500 libraries in manual mode.** To use manual mode, all LSMs in the SL3000 and the SL8500 must be offline, and that means all CAPs and drives are unavailable for automated operations.

  Additionally, SL3000 and SL8500 libraries have been designed for high cartridge density, so there is limited room for manually mounting and dismounting cartridges.

  Refer to the “Precautions” topic in the *SL3000 Modular Library System User’s Guide* or *SL8500 Modular Library System User’s Guide* for safety requirements and physical restrictions if you decide that you must enter the library.

- **Do not** run the Vary command from the SLConsole (SLC) when the HSC is active. Varying LSMs offline through the SLC places the affected LSMs in a NOT READY state, which can lead to disrupted library operations. Instead, when you want to modify an LSM OFFLINE, run the MODify command.

It is not always necessary to modify the LSM offline and place it in manual mode just to open the LSM access door for a quick inspection of a drive or other component. See “Visually Inspecting an LSM Component” on page 304.

This section describes the following procedures for operating an LSM in manual mode:

- determining that the LSM is not in automatic mode
- placing the LSM in manual mode
- setting manual mode attributes
- resetting the transport display
- locating a cartridge in the LSM
- operating in manual mode with HSC at base service level
- how to handle manual mount requests
- how to handle manual dismount requests.

Figure 3 on page 306, Figure 4 on page 307, and Figure 5 on page 308 provide a flow chart for manual mode operations. All diagrammed steps are described in the pages that follow.

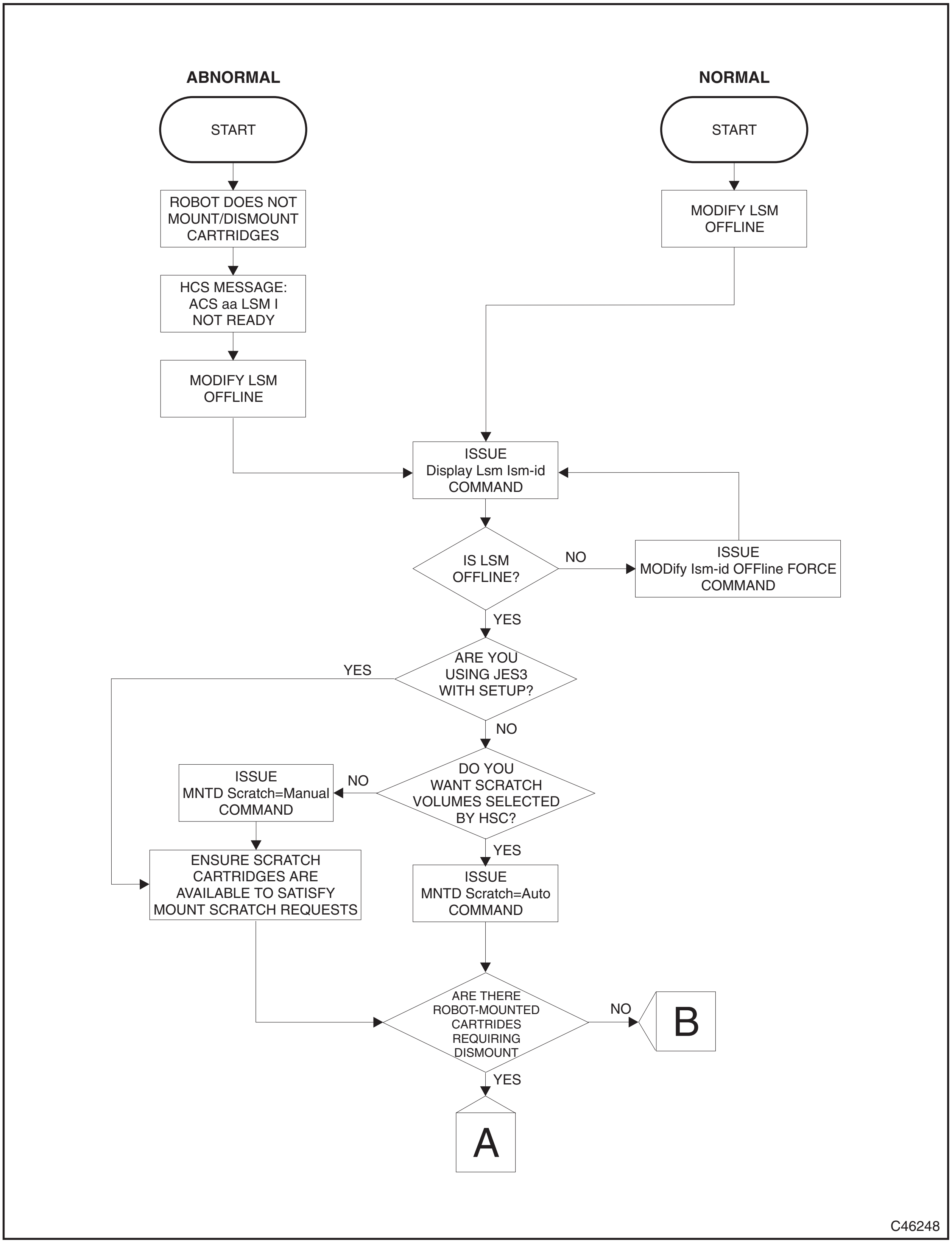


Figure 3. Manual Mode Flow Chart - Entering Manual Mode

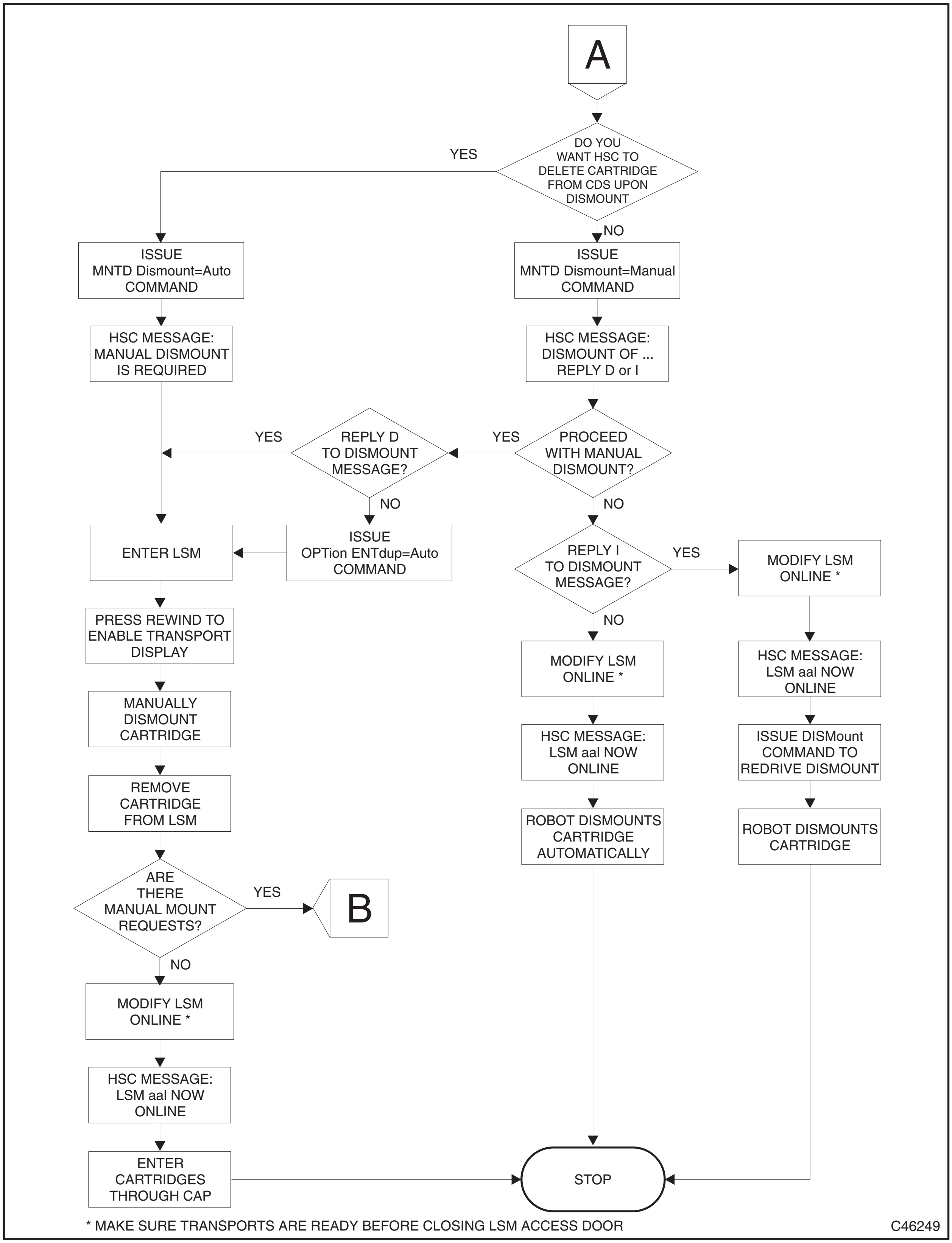


Figure 4. Manual Mode Flow Chart - Manual Dismount After Automatic Mount

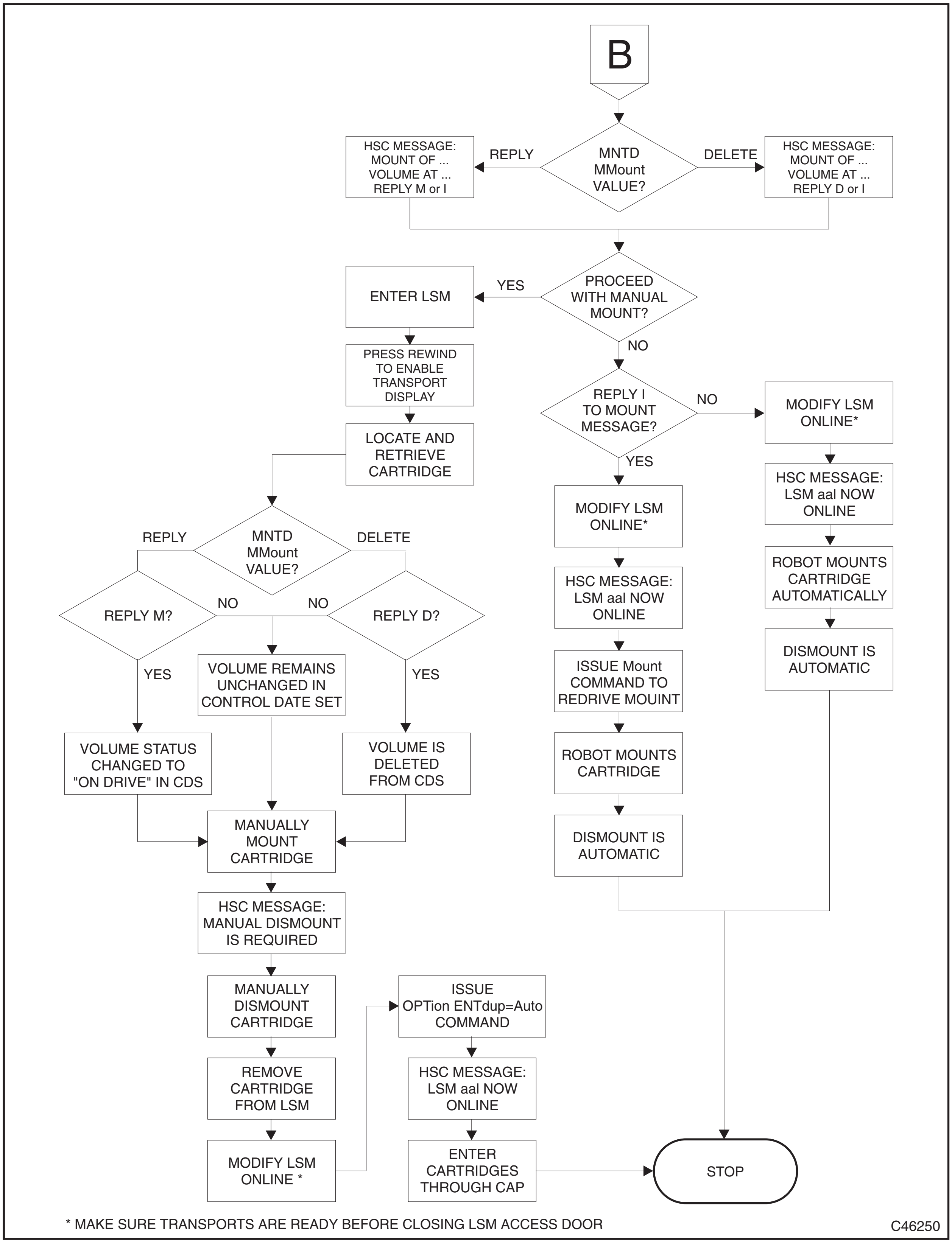


Figure 5. Manual Mode Flow Chart - Manual Mount/Dismount

Determining That the LSM is Not in Automatic Mode

There is no one definite indication that there is a need to operate in manual mode; experience best dictates when to act. However, there are signs that indicate when an LSM is not functioning in automatic mode:

- The LSM access door is open.
- The robot does not automatically mount and dismount cartridges.
- The HSC issues a console message informing the operator that an LSM is ‘‘not ready,’’ indicating a problem has been detected in the LSM. The message identifies the LSM and provides a reason code for the failure. Refer to the *HSC Messages and Codes Guide* for an explanation of the reason code.

Display LSM Status

If you suspect that the LSM is not functioning in automatic mode, issue the following command at the console to display the status of the LSM:

```
Display Lsm lsm-id
```

The status display indicates ‘‘not ready’’ if the LSM is not functioning in automatic mode. Refer to “Display LSM” on page 96.

Dual LMU Environment

ACS requests cannot effectively be automated if all stations are offline to the LMU, or if all online station paths are inoperative. In a dual LMU environment, if all online station paths to the master LMU are inoperative, use the HSC SWitch command to move the workload to the standby LMU (refer to “SWITCH Command” on page 216 for details on command syntax and parameters).

SL8500 Redundant Electronics Environment

Library requests cannot be automated if all network connections paths are offline to the Library Controller (LC) or if all network connection paths are inoperative. In a Redundant Electronics environment, if all network connection paths to the active LC are inoperative, use the HSC SWitch command (see page 228) to move the workload to the standby LC.

Placing the LSM in Manual Mode

Place the LSM in manual mode by issuing the following command at the console:

```
MODify LSM lsm-id OFFline
```

The LSM remains in manual mode until the LSM is modified online. Refer to the "MODIFY Command" on page 174.

Caution: StorageTek strongly recommends that you do not place SL3000 or SL8500 libraries in manual mode. To use manual mode, all LSMs in the SL3000 and SL8500 must be offline, and that means all CAPs and drives are unavailable for automated operations. Additionally, SL3000 and SL8500s have been designed for high cartridge density, so there is limited room for manually mounting and dismounting cartridges.

Refer to the "Precautions" topic in the *SL3000 Modular Library System User's Guide* for safety requirements and physical restrictions if you decide that you must enter the library.

Verify the LSM is Offline

You can verify that the LSM is offline by issuing the following command:

```
Display Lsm lsm-id
```

The status display indicates ''OFFLINE'' if the MODify command was successful.

Note: Placing the LSM offline does not cause the cartridge drives in the affected LSM to become offline.

Setting Manual Mode Attributes

To reduce the amount of operator intervention required, you may want to change the normal HSC processing for certain manual mode functions, depending on how long you expect the LSM to be offline. The following manual mode attributes can be controlled using the HSC MNTD commands:

- manual mode dismount processing for robot-mounted cartridges
- message processing for a manual mode mount
- selection of scratch volumes during manual mode
- using the deferred mount option in manual mode.

Refer to "MNTD (Mount/Dismount Options) Command and Control Statement" on page 165 for details on command syntax and parameters.

Notes:

- The MNTD commands can be issued at any time during either automatic mode or manual mode, but the Dismount, MMount, and Scratch parameters only take effect during manual mode.
- Each option remains in effect until it is changed by another MNTD command.

Manual Mode Dismount Processing for Robot-Mounted Cartridges

Placing an LSM in manual mode does not cause the cartridge drives in the affected LSM to become offline. Jobs that are running when an LSM is modified offline continue without interruption. As the jobs complete, manual dismount requests are issued for cartridges that were mounted by the robot before the LSM was modified offline.

Normal HSC manual mode processing deletes a volume from the control data set when the dismount message is displayed. The HSC considers the dismount complete; it cannot be displayed as an outstanding request. This type of processing assumes the operator manually dismounts the cartridge and removes it from the LSM. Cartridges that are removed must be reentered after the LSM is modified online.

If an LSM is only going to be in manual mode for a short time, the operator can take control of these dismount requests by issuing the following command:

```
MNTD Dismount(Manual)
```

This directs the HSC to prompt for an operator decision whenever a dismount is requested for a robot-mounted cartridge. The following choices are available to the operator:

- manually dismount the cartridge and reply "D" to the dismount message. The cartridge is deleted from the control data set and must be removed from the LSM.
- reply "I" to the message to ignore the dismount. The dismount can be re-driven after the LSM is modified online by issuing the HSC DISMount command.
- make no response to the dismount message, which leaves the dismount request outstanding. The HSC automatically re-drives the dismount request when the LSM is modified online.

Use the Display MNTD command to display the current Dismount setting. Refer to “Display MNTD” on page 100 for details on command syntax and parameters.

Message Processing for a Manual Mode Mount

Normal manual mode processing requires the operator to respond to a highlighted manual mount message. If the operator responds ‘‘D’’ to the message and manually mounts the cartridge, the volume is deleted from the control data set.

You can change HSC manual mode mount processing to retain the volume information in the CDS until a dismount is requested by issuing the following command:

```
MNTD MMount(Reply)
```

This directs the HSC to prompt for an operator decision whenever a manual mount is requested. The following choices are available to the operator:

- reply ‘‘M’’ to the mount message and manually mount the cartridge. The cartridge is retained in the control data set and its status is changed to ‘‘on drive.’’
- reply ‘‘I’’ to the message to ignore the mount. The mount can be re-driven after the LSM is modified online by issuing the HSC Mount command.
- make no response to the mount message, which leaves the mount request outstanding. The HSC automatically re-drives the mount request when the LSM is modified online.

Use the Display MNTD command to display the current MMount setting. Refer to “Display MNTD” on page 100 for details on command syntax and parameters.

Selection of Scratch Volumes During Manual Mode

Normal manual mode processing requires the operator to select a scratch volume to satisfy a mount scratch request. This may require you to obtain a volume report or issue several Display commands to locate scratch cartridges in the LSM.

You can direct the HSC to select scratch volumes for you by issuing the following command:

```
MNTD Scratch(Auto)
```

The volume must still be mounted manually, but now the HSC selects the volume and issues a message which provides the VOLSER and cell location of the cartridge.

Use the Display MNTD command to display the current Scratch setting (refer to “Display MNTD” on page 100 for details on the Display command).

Notes:

- If scratch processing is set to Auto but there are no scratch volumes contained in the LSM, you must select a scratch volume from outside the manual mode LSM.
- Refer to “WARN Command” on page 238 for information on how to ensure that adequate scratch volumes are maintained in LSMs.

Resetting the Transport Display

At the beginning of manual mode operation each transport is in a Hold Off Load condition. In this condition, the message display panel above the transport is blank and the transport does not load if a cartridge is mounted. **This condition must be cleared before mounting cartridges manually.**

Refer to the appropriate StorageTek hardware operator’s guide for instructions on reactivating the transport display and clearing the Hold Off Load condition.

Locating a Cartridge in the LSM

The cartridge VOLSER and cell location are provided in a console message.

Cartridge Location in the Console Message

The HSC manual mount message provides the VOLSER and cell location of the cartridge, and the address of the transport allocated for the mount. Before entering the LSM, write down the VOLSER, cell location, and transport address.

The format of the cell location is:

```
AA:LL:PP:RR:CC
```

where:

AA:LL
is a hexadecimal number designating an LSM.

PP
is a decimal number designating an LSM panel.

RR
is a decimal number designating a row in the panel.

CC
is a decimal number designating a column in the row.

An example of the location displayed is:

```
... Manual volume at 00:00:13:01:19; ...
```

In the example, the cartridge is located in LSM 00:00, panel 13, row 01, column 19.

Refer to the appropriate StorageTek hardware operator’s guide for information on how panels, rows, and columns are numbered.

Cartridge Location on the Message Display Panel

Once the operator has replied to the manual mount message, inside a manual mode LSM, the transport display panel alternately displays the VOLSER and cell location of the requested cartridge. The VOLSER appears as seven characters: the six-character volume serial number prefixed with an ‘‘M’’ indicating the transport is awaiting the mount.

The cell location appears in the following format:

	L	L	P	P	R	R	C	C	

where:

LL
designates an LSM.

PP
designates an LSM panel.

RR
designates a row in the panel.

CC
designates a column in the row.

An example of the location displayed is:

	0	1	0	7	1	1	1	5	

In the example, the cartridge is located in LSM 01, panel 07, row 11, column 15.

How to Handle Manual Mount Requests

Whenever a mount is requested for a volume residing in a manual mode LSM, the HSC immediately informs the operator that a manual mount is needed by issuing one or more messages to the console. Each message contains text, such as:

```
... Manual volume at ...
```

or

```
... manual mount is required ...
```

or

```
... Intervention required; ...
```

indicating that the cartridge must be mounted manually.

A highlighted message provides the cartridge VOLSER and cell location, and prompts the operator for a response. The choice presented to the operator depends on whether MNTD MMount is set to Delete or Reply (refer to "Message Processing for a Manual Mode Mount" on page 312).

- MNTD MMount(Delete) generates a manual mount message which prompts the operator to respond ''D'' or ''I.''
- MNTD MMount(Reply) generates a manual mount message which prompts the operator to respond ''M'' or ''I.''

The operator can also choose to not respond to the message. The operator response (or nonresponse) determines how the HSC processes the dismount.

Manually Mounting a Cartridge

To proceed with the manual mount, use the procedure that fits your environment.

Manual Mount Processing With MNTD MMount

When a manual mount message is issued and MNTD MMount(Delete) is in effect, the operator can either respond ‘‘D’’ (delete), “M” (reply), or make no reply to the message.

When the manual mount message is displayed on the console, refer to the appropriate StorageTek hardware operator’s guide to see the procedure for mounting a cartridge.

Note: For PGMI users, the volume information is returned before the cartridge is deleted from the control data set.

Not Performing the Manual Mount

To choose not to perform the manual mount, the operator can either reply ‘‘I’’ or make no reply to the manual mount message.

Ignoring a Manual Mount Request

To ignore the mount, respond ‘‘I’’ to the mount message. The HSC releases the mount request and the cartridge remains in the control data set.

After the LSM is modified online, the mount can be re-driven by issuing the HSC Mount command. The HSC does not automatically reprocess a mount request that has been ignored.

Not Responding to a Manual Mount Request

If plans are to place the LSM in automatic mode (modify online), the operator can choose to not respond to the manual mount message. The HSC queues the mount and waits for a response.

When the LSM is placed in automatic mode, the HSC automatically re-drives the mount request.

How Manual Mounts Affect the Control Data Set

The operator’s response to the manual mount message determines how the control data set is affected.

- A response of ‘‘D’’ (delete) logically ejects the volume from the control data set. Logical ejection is done to maintain the integrity of the control data set.
- A response of ‘‘M’’ (reply) allows the operator to manually mount the cartridge. The cartridge is retained in the control data set and its status is changed to ‘‘on drive.’’
- A response of ‘‘I’’ leaves the cartridge in the control data set.
- No response to the message leaves the cartridge in the control data set.

How to Handle Manual Dismount Requests

The following situations can occur when an LSM is in manual mode that may require operator intervention to manually dismount a cartridge:

- a dismount request for volume that was mounted by the robot before the LSM was placed in manual mode
- a dismount request for a volume that was manually mounted by the operator and MNTD MMount is set to Reply.
- a dismount request for a volume that was manually mounted by the operator and MNTD MMount is set to Delete.

The first two situations are handled identically.

Manual Dismounts After Robot Mount or With MNTD MMount(Reply)

The MNTD Dismount command controls HSC dismount processing for cartridges that were either:

- mounted by the robot, or
- mounted by the operator with MNTD MMount set to Reply.

Refer to "Manual Mode Dismount Processing for Robot-Mounted Cartridges" on page 311 for further information on using the MNTD command. Refer to "MNTD (Mount/Dismount Options) Command and Control Statement" on page 165 for details on command syntax and parameters.

MNTD Dismount(Auto)

If MNTD Dismount is set to Auto (the default), the HSC displays a manual dismount message that identifies the cartridge VOLSER and the transport address. The HSC immediately deletes the cartridge from the control data set. The operator must manually dismount the cartridge and remove it from the LSM.

MNTD Dismount(Manual)

If MNTD Dismount is set to Manual, the HSC displays a manual dismount message that identifies the cartridge VOLSER and the transport address, and prompts the operator to respond ''D'' (delete) or ''I'' (ignore).

Reply ''D'' to proceed with the manual dismount. Immediately enter the LSM, dismount the cartridge, and remove it from the LSM. The HSC deletes the cartridge from the control data set.

Reply ''I'' to ignore the dismount. The HSC releases the dismount request and the cartridge remains in the control data set. After the LSM is modified online, the dismount can be re-driven using the HSC DISMount command.

Do not reply to the message if you plan to modify the LSM online. The volume is dismounted automatically when the LSM is returned to automatic mode.

Manual Dismounts After Manual Mount With MNTD MMount(Delete)

After the system has finished processing a manually mounted cartridge, the HSC issues a dismount message identifying the transport address and the VOLSER of the cartridge to be dismounted. The message does not require an operator response.

Refer to the appropriate StorageTek hardware operator's guide for a description of how to dismount and store the cartridge.

How Manual Dismounts Affect the Control Data Set

Manual Dismount After Robot Mount With MNTD Dismount(Auto)

The HSC deletes the cartridge from the control data set.

Manual Dismount After Robot Mount With MNTD Dismount(Manual)

Manual dismounts of cartridges that were mounted by the robot cause the HSC to display a message on the console which prompts the operator to respond either ‘‘D’’ (delete) or ‘‘I’’ (ignore).

- A response of ‘‘D’’ deletes the cartridge from the control data set.
- A response of ‘‘I’’ leaves the cartridge in the control data set.
- No response to the message leaves the cartridge in the control data set.

Manual Dismount After Manual Mount With MNTD MMount(Delete)

The operator's response to the manual mount message determines how manual dismounts of manually mounted cartridges affect the control data set.

- If the operator replied ‘‘D’’ to the manual mount message, the cartridge was logically ejected from the control data set at mount time.

- If the operator made no reply to the message, the cartridge remains in the control data set.

Operating in Manual Mode With HSC at Base Service Level

Manual mount messages are not displayed when the HSC is functioning at the base service level. For this reason, manual mode operations are not recommended. If you must operate in manual mode with the HSC at base service level, refer to the appropriate StorageTek hardware operator's guide for information.

LSM Mixed (Automatic and Manual) Mode

If you are working in an automated LSM environment in which one or more of the LSMs are offline, you may need to remove a cartridge from a manual LSM and enter it into an automatic LSM, or to eject a cartridge from an automatic LSM and mount it on a drive that is attached to a manual LSM. When two automatic LSMs are separated by an offline LSM (in a linear configuration), you may also have to handle a mount between the two automatic LSMs manually.

Note: SL3000 and SL8500 libraries do not support manual mode.

The procedures that you follow sometimes depend upon whether MNTD MMount is set to Delete or Reply; however, this setting does not always matter.

This section describes how to handle mount requests in a mixed automatic and manual mode LSM environment.

- mounting a cartridge from a manual LSM to an automatic LSM
- mounting a cartridge from an automatic LSM to a manual LSM
- mounting a cartridge from one automatic LSM to another.

Mounting a Cartridge from a Manual LSM to an Automatic LSM

To proceed with the mount, use the procedure below that fits your environment. For this scenario, the MNTD MMount setting *does* matter.

Manual Mount Processing with MNTD MMount(Delete)

When a cartridge that resides in a manual LSM needs to be mounted on a drive that is attached to an automatic LSM, the HSC issues a manual mount message identifying the cartridge VOLSER, the address of the drive on which it is to be mounted, and the VOLSER's location in the manual mode LSM.

When the manual mount message is displayed on the console, do the following:

1. Refer to the appropriate StorageTek hardware operator's guide to see how to locate, remove, and enter the cartridge into the automatic LSM
2. You must respond "D" to the manual mount message to delete the cartridge from the control data set.
3. Issue the Mount command.

Manual Mount Processing with MNTD MMount(Reply)

When the HSC issues a manual mount message for a cartridge that resides in a manual LSM and MNTD MMount(Reply) is in effect, a response of ‘‘M’’ ultimately causes the mount to fail.

When the manual mount message is displayed on the console, do the following:

1. Reply ‘‘I’’ to the mount message.
2. Change the MNTD MMount setting to Delete.
3. Issue the Mount command, then follow the instructions provided in “Manual Mount Processing with MNTD MMount(Delete)” on page 320.
4. If desired, change the MNTD MMount setting back to Reply.

Mounting a Cartridge from an Automatic LSM to a Manual LSM

When a cartridge that resides in an automatic LSM needs to be mounted on a drive that is attached to a manual LSM, the HSC issues a manual mount message identifying the cartridge VOLSER and the address of the drive on which it is to be mounted.

When the manual mount message is displayed on the console, do the following:

1. Write down the VOLSER and the drive address.
2. Issue the EJect command to eject the cartridge from the automatic LSM.
3. Refer to the appropriate StorageTek hardware operator’s guide for instructions on how to remove the cartridge from the CAP, enter the LSM, and insert the cartridge into the transport.

Mounting a Cartridge from One Automatic LSM to Another

This section refers to a linear LSM configuration in which two automatic LSMs are separated by an offline LSM as illustrated in Figure 6. When a cartridge that resides in one of the automatic LSMs needs to be mounted on a drive that is attached to the other automatic LSM, the HSC issues a manual mount message identifying the cartridge VOLSER and the address of the drive on which it is to be mounted.

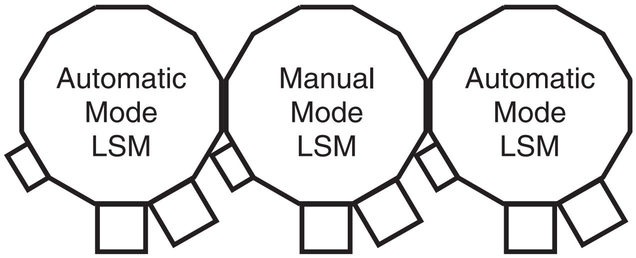


Figure 6. Two Automatic LSMs Separated by an Offline LSM

When the manual mount message is displayed on the console, do the following:

1. Write down the VOLSER and the drive address.
2. Issue the EJect command to eject the cartridge from the first automatic LSM, and remove it from the CAP. For instructions on ejecting cartridges, refer to “Ejecting Cartridges From the LSM” on page 303.
3. Refer to the appropriate StorageTek hardware operator’s guide to see how to remove a cartridge and enter it into another automatic LSM.
4. Issue the Mount command.

Returning the LSM to Automatic Mode

This section describes how to return the LSM to automatic mode. The following topics are discussed:

- making the transports ready
- exiting the LSM
- placing the LSM in automatic mode
- how to handle outstanding requests for manual mounts
- how to handle outstanding dismounts
- entering cartridges that were logically ejected during manual mode.

Note: SL3000 and SL8500 libraries operate in automatic mode and do not support manual mode.

Making the Transports Ready

All the transports must be in a READY condition before you close the LSM access door and place the LSM in automatic mode. Refer to the appropriate StorageTek hardware operator's guide for instructions.

Exiting the LSM

Follow the procedures described in the appropriate StorageTek hardware operator's guide.

Placing the LSM in Automatic Mode

Place the LSM in automatic mode by issuing the following command at the console:

```
MODify LSM lsm-id ONline
```

The HSC issues the message:

```
... LSM AA:LL:CC now ONLINE
```

How to Handle Outstanding Requests for Manual Mounts

There may be outstanding manual mounts if you replied ''I'' to the HSC manual mount message, or made no response to the message and did not mount the cartridge. In both cases, the mounts can be automated after modifying the LSM online.

- If you replied ''I'' to the manual mount message, you can re-drive the mount after the LSM is placed in automatic mode by issuing the HSC Mount command. Refer to "MOUNT Command" on page 184 for details on command syntax and parameters.

- If you have not responded to the manual mount message, the mount is performed automatically after the LSM is placed in automatic mode.

Manual Mounts Requiring Automated Dismounts

Dismount requests for manually mounted volumes may be received before and after the LSM is placed in automatic mode. If manually mounted volumes are deleted from the control data set at mount time, the HSC requires operator assistance to semi-automate the dismounts.

Manual Dismount Requested Before the LSM is Online

You can ignore a manual dismount request and modify the LSM online, leaving the cartridge mounted on the transport. When the LSM is in automatic mode, the dismount can be semi-automated in one of two ways.

- You can initiate the dismount by doing the following:
  1. Issue the HSC command:

     ```
     DISMount ,devaddr
     ```

     Do not specify a VOLSER. Refer to "DISMOUNT Command" on page 60 for details on using the DISMount command.

  2. Reply ''E'' to the HSC message

     ```
     ... Dismount of...; reply I, U,VOLSER, R, or E
     ```

     The cartridge is dismounted and ejected from the LSM.

- You can wait for the next mount request for the transport containing the volume to be dismounted. When the robot discovers the volume mounted in the transport, the HSC issues the message:

  ```
  ... Dismount of...; reply I, U,VOLSER, R, or E
  ```

  Reply ''E'' to dismount the volume and eject it from the LSM.

Dismount Requested After the LSM is Online

Dismounts requested after the LSM is online cause the HSC to issue the message:

```
... Dismount of...; reply I, U,VOLSER, R, or E
```

Reply ''E'' to dismount the volume and eject it from the LSM.

Entering Cartridges That Were Logically Ejected During Manual Mode

After modifying the LSM online, the cartridges that were removed from the LSM during manual mode operations can be reentered through the CAP, as described in "Entering Cartridges Into an LSM" on page 303.

Note: Refer to "Entering Duplicate and Unreadable Volsers" on page 351 for instructions on entering duplicate cartridges.

LMU Operation

The LMU responds to mount and dismount requests from the host through the HSC and passes each request to the appropriate LSM, which performs the physical action requested. The following procedures are described in this section:

- displaying LMU status
- operating an LMU - dual LMU configuration.

Notes:

- When you IPL an LMU, error messages appearing before the message:

  ... ACS *AA* LSM *LL* ready; ...

  can be ignored. Do not ignore error messages that are displayed after the message.

- Refer to the appropriate StorageTek hardware operator's guide for a description of the LMU control panel and information on how to power on/off and IPL an LMU in both stand-alone LMU and dual LMU configurations.

Displaying LMU Status

To determine the status of the LMU, issue the following command:

```
Display Acs acs-id
```

The command response lists the following:

- current status of the ACS
- current status of the dual LMU (if configured) including:
  - master LMU
  - standby LMU
- online, offline or standby status of each dual LMU station
- HSC/LMU compatibility levels.

Note: Refer to "Display Acs" on page 65 for details on command syntax and parameters.

Operating an LMU - Dual LMU Configuration

Dual LMU Operational Overview

Dual LMU configurations provide a backup LMU which can take over if the active (master) LMU fails. (Refer to “Dual LMU” on page 5 for a description of the dual LMU option.) Both LMUs are capable of being the master but only one can be the master at a given moment. Each LMU regularly checks the status of the other LMU over the LAN. The HSC directs all I/O to the master LMU.

When an LMU is powered on in a dual LMU environment, it places itself in a standby status and then checks for an active master LMU. If an active master LMU exists, the second LMU remains available as the standby LMU. If an active master LMU does not exist, the first LMU to be fully initialized becomes the master LMU.

If both LMUs power on successfully, the following HSC message is displayed:

```
... ACS AA: Dual LMU is configured; Master is y, Standby is ready
```

where *y* is the configured LMU identifier; ‘‘A’’ or ‘‘B.’’

Note: If a series of highlighted messages is displayed, alternately indicating first one LMU then the other is master, refer to “Dual LMU Recovery” on page 358 for recovery procedures.

LMU Switch Overview

The master LMU functionality can be switched in the following ways:

- an automatic switch due to a self-detected failure or power supply problem in the master LMU
- an operator initiated switch (using the SWitch command) after all online stations become incapable of communication
- an operator initiated switch (using the SWitch command) while online stations remain capable of communication with the master LMU
- the IPL switch on the master LMU is pressed.
- the master LMU is powered off.

Consequences of an LMU Switch

When an LMU switch occurs, a series of console messages track the changing status of the master and standby LMUs. Critical status changes appear as highlighted messages which remain on the screen until the condition is corrected or the message is superseded.

The following message is displayed when status changes and the standby LMU is ready:

```
... ACS AA: Dual LMU is configured; Master is y, Standby is ready
```

The following message is displayed if there is a status change and an LMU error occurs:

```
... ACS AA: Dual LMU Is Not configured; Master Is y, Standby is not ready
```

The following message is displayed if there is a status change and the standby LMU is not ready:

```
... ACS AA: Dual LMU Is configured; Master Is y, Standby is not ready
```

In the messages above, *y* is the configured LMU identifier, ‘‘A’’ or ‘‘B.’’

Note: If a series of highlighted messages is displayed, alternately indicating first one LMU, then the other is master, refer to “Dual LMU Recovery” on page 358 for recovery procedures.

When an LMU switch occurs, the HSC interrogates the LMUs to determine the current status of each station. The status of each station is maintained as online, offline, standby, pending online, pending offline, or pending force offline. Use the Display Acs command to determine the status of each station, as well as the status of each LMU. Refer to “Display Acs” on page 65 for details on command syntax and parameters.

Note: Auto-mode CAPs are locked during an LMU switch until the LSM completes initialization.

Automatic LMU Switch

LMU µ-software detects, reports, and reacts to LMU failures as necessary to keep the ACS operational. You have no control over the timing of an automatic LMU switch; therefore, some work may be in process within the LMU. When the standby LMU takes over as master, it notifies the HSC of its status and sends the LMU Ready signal. The HSC reads the recovery information provided by the new master LMU concerning in transit cartridges within the various LSMs in the ACS.

The HSC then:

- modifies, or marks ‘‘completed,’’ the queued requests, reflecting the current locations of in-transit cartridges
- sends all incomplete requests to the new master LMU
- marks cartridges as errant when requests cannot be completed successfully.

Note: Enter and eject operations may have to be restarted after an LMU switch.

Operator Initiated LMU Switch

Before you initiate an LMU switch while some stations are communicating, determine if the need to switch LMUs is immediate, or if processing can be completed prior to making the switch. If the need to switch LMUs is not critical, wait until the LSMs are relatively idle.

Initiate an LMU switch by issuing the following command:

```
SWitch Acs acs-id
```

Refer to "SWITCH Command" on page 216 for details on command syntax and parameters.

The command is routed through the standby LMU to the disconnected master LMU, causing it to IPL. The following sequence of events occurs:

1. The HSC issues the message

```
... ACS AA: Switch initiated, expect notification in 20 seconds
```

2. The standby LMU becomes the master LMU (''MASTER'' indicator illuminates).
3. Online LSMs perform quick-init.
4. As each LSM becomes ready, the HSC issues the message

```
... ACS AA LSM LL Ready; Temp Outage Queue Will Be Re-Driven
```

5. If the old master LMU completes IPL successfully, it becomes the standby LMU.

If the SWitch command is issued while processing is active, cartridges may be in-transit in various LSMs. Recovery procedures occur automatically as described in "Automatic LMU Switch" on page 327. Upon receiving the LMU Ready signal, the HSC waits for the LSMs to complete a quick-init and then re-drives the requests building up on the Temp Outage Queue.

SL8500 LC Operation

The Library Controller (LC) responds to mount and dismount requests from the host through the HSC and passes each request to the appropriate LSM, to perform the physical action requested.

The following procedures are described in this section:

- “Displaying ACS Status” on page 329
- “Operating an LC - Redundant LC Configuration” on page 330

Notes:

- When you reboot an LC, error messages appearing before the message:

  ```
  ... ACS AA LSM LL ready; ...
  ```

  can be ignored. Do not ignore error messages that are displayed after the message.

- Refer to the appropriate StorageTek hardware operator's guide for a description of the library control panel and information on how to power on/off and boot a Library Controller in both stand-alone LC and redundant LC configurations.

Displaying ACS Status

To determine the status of the LC, issue the following command:

```
Display Acs acsid
```

The command response lists the following:

- Current status of the ACS
- Current status of the Redundant LC (if configured) including:
  - HSC/LC compatibility levels
  - Active LCs
  - Standby LCs
  - Online, offline or standby status of each LC

Operating an LC - Redundant LC Configuration

Redundant LC Operational Overview

Redundant Electronics configurations provide a backup LC which can take over if the active LC fails. (Refer to "Dual Library Controller Configuration" on page 6 for a description of the dual LC option.) Both LCs are capable of being the active but only one can be the active at any given moment. Each LC regularly checks the status of the other LC over the LAN. HSC directs all I/O to the active LC.

When an LC is powered on in a dual LC configuration, it places itself in a standby status and checks for an active LC. If an active LC exists, the second L C remains ready as the standby. If an active LC does not exist, the first LC to be fully initialized assumes the active role.

If both LCs power on successfully, the following HSC message is displayed:

```
... ACS AA: RE LIBID C1 is configured; Active is y, Standby is ready
```

where *y* is the configured LC identifier; "A" or "B."

LC Switch Overview

The active LC functionality can be switched in the following ways:

- An automatic switch from a self-detected failure or power supply problem in the active LC.
- An operator initiated switch (using the SWitch command) after all online stations become incapable of communication.
- An operator initiated switch (using the SWitch command) while online stations remain capable of communication with the active LC.
- When the reboot switch on the active LC is pressed.
- When the active LC is powered off.

Consequences of an LC Switch

When a LC switch occurs, a series of console messages track the changing status of the active and standby LCs. Critical status changes appear as highlighted messages which remain on the screen until the condition is corrected or the message is superseded.

The following message is displayed when status changes and the standby LC is ready:

```
... ACS AA: RE LIBID C1 is configured; Active is y, Standby is ready
```

The following message is displayed if there is a status change and a LC error occurs:

```
... ACS AA: RE LIBID C1 Is Not configured; Active Is y, Standby is not
    ready
```

The following message is displayed if there is a status change and the standby LC is not ready:

```
... ACS AA: RE LIBID C1 Is configured; Active Is y, Standby is not ready
```

In the messages above, *y* is the configured LC identifier, “A” or “B.”

When a LC switch occurs, the HSC interrogates each LC to determine the current status. The status of each station is maintained as online, offline, standby, pending online, pending offline, or pending force offline. Use the Display Acs *acsid* command (see page 66) to determine the status of each station and LC.

Note: Auto-mode CAPs are locked during a LC switch until the LSM completes initialization.

Automatic LC Switch

LC microcode detects, reports, and reacts to LC failures as necessary to keep the ACS operational. **This happens automatically so some work may be in process within the LC.** When the standby LC assumes the active role, it notifies the HSC of its changed status and sends the LC Ready signal. HSC reads the recovery information provided by the new active LC concerning in transit cartridges within the various LSMs in the ACS. The HSC then:

- modifies, or marks "completed," the queued requests, reflecting the current locations of in-transit cartridges.
- sends all incomplete requests to the active LC.
- marks cartridges as errant when requests cannot be completed successfully.

Note: Enter and eject operations may have to be restarted after a LC switch.

Operator Initiated LC Switch

Before initiating a LC switch if some network connections are communicating, determine if the need to switch LCs is immediate, or if processing can be completed prior to initiating the switch. If the need to switch LCs is not critical, wait until the LSMs are relatively idle.

Initiate an LC switch for a Library ID by issuing the following command:

```
SWitch Acs acsid LIB libid
```

The command is routed through the standby LC to the disconnected LC, causing it to reboot. The following sequence of events occurs:

1. HSC issues the message

   ```
   ... ACS AA: Switch initiated, expect notification in 20 seconds
   ```

2. The standby LC assumes the active LC role (“ACTIVE” indicator illuminates).
3. Online LSMs perform quick-init.
4. As each LSM becomes ready, the HSC issues the message:

```
... ACS AA LSM LL Ready; Temp Outage Queue Will Be ReDriven
```

5. If the former active LC completes reboot successfully, it assumes the standby LC role.

If the SWitch command is issued while processing is active, cartridges may be in-transit in various LSMs. Recovery procedures occur automatically as described in “Automatic LC Switch” on page 332. Upon receiving the LC Ready signal, HSC waits for the LSMs to complete a quick-init and then re-drives the requests through processing the Temp Outage Queue.

CAP Manual Recovery

When the LC Switch occurs and certain CAP functions are processing requests (enter/eject), manual intervention for recovery is required after the switch has completed. Below are various CAP scenarios with an appropriate procedure to resolve for each.

A Switch Occurs When an Enter Function is Active

When a switch occurs and an enter function is active, after the switch completes, two possible events can occur simultaneously or individually:

- A cartridge is selected by HSC/ELS, but not moved to an LSM home cell when the switch occurred. After the switch completes, the cartridge is selected and cannot be moved to an LSM cell.
- The cartridges in the CAP to be moved to the LSM receives message SLS0699I - 03/01 error from the library during a move. The library reserves the CAP because there are carts in the CAP after the switch completes. The library retains ownership of the CAP until the cartridges are removed. This is normal behavior of the SL8500 library.

Procedure to resolve:

- Use the procedure in the *SL8500 Operator's Guide* to manually remove the cartridges from the CAP with the SLC.
- Issue a Display Cap *aa*:*ll*:*cc* command for the specific cap affected.
- If the CAP is offline, issue the Modify CAP *aa*:*ll*:*cc*,online command.
- Issue the ENter *aa*:*ll*:*cc* command to restart the enter function for the CAP
- If CAP is automatic, issue:

  ```
  CAPP x aa:ll:cc MANual
  CAPP x aa:ll:cc AUTO
  ```

  to reset it to auto mode.
- Insert the balance of the cartridges removed from the previous Enter into the CAP.
- If an SLS0251E message that states that volser is a duplicate, run the Unselect utility (refer to the *HSC System Programmer's Guide*) to unselect the volser. Afterwards, the volser may be entered into the LSM.

  When you enter the volser, message SLS0694D is displayed to ask you what you want to do with the duplicate, you should respond "logically delete."

A Switch Occurs When an Eject Function is Active

When a switch occurs and an eject function is active, after the switch completes, the cartridges in the LSM to be moved to the CAP receive an SLS0699I message - 03/01 error from the library for the move operation. The library reserves the CAP because there are carts in the CAP after the switch completes. The library retains ownership of the CAP until the cartridges are removed. This is normal behavior of the SL8500 library.

Procedure to resolve:

- Use the procedure in the *SL8500 Operator's Guide* to manually remove the cartridges from the CAP with the SLC.
- Issue a Display Cap *aa*:*ll*:*cc* command for the specific cap affected
- If the CAP is offline, issue the Modify CAP,online command
- Re-issue the EJECT *vol-list* or *vol-range aa*:*ll*:*cc* command or restart the EJECt utility to eject the balance of the cartridges.
- If the CAP was automatic prior to the eject function, issue the CAPP *x aa*:*ll*:*cc* manual and then re-issue is as CAPP *x aa*:*ll*:*cc* auto to reset it to automode.

A Switch Occurs When CAPs are Set to Automatic Mode

When a switch occurs and CAPs are set to automatic mode, when the switch completes, message SLS0699I may be presented with a return/reason code of 07/05 error from the library during a reserve of the CAP. This is because the CAPs have not initialized completely after the switch has completed. This is normal behavior of the SL8500 library.

Procedure to resolve:

- Wait until the message SLS0668I for the last LSM in the library switched is issued.
- Issue a CAPPref *prefvalue aa*:*ll*:*cc* MANual for each automatic CAP.

  Issue a CAPPref *prefvalue aa*:*ll*:*cc* AUTO for each CAP to become automatic.

Chapter 4. Managing Library Resources

Overview

This chapter describes techniques and procedures for managing library resources. Effective resource management can improve overall library performance, eliminate labor-intensive processes, reduce the potential for human errors, and help integrate library resources with nonlibrary resources.

The following topics are discussed:

- mount processing with library and nonlibrary resources
- controlling pass-thru operations after dismount
- moving cartridges within the library
- monitoring move requests from the tape management system interface
- working with scratch volumes and subpooling.

Note: Refer to the documentation for your tape management system. Those procedures supersede the procedures in this chapter.

Mount Processing with Library and Nonlibrary Resources

If the library is located in a data center that also uses nonlibrary transports and nonlibrary cartridges, the following situations can occur:

- mount request for a library cartridge on a nonlibrary transport
- mount request for a nonlibrary cartridge on a library transport.

The following sections discuss the processing options available to you and the procedures that are required.

Mount Request for a Library Cartridge on a Nonlibrary Transport

Requesting HSC Assistance

The HSC does not become involved in a mount request for a library cartridge on a nonlibrary transport. The following procedure describes the operator action required for these requests:

1. Confirm that the cartridge is in the library by issuing the command

   ```
   DISPLAY VOLSER volser
   ```

   where:

   volser
   is the VOLSER of the cartridge.

   Note: Refer to “Display Acs” on page 65 for details on command syntax and parameters.

2. If the cartridge is in an LSM, issue the command

   ```
   EJECT volser cap-id
   ```

   where:

   cap-id
   is the CAP for the LSM containing the cartridge.

   Note: Refer to “EJECT Command” on page 142 for details on command syntax and parameters.

3. Retrieve the ejected cartridge and mount it on the appropriate nonlibrary transport.

4. Reenter the cartridge after dismount.

   Refer to “Entering Cartridges Into an LSM” on page 303 for more information.

Not Using HSC Assistance

When MNTD VOLWatch(OFf) is set (the normal HSC setting), the HSC does not become involved in a mount request for a library cartridge on a nonlibrary transport. The following procedure describes the operator action required for these requests:

1. Confirm that the cartridge is in the library by issuing the command

   ```
   DISPLAY VOLSER volser
   ```

   where:

   volser
   is the VOLSER of the cartridge.

   Note: Refer to “Display Acs” on page 65 for details on command syntax and parameters.

2. If the cartridge is in an LSM, issue the command

   ```
   EJECT volser cap-id
   ```

   where:

   cap-id
   is the CAP for the LSM containing the cartridge.

   Note: Refer to “EJECT Command” on page 142 for details on command syntax and parameters.

3. Retrieve the ejected cartridge and mount it on the appropriate nonlibrary transport.
4. Reenter the cartridge after dismount.

Mount Request for Nonlibrary Cartridge on Library Transport

When a mount request for a nonlibrary cartridge on a library transport is received, the HSC issues the message:

```
 ... Mount of volser on drive XXX - Volume not in library; reply “I”, “R”,
“T,capid” or “P,capid”
```

You have the following choices:

- Respond ‘‘I’’ (to ignore the mount), and select the appropriate response from the following:
  - If using VMTAPE, the mount request is cancelled.
  - If using another tape management system, the mount may be cancelled.
  - Cancel the job.
  - Enter the cartridge and use the HSC Mount command to redrive the mount request.
- Respond ‘‘P’’ to proceed with the mount and permanently store the cartridge in the library when it is dismounted. You have the option to specify a CAPid.
- Respond ‘‘T’’ to proceed with the mount and have the cartridge ejected automatically when it is dismounted. You have the option to specify a CAPid.
- Do not respond to the message but enter the cartridge using the HSC ENter command. The HSC recognizes the cartridge and mounts it on the appropriate transport.

Notes:

- If you respond either ‘‘P’’ or ‘‘T,’’ the HSC issues the message

  ```
  ... Open CAPid AA:LL:CC for entering when unlocked to inform you when
  to enter the cartridge.
  ```

- Refer to “ENTER Command” on page 159 for details on command syntax and parameters.
- Refer to “Entering Cartridges Into an LSM” on page 303 for the procedure to enter cartridges.

Controlling Pass-Thru Operations After Dismount

In a multiple-LSM configuration, a mount request can require one or more pass-thru operations if the specified cartridge and transport are in different LSMs. When the cartridge is dismounted, the HSC normally attempts to assign the cartridge a new cell location in the LSM where the dismount occurs. A pass-thru operation is performed after dismount only when there are no available cells in the LSM. This feature is called ‘‘floating.’’

If you want the dismounted cartridge to be returned to its original home cell location, you can disable floating by issuing the following command:

```
MNTD FLOAT(OFF)
```

☞ **Note:**

- Refer to “MNTD (Mount/Dismount Options) Command and Control Statement” on page 165 for details on command syntax and parameters.
- The command must be issued once for each host where you want floating disabled. This can be accomplished by one or more entries in the startup parameters (PARMLIB control statements). Refer to “HSC Control Statements and HSC Start Procedure” in the *HSC System Programmer’s Guide* for more information.

Moving Cartridges Within The Library

It may be necessary to move cartridges within a single LSM, or between two or more LSMs to accommodate hardware changes (for example, adding transports to an LSM) or to better control tape activity. Cartridge movement can be done manually by data center personnel, or it can be automated by LSM robots.

Moving Cartridges Manually

Moving cartridges manually involves the following actions:

- modifying one or more LSMs offline. Automatic processes are stopped and mount/dismount functions must be performed manually by the operator.
- locating the cartridges to be moved, and removing them from their cell locations.
- moving the cartridges to the new cell locations.
- modifying the LSMs online.
- running the AUDIt utility on both the old cell locations and the new cell locations.

This procedure is time-consuming, prone to human errors, and interrupts automatic operations.

Automating Cartridge Movement

Moving cartridges can be automated by LSM robots using either the HSC MOVe command or MOVe utility. Both the command and the utility allow you to identify the cartridges to be moved either by location (LSM, panel, row, and column), or by VOLSERs. The following conditions apply:

- The MOVe command allows you to specify up to 100 cartridges in one command, while the MOVe utility does not limit the number of cartridges you can specify.
- Both the command and the utility display cartridge movement activity on the console, but the MOVe utility also provides an output report.
- Moving cartridges to new cell locations in the same panel is prohibited.
- Cartridges can be moved **from only one LSM at a time**; although they can be moved to another panel within the same LSM, or to one or more different LSMs in the same ACS.
- Cartridge movement to a list of LSMs is done on a first-come first-serve basis. The specified cell locations in the first LSM in the list are filled, then the cells in the second LSM listed, then the cells in the third LSM, and so forth, until either all specified cartridges are moved, or all specified cell locations are full.

The procedure for automating cartridge movement is as follows:

1. Identify the cartridges to be moved (by VOLSERs or cell locations) using one of the following:
    - the HSC VIew command
    - a volume report
    - an audit report
    - hardware configuration records
    - a visual inspection inside the LSM.
2. Identify the destination cell locations by:
    - issuing the VIew command
    - performing a visual inspection inside the destination LSMs.
3. Issue the MOVe command or run the MOVe utility.
4. If hardware changes have been made, run the AUDIt utility on all changed panels.

Notes:

- Refer to “VIEW Command” on page 229 for details on command syntax and parameters.
- Refer to “MOVE Command” on page 189 for details on command syntax and parameters.
- Refer to “Utility Functions” in the *HSC System Programmer’s Guide* for explanations of library utilities.

Working with Scratch Volumes and Subpooling

Maintaining scratch lists and establishing scratch subpools are functions of a tape management system. The HSC manages library-controlled scratch cartridges, maintains its own scratch list, and supports scratch subpooling. Operator commands, control statements, and utilities allow you to control library scratch resources.

The following lists provide a summary of HSC scratch functions, and point you to detailed information on specific topics:

- Operator commands
  - Display SCRatch - displays scratch count information based on subpools. (Refer to "Display Acs" on page 65)
  - Display THReshld - displays threshold values set by the Warn command. (Refer to "Display THReshld" on page 121)
  - EJect - ejects up to 9999 scratch cartridges from a given subpool. (Refer to "EJECT Command" on page 142)
  - ENter - enters one or more volumes and places them in scratch status. (Refer to "ENTER Command" on page 159)
  - MNTD Scratch - determines how a scratch volume is selected to satisfy a scratch mount request for a manual mode LSM. (Refer to "MNTD (Mount/Dismount Options) Command and Control Statement" on page 165)
  - MNTD SCRDISM - specifies whether a scratch volume that is mounted in a WolfCreek LSM is to be moved to another LSM when it is dismounted. (Refer to "MNTD (Mount/Dismount Options) Command and Control Statement" on page 165)
  - Mount SCRTCH or PRIVAT - mounts a scratch volume. (Refer to "MOUNT Command" on page 184)
  - Warn - establishes scratch warning threshold values. (Refer to "WARN Command" on page 238).
  - PARMLIB control statements
  - SCRPOol - defines scratch subpool names, VOLSERs, and label types.

  Note: Refer to "HSC Control Statements and HSC Start Procedure" in the *HSC System Programmer's Guide* for explanation of PARMLIB control statements.

- Utilities
  - EJECt - ejects scratch cartridges in batch mode using one or more CAPs.
  - ENTEr - enters any number of cartridges and places them in scratch status.
  - Scratch Redistribution - balances the number of scratch volumes between specified LSMs in an ACS. Provides an option to balance by subpool.
  - Scratch Update - directly updates the HSC scratch list.

- Volume Report - provides report information on scratch volumes and scratch subpools.

Note: Refer to "Utility Functions" in the *HSC System Programmer's Guide* for explanations of library utilities.

Chapter 5. Problem Resolution and Recovery Procedures

Overview

This chapter provides procedures for responding to problems involving library hardware, library software, and cartridges. Both the library hardware and the HSC have built-in recovery mechanisms which are capable of responding to most problem situations. In many cases, operator procedures involve determining what happened and verifying that automated recovery completed successfully.

The next section, “Problem Solving Strategy” on page 348, identifies the resources available for problem identification, to help you restore automated operations as quickly as possible. The remainder of the chapter discusses the following topics:

- recovering errant cartridges
- entering duplicate and unreadable VOLSERs
- how to clear RECOVERY status on a CAP
- freeing an allocated CAP
- recovering locked enhanced CAP with missing magazine
- restoring host-to-host communications services
- special conditions
- LMU switch recovery.

Problem Solving Strategy

The basic problem solving strategy for the library subsystem can be expressed in the following steps:

1. Determine the nature of the problem using:
   - HSC messages
   - system messages
   - HSC display commands
2. Determine
   - volume involved
   - type of request
   - failing component
   - alternative methods available.
3. Weigh alternatives to minimize impact on production.
4. Notify all concerned parties of the action being taken.
5. Execute solution.

The following library-specific resources are available to help you determine the nature of a problem:

- ACS and HSC documentation
  - *Messages and Codes Guide*
  - *System Programmer's Guide*
  - *Operator's Guide*
  - *Hardware Operator's Guides*
  - Locally developed procedures.
- HSC commands
  - Display
  - VIew.
- HSC utility reports
  - Audit report
  - Volume report.
- Stand-alone POST locate utility.

Notes:

- Refer to Chapter 2, "Commands, Control Statements, and Utilities" on page 15 for details on HSC operator commands.
- Refer to the *HSC System Programmer's Guide* for details on library utilities.

Recovering Errant Cartridges

A cartridge becomes errant when the HSC is uncertain of the location of the volume in the LSM. The following conditions **may** cause a cartridge to become errant.

- An operator modifies an LSM offline using the FORCE option.
- The volume is not located in the cell location specified by the control data set.
- An unrecoverable error occurs in the LMU.
- An unrecoverable error occurs in the LSM.

Errant volume recovery is performed automatically any time the HSC attempts to use a cartridge that is marked as errant,

- any time the HSC attempts to use a cartridge that is marked as errant
- when an ACS is connected,
- when an LSM is modified online, or
- when cross host recovery is performed.

The operator is notified by the following HSC message:

```
... Attempting to locate errant volume VVVVVV
```

If the cartridge is located by checking its original source location or its destination location, the HSC removes it from errant status.

If the cartridge cannot be located, the operator is prompted by the following message:

```
... Volume VVVVVV not found; Eject or Ignore (E|I)?
```

Respond with one of the following:

- Reply ‘‘E’’ **if you are certain that the cartridge is not in the library**. The cartridge is deleted (logically ejected) from the control data set.

- Reply ‘‘I’’ if you do not know the location of the cartridge, to leave the cartridge in errant status. An audit trail is maintained for the cartridge, which can be helpful if it becomes necessary to manually locate the cartridge.

  If the cartridge is located at a later time, the HSC recognizes it as errant and removes it from errant status. The cartridge is either returned to its home cell location, or marked selected for a request.

Using the VIew Command to Locate an Errant Cartridge

Errant recovery may not be able to locate an errant cartridge because it is loaded on a transport. When this occurs, the HSC issues the message:

```
... Errant recovery of VVVVVV - drive XXX is
    loaded; reply Retry or Ignore (R/I)
```

Use the following procedure to determine the VOLSER of the loaded cartridge:

1. Issue the VIew command to inspect the transport addressed in the message (refer to "VIEW Command" on page 229).

Note: The VIew command is not supported by the SL3000 and SL8500 libraries.

2. If the VOLSER of the loaded cartridge matches the errant VOLSER, and the transport is not in use (allocated), unload the cartridge from the transport.
3. Reply "R" to the message. The cartridge is removed from errant status and made available for the next request.

Entering Duplicate and Unreadable Volsers

Entering Duplicate Volumes

When you try to enter a VOLSER that is already recorded in the control data set, the HSC attempts to locate the original cartridge by checking its home cell location or destination location. If the volume is found, the duplicate cartridge is rejected by the HSC.

If the volume is not found, the HSC response is determined by the OPTion ENTdup command setting.

- If OPTion ENTdup is set to Auto, the HSC automatically deletes the original volume from the control data set, and enters the new volume.
- If OPTion ENTdup is set to Manual, the HSC requests operator assistance by issuing the following message:

```
 ... ENTER of volume VVVVVV encountered missing duplicate volser;
(Logically) Delete, or Ignore (D,I)?
```

  Reply ‘‘D’’ to delete the original volume from the control data set and enter the new volume.

Note: Refer to “OPTION Command and Control Statement” on page 197 for details on command syntax and parameters.

Entering Cartridges With Missing or Unreadable Labels

If you attempt to enter a cartridge without a label, or with a label the robot cannot read, the following HSC message is issued:

```
... UnNamed Cartridge in CAP CELL AA:LL:RR:CC;
    reply ‘‘V,volser’’ or ‘‘EJECT’’
```

Do one of the following:

- Reply ‘‘V,volser’’ to enter the cartridge by assigning it a VOLSER. The specified VOLSER is permanently assigned to the cartridge in the control data set.

  Note: If any unlabeled cartridges or cartridges with unreadable labels are manually entered into a library, they will be ejected during an audit. StorageTek recommends that users provide an external media label for all cartridges. **SL3000 and SL8500 libraries will not enter a non-labeled cartridge.**

- Reply ‘‘EJECT’’ and remove the cartridge from the CAP when the CAP is unlocked.

How to Clear Recovery Status on a CAP

When you issue the Display Cap command and the status for a CAP is indicated as RECOVERY, use the following procedure to force CAP recovery.

Note: If this procedure does not clear recovery status, try "Freeing an Allocated CAP" on page 353.

1. Issue the following command:

```
ENTER cap-id
```

   where:

   cap-id
   is the CAP you want to recover.

The following occurs:

   a. The LSM robot moves to the CAP and performs a CAP catalog.

   b. If cartridges are detected in the CAP, the HSC issues a message instructing the operator to remove the cartridges.

   c. The HSC issues the message:

```
... Open CAPid AA:LL:CC for entering when unlocked
```

   d. The CAP ENTER indicator illuminates or Enter appears on the display panel.

2. Issue the DRAin command against that CAP.

   The CAP is locked and the status is set to INACTIVE.

Freeing an Allocated CAP

Caution: Use this procedure only if the CAP is not in use. Releasing a CAP from an active command or utility may produce unpredictable results. Examples of these are:

- CAP cleanup
- errant cartridges
- cartridges still in the CAP that are unknown to the HSC.

If a host terminates without performing recovery while an active process is using a CAP, the CAP remains allocated to the host and is unavailable to all other hosts. If the HSC is brought back up on that host, it releases the CAP after initialization. Otherwise, you can free the CAP by issuing the following command from any connected host:

```
RELEASE cap-id
```

where:

cap-id
specifies the CAP you wish to release.

Note: Refer to "RELease CAP Command" on page 206 for details on command syntax and parameters. The HSC issues a message prompting you to confirm that the CAP is to be released.

- Reply "N" to cancel the release.
- To proceed with the release:
  1. Verify that the CAP is not in use by visually inspecting the CAP, issuing the Display Cap command on other hosts, and checking with other personnel.
  2. Reply "Y" to the message.

  Another message confirms the CAP is released.

Recovering a CAP with Missing Magazine

An error condition occurs when you close a magazine-style CAP without the bottom magazine in place, or with a missing magazine between other magazines. What happens is determined by the CAP hardware.

Note: SL3000 and SL8500 CAPs can accommodate missing magazines.

Missing Magazines in an Enhanced CAP

If the bottom magazine is not in place or a magazine is missing between other magazines when you close an enhanced CAP, the display indicates an error condition and the CAP does not lock.

When this occurs, open the CAP and replace the missing magazines.

Missing Magazines in a WolfCreek CAP

If the bottom magazine is not in place when you close a WolfCreek 20-cell CAP or the optional 30-cell CAP, the HSC issues the message:

```
... CAP AA:LL:CC unlocked; Magazine(s) installed improperly
```

and the CAP unlocks. EJECT or ENTER is displayed indicating that the CAP can be opened, and the rectangle indicator for the bottom magazine does not appear in the display.

Caution: The robot cannot detect when the middle magazine is not in place in the WolfCreek optional CAP. If only the top and bottom magazines are in place when the CAP is closed, the robot enters the cartridges in the bottom magazine, but the cartridges in the top magazine are not entered.

The WolfCreek CAPs require only the bottom magazine to be in place when the CAP is closed. For the WolfCreek optional CAP, the operator is responsible for making sure that the CAP is not closed when the middle magazine is not in place and cartridges are in the top magazine. These cartridges are not entered by the robot.

Restoring Host-to-Host Communications Services

The COMMPath command and control statement enables the user to define a tiered communications service between HSC hosts. With this type of service in place, the HSC automatically performs a path switch if a host receives an error trying to send a message over the current communications path. Depending on the paths defined, an automatic switch can be to an equivalent path type (from one LMU path to another), or to a lower performance method (for example, from VTAM to LMU).

The HSC notifies you when a switch occurs by issuing the following message to the console on both hosts:

```
... A communications path switched from XXXX1 to XXXX2; ...
```

where:

XXXX1
specifies the previous communications path.

XXXX2
specifies the current communications path.

The message also identifies the host that either initiated the switch or experienced the failure.

After the HSC performs a downward switch, an upward switch can only be accomplished using the COMMPath command.

Note: Refer to “Communications Path (COMMPath) Command and Control Statement” on page 53 for details on command syntax and parameters.

The following procedure describes how to initiate an upward switch:

- Find and correct the problem which prompted the switch.
- Return to the previous communications method by issuing the command

```
COMMPATH HOSTID(host-id) METHOD(method)
```

where:

host-id
specifies the host which the command affects.

method
specifies the method you want to be made current. 5

Special Conditions

This section describes certain situations that can occur during automated operations. The following situations are addressed:

- resolving possible lost mount requests
- multiple mounts for the same volume
- resolving lost responses.

Resolving Possible Lost Mount Requests

A mount request may be lost when an LMU error occurs. If you suspect lost mounts:

1. Ask the tape management system to display information about pending mounts.
2. Enter an HSC Mount command specifying any volume in the library and the transport with the mount pending. The TMS issues a dismount because the wrong volume is mounted. A subsequent mount is issued for the correct volume, causing the LSM to dismount the incorrect volume and mount the correct one.

Multiple Mounts for the Same Volume

The HSC issues the following message when it receives a request to mount a volume that is not yet dismounted:

```
... Mount of VVVVVV on drive XXX -
    Waiting for volume; reply ''I'' to cancel wait
```

Do not reply, which causes the mount to wait. The robot dismounts the volume when it is unloaded and performs the subsequent mount.

Resolving Lost Responses

Occasionally a mount request gets stuck on one of the HSC queues due to a response not being received from the LMU. When this happens the volume is left in a selected status and the operator is notified by the Overdue Response Handler (ORH).

Overdue Response Handler

Every 30 seconds, the ORH scans all queues for each ACS to identify requests with sequence numbers whose response wait time intervals have expired. When a time interval expires, the HSC issues the message

```
... ORH interval expired: ...
```

and the ORH checks the request type code. For all request type codes other than mount, dismount, and move, the ORH automatically extends the request's wait time another increment of 3, 5, 10, or 60 minutes, and issues the message:

```
... ORH interval extended: ...
```

Operator Response Required For Mount, Dismount, and Move

For mount, dismount, and move requests, the operator is prompted by the message: ...

```
ORH: ABORT/EXTEND/REDRIVE? ...
```

Respond with one of the following:

- ABORT — the task that requested the operation is notified that the request has been abnormally terminated by ORH. This removes the volume from selected status and allows the operator to issue HSC Mount or DISMount commands as necessary to keep the work moving.
- EXTEND — the ORH adds another ten minute increment to the request and leaves it on the same queue that it is currently on. There is no limit to the number of extensions an operator may request.
- REDRIVE — If the request is on the Temp Outage Queue, then the request is moved to the Waiting Request Queue and the ORH posts an available station driver to look for work.

If the request is not on the Temp Outage Queue, the following messages are issued:

```
...ORH request not on queue: ...
```

followed by

```
... ORH: ABORT/EXTEND/REDRIVE? ...
```

Note: If a request is redriven from the Temp Outage Queue and immediately turns up on the Temp Outage Queue again, then the station (path), LMU, or required LSM is not ready. An 0125 error may occur if the LMU is still working on a request that is being redriven.

Dual LMU Recovery

When a dual LMU is powered on, or when an LMU switch occurs, the HSC must be able to determine which LMU is the master. A series of messages appear on the operator console when both LMUs respond as master LMUs, or when both respond as standby LMUs, indicating that something is wrong. The following sections describe how to identify and recover from these situations.

When Both LMUs Respond as Master

Messages occurring in the following sequence:

```
... Master Is A, Standby is not ready

... Master Is B, Standby is not ready

... Master Is A, Standby is not ready

... Master Is B, Standby is not ready

.
.
.
```

indicate that both LMUs are responding as master LMUs. The messages remain outstanding until the condition is corrected.

In this situation, you must power off one of the LMUs and issue the command:

```
VARY dev-list OFFLINE FORCE
```

where:

dev-list
is a list of all stations to one of the LMUs.

This allows the remaining LMU to become the master. Restore power to the LMU that you powered off, and vary the stations online.

When Both LMUs Respond as Standby

Messages occurring in the following sequence:

```
... Master Is A, Standby is ready
... Master Is B, Standby is ready
... Master Is A, Standby is ready
... Master Is B, Standby is ready
.
.
.
```

indicate that both LMUs are responding as standby LMUs. The messages remain outstanding until the condition is corrected.

In this situation, you must IPL one or both of the LMUs since the HSC only sends work requests to the master LMU.

Chapter 6. Maintaining an Automated Cartridge System

Overview

StorageTek provides full support for the Automated Cartridge System hardware and software components. On-site maintenance is performed by trained Customer Services Engineers (CSEs) and Systems Support Representatives (SSRs). Remote support facilities, available by telephone, provide direct-from-the-device hardware diagnostics and access to technical specialists who can analyze problems and answer questions.

The following remote support facilities are available:

- A Central Support Remote Center (CSRC), which responds to customer and CSE calls 24 hours a day, 7 days a week.
- Software Support, which responds to customer calls 24 hours a day, 7 days a week
- ServiceTek
- Customer Initiated Maintenance (CIM).

The *Requesting Help from Software Support* guide provides instructions for using StorageTek's remote support facilities.

This chapter describes automated and manual procedures for cleaning library transport tape paths. Refer to the appropriate StorageTek hardware operator's guide for information on maintaining library hardware, and storing, handling, and maintaining cartridges.

Transport Tape Path Cleaning

When a library transport has passed a certain amount of tape media across the read/write heads, it informs the LMU, which broadcasts a ‘‘drive needs cleaning’’ notification to all connected hosts. The HSC responds to this by either scheduling an automatic cleaning for the transport, or notifying the operator with a console message. Clean the transport at least once a week even without a message.

Note: Different types of transports require different cleaning cartridge media types. For additional detailed information about controlling automatic cleaning, refer to “MNTD (Mount/Dismount Options) Command and Control Statement” on page 165 and “Tape Transport Cleaning” in the *HSC System Programmer’s Guide*.

Cleaning a Tape Path - Automatic Mode

Automatic Cleaning Function Enabled

The HSC provides an automatic cleaning function which is enabled using the MNTD command (refer to “MNTD (Mount/Dismount Options) Command and Control Statement” on page 165 for details on command syntax and parameters). With auto-cleaning enabled, the LMU broadcast causes the HSC to schedule the mount of a cleaning cartridge for the transport. When the next mount request is received for the transport, the HSC performs a mount/dismount of a cleaning cartridge before satisfying the mount request. Console messages inform the operator of the cleaning operation.

If there are no cleaning cartridges of the correct media type in the ACS that are under the maximum cleaning limit, the operator is prompted to enter additional cleaning cartridges. If there are cleaning cartridges available in the ACS that have exceeded the maximum cleaning limit, the operator can reply to use them to satisfy the cleaning request.

Enabling the auto-cleaning function also enables the CLean command (refer to “CLEAN Command” on page 51 for details on command syntax and parameters). The operator can use this command to schedule cleaning for a transport at any time.

Automatic Cleaning Function Disabled

If the automatic cleaning function is disabled, the operator can use the Mount command to clean a transport (refer to “MOUNT Command” on page 184 for details on command syntax and parameters). The transport recognizes that a cleaning cartridge is mounted, runs the cleaning operation, and unloads the cartridge.

When the HSC issues the message

```
... Drive XXX has been cleaned ...
```

issue an HSC DISMount command to dismount the cartridge (refer to “DISMOUNT Command” on page 60 for details on command syntax and parameters).

Cleaning a Tape Path - Manual Mode

When a transport requires cleaning in a manual mode LSM, the HSC issues a message providing the cell location of the cleaning cartridge and the transport address. Follow this procedure to clean the transport tape path.

1. Enter the LSM.

Warning:

- **Do not enter the LSM until you are familiar with the procedures described in the appropriate StorageTek hardware operator's guide.**
- **StorageTek does not recommend entering an SL8500 library because you must first modify offline four LSMs and up to 64 drives.**

2. Mount a cleaning cartridge in the transport.
3. Dismount the cartridge when it is unloaded.
4. Remove the cartridge from the LSM.

Note: Do not reenter the cleaning cartridge through the CAP: the usage count is set to zero when it is entered.

Cleaning Cartridges

Cleaning cartridges are identified to the HSC by a unique three-character alphabetic prefix, followed by three required numeric values, in their volser. The default is "CLN." All cartridges identified with that prefix make up pools of cleaning cartridges in each LSM. Additionally, any cartridges identified by that prefix are treated exclusively as cleaning cartridges; they cannot be scratched or initialized by HSC utilities.

When a transport requires cleaning, the HSC selects a cartridge from the pool of cleaning cartridges in the LSM that contains the transport (or from the closest LSM that has cleaning cartridges). If no cleaning cartridges exist in the ACS, the operator is prompted with the following message:

```
... No cartridges to clean
{drive XXXX|driveid AA:LL:NN} ACS AA:
Reply "I", "T,capid,volser", or "R" (Ignore, Temp Enter or Retry)
```

Enter some cleaning cartridges, and reply R to the message.

Note: It is recommended to have one cleaning cartridge in the ACS for each transport.

Caution: Do not reenter a cleaning cartridge that has been ejected from the library. All ejected cartridges are deleted from the control data set. When you enter a cleaning cartridge, the HSC considers it to be new and sets the usage counter to zero.

The number of times a cleaning cartridge can be used is globally defined by the MNTD MAXclean command. Usage limits for a specific set of cleaning cartridges can be set with the VOLATTR MAXclean control statement. For example, each time a 9840 cleaning cartridge is used, a new extent of cleaning media is used. When the cleaning media is exhausted, the 9840 cleaning cartridge is ‘‘spent.’’

When a cleaning cartridge exceeds its usage limit, the MNTD EJctauto setting controls whether it is automatically ejected from the library. See the “MNTD (Mount/Dismount Options) Command and Control Statement” on page 165 for details. If an over use-limit cartridge is automatically ejected, the operator is notified by the following message:

```
... Cartridge CLNvvv ejected to CAP CELL AA:LL:CC:RR:CC
```

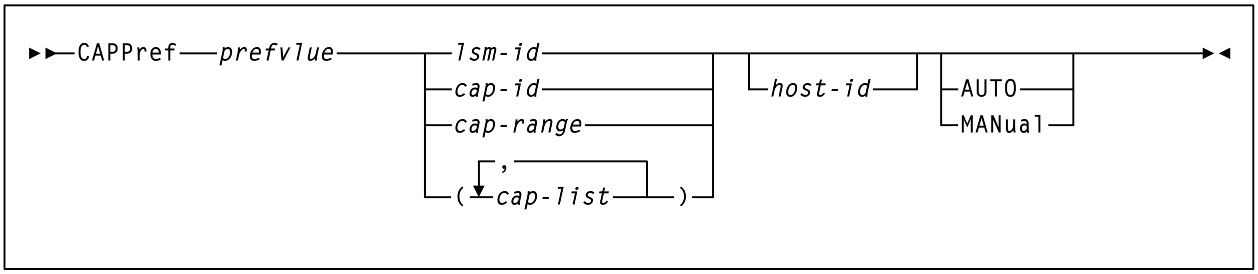
Open the specified CAP and remove the ejected cleaning cartridge and dispose of it.

Appendix A. Commands and Control Statements Syntax Reference

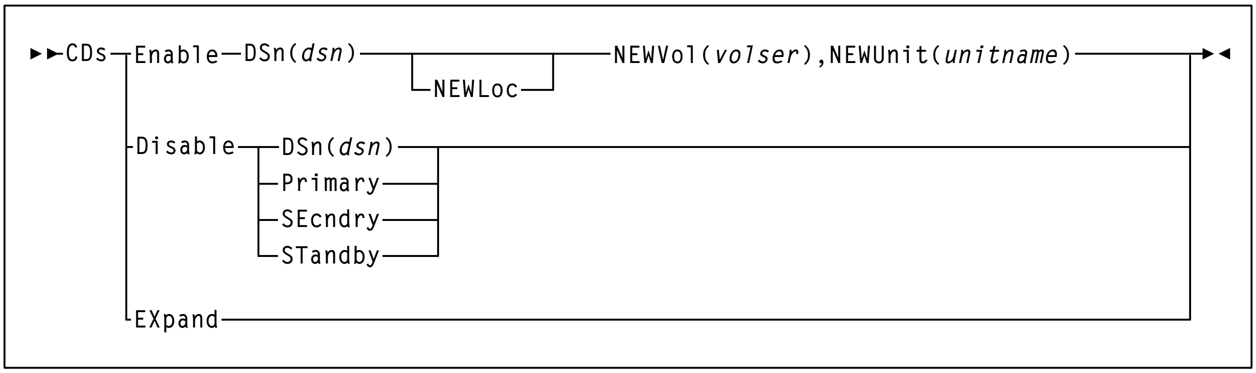
Operator Commands

Refer to Chapter 2, “Commands, Control Statements, and Utilities” on page 15 for complete explanations of command syntax and parameters.

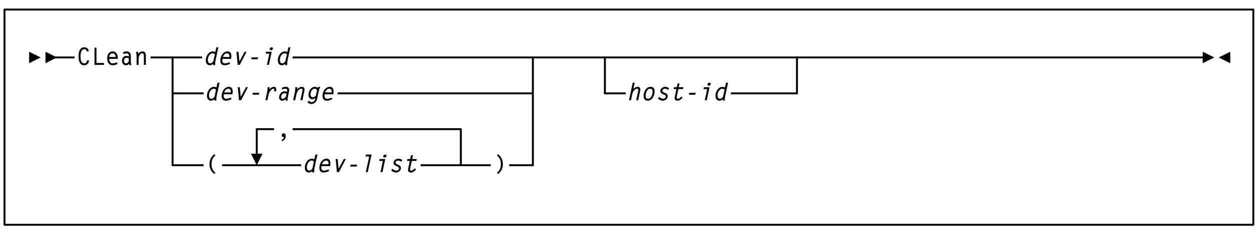
CAP Preference (CAPPref) command and control statement



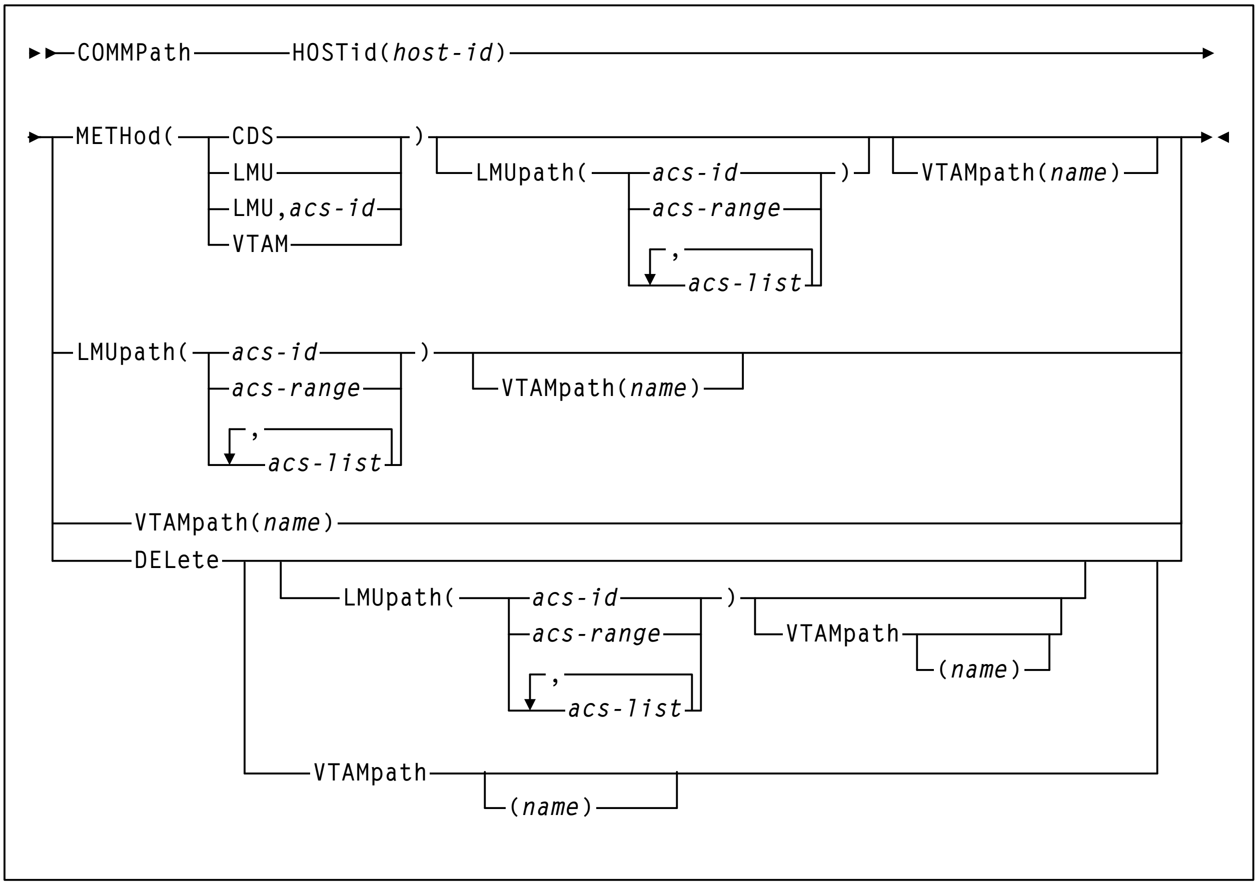
CDS Enable/Disable command



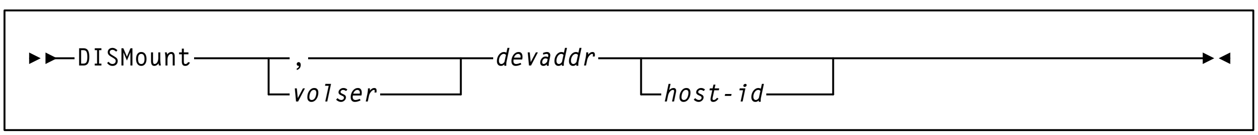
CLean command



Communications Path (COMMPath) command and control statement



DISMount command



Display command

Display Acs

```
►►─Display───Acs─┬─────────────────────────┬──────────────────────────►◄
                 ├─acs-id──────────────────┤
                 ├─acs-range───────────────┤
                 │      ┌─,─────────┐      │
                 └─(────▼───acs-list─┴──)──┘
```

Display ALI

```
►►─Display───ALl──────────────────────────────────────────────────────►◄
```

Display Cap

```
                ┌─(all CAPs)─┐
►►─Display─Cap──┼────────────┼────────────────────────────────────────►◄
                ├─acs-id─────┤
                ├─lsm-id─────┤
                └─cap-id─────┘
```

Display CDS

```
►►─Display───CDS──────────────────────────────────────────────────────►◄
```

Display Cmd

```
►►─Display──┬─CMd─────┬───command-name────────────────────────────────►◄
            └─COmmand─┘
```

Display COMMPath

```
►►─Display──COMMPath─┬─────────────────────────────────────────┬──────►◄
                     │            ┌─*──────────────┐           │
                     └─HOSTid(──┬─┼─ALL────────────┼─)─┘
                                  ├─host-id────────┤
                                  │ ┌─,──────────┐ │
                                  └─▼─host-list──┴─┘
```

Display DRives

```
           ┌─Library──────┐ ┌─ACtive─┐ ┌─BYDrive──┐
►►─Display──DRives─┼─ACS(acs-id)──┼─┼─Idle───┼─┼─BYLoc────┼─┬──────────────┬──►
           └─LSM(lsm-id)──┘ └─All────┘ └─SHOWSlot─┘ ├─DETail───────┤
                                                     └─IDEntity─────┘

►─┬────────────────────────┬─┬──────────────────────────────────────┬──►
  └─MEDia(media-type)──────┘ ├─RECtech(recording-technique)─────────┤
                             └─MODel(model-type)────────────────────┘

►─┬──────────────────────────────────────────┬───────────────────────►◄
  └─Unit(─┬─unit-address────────┬─)──────────┘
          └─unit-address range──┘
```

Display Exceptions

```
►►─Display───┬─EXceptns─┬──────────────────────────────────────────►◄
             └─X────────┘
```

Display LKEYDEF

```
►►─Display──LKEYDEF───────────────────────────────────────────────►◄
```

Display LMUPDEF

```
►►─Display──LMUPDEF──────────────────────────────────────────────────►◄
```

Display LSM

```
►►─Display──Lsm──┬──────────────────────┬────────────────────────────►◄
                 ├─lsm-id───────────────┤
                 ├─lsm-range────────────┤
                 │    ┌─,──────────┐    │
                 └─(──▼─lsm-list───┴─)──┘
```

Display Message

```
►►─Display──┬─Message─┬──msgnum───────────────────────────────────────►◄
            └─Msg─────┘
```

Display MNTD

```
►►─Display───MNTD────────────────────────────────────────────────────►◄
```

Display MONitor

```
►►─Display───MONitor──┬─────────┬──┬──────────────────────┬──────────►◄
                      └─,PGMI───┘  └─,L(──┬─cc─────┬─)────┘
                                          └─name───┘
```

Display OPTion

```
►►─Display───OPTion──────────────────────────────────────────────────►◄
```

Display Requests

```
►►─Display───Requests──────────────────────────────────────────────►◄
```

Display SCRatch

```
►►─Display───SCRatch─┬────────┬┬─────┬┬────────────────────────┬┬────────┬──►◄
                     ├─acs-id─┤└─ALL─┘└─SUBpool(subpool-name)─┘└─DETail─┘
                     └─lsm-id─┘

►─┬──────────────────────────┬───────┬─────────────────────────────────────┬─►◄
  └─MEDia(──media-type──)────┘       └─RECtech(──recording-technique──)────┘
```

Display SCRPDEF

```
►►─Display──SCRPDEF─────────────────────────────────────────────────►◄
```

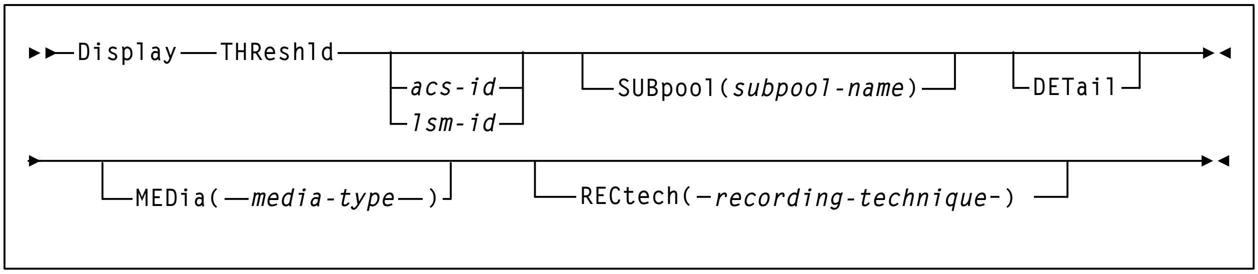
Display SRVlev

```
►►─Display───SRVlev─────────────────────────────────────────────────►◄
```

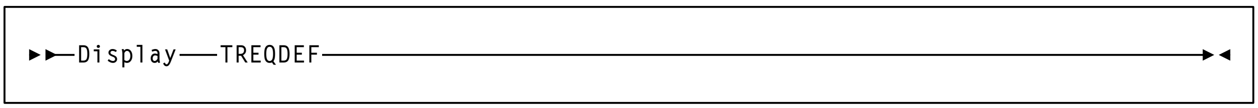
Display Status

```
►►─Display──Status──────────────────────────────────────────────────►◄
```

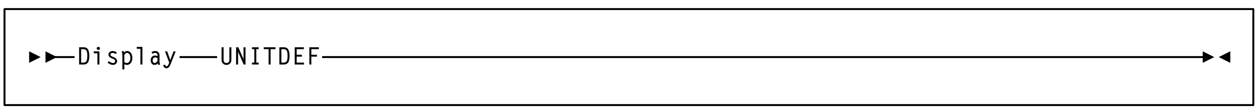
Display THReshld



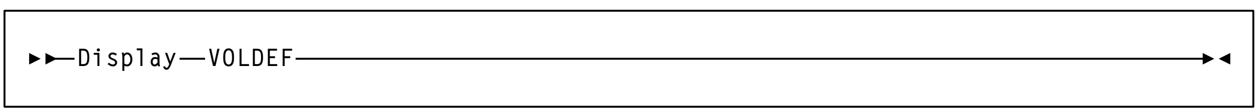
Display TREQDEF



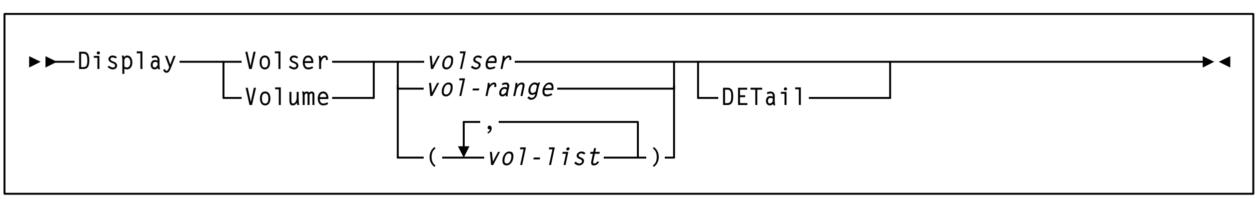
Display UNITDEF



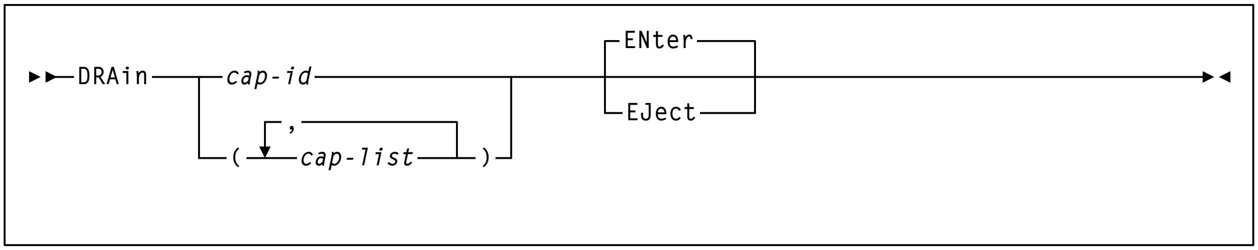
Display VOLDEF



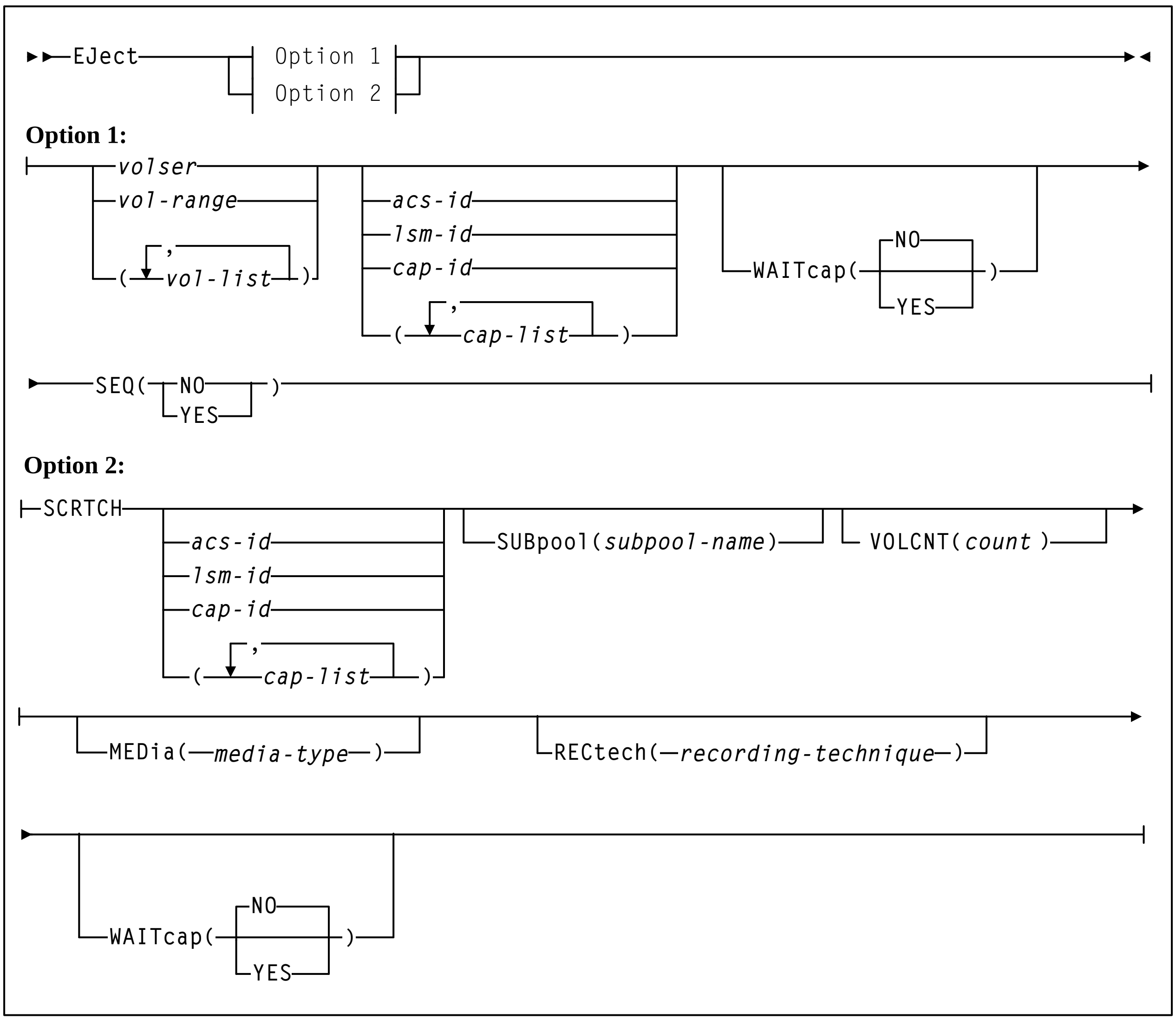
Display Volume



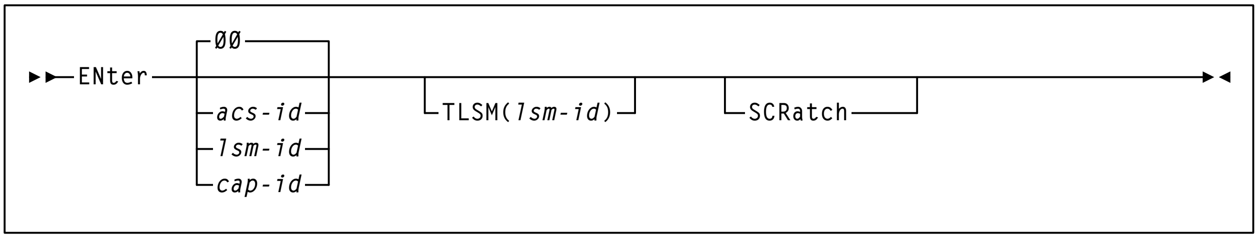
DRAin CAP command



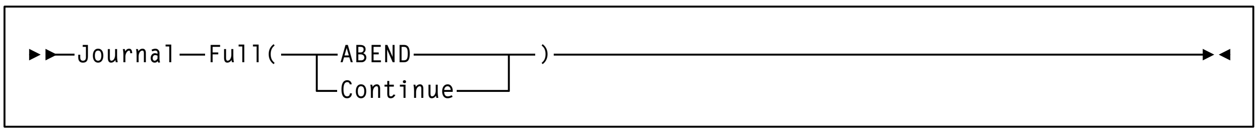
EJect command



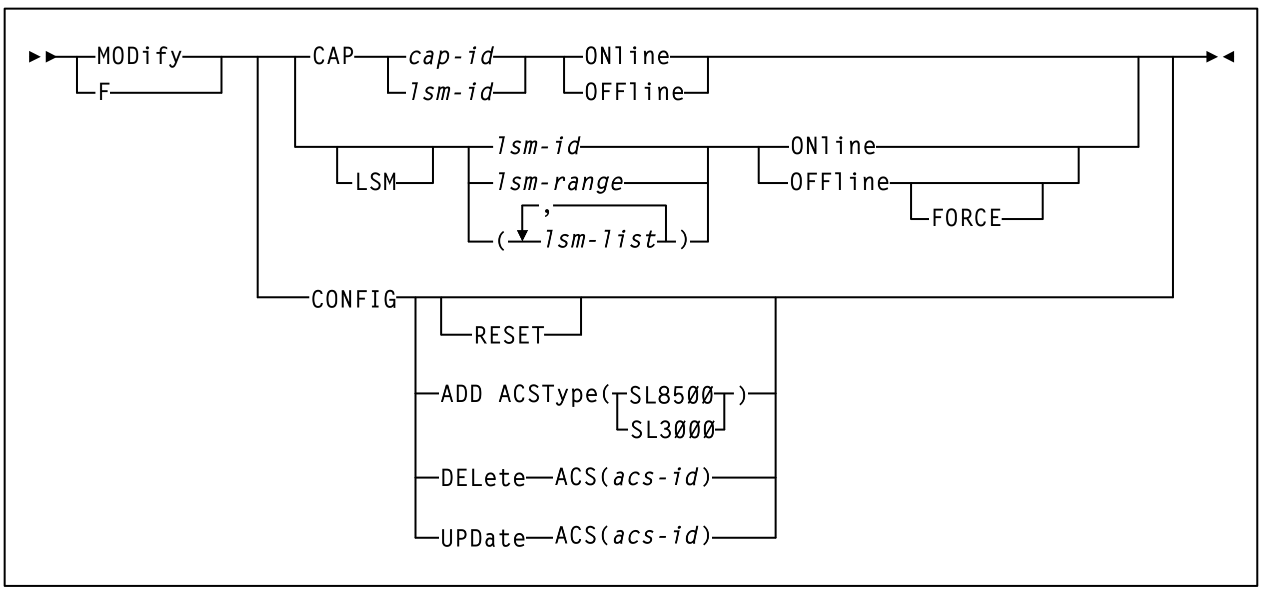
ENter command



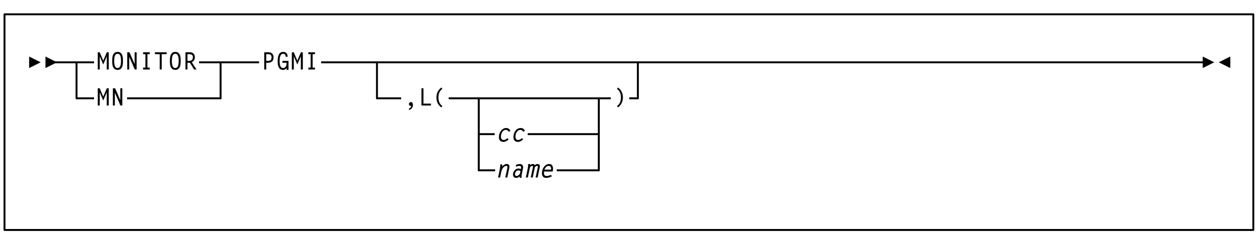
Journal command



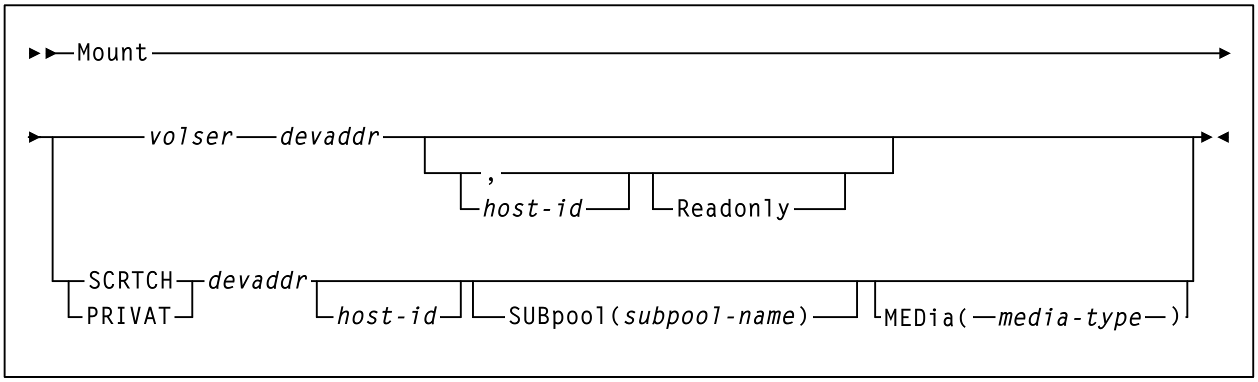
MODify command



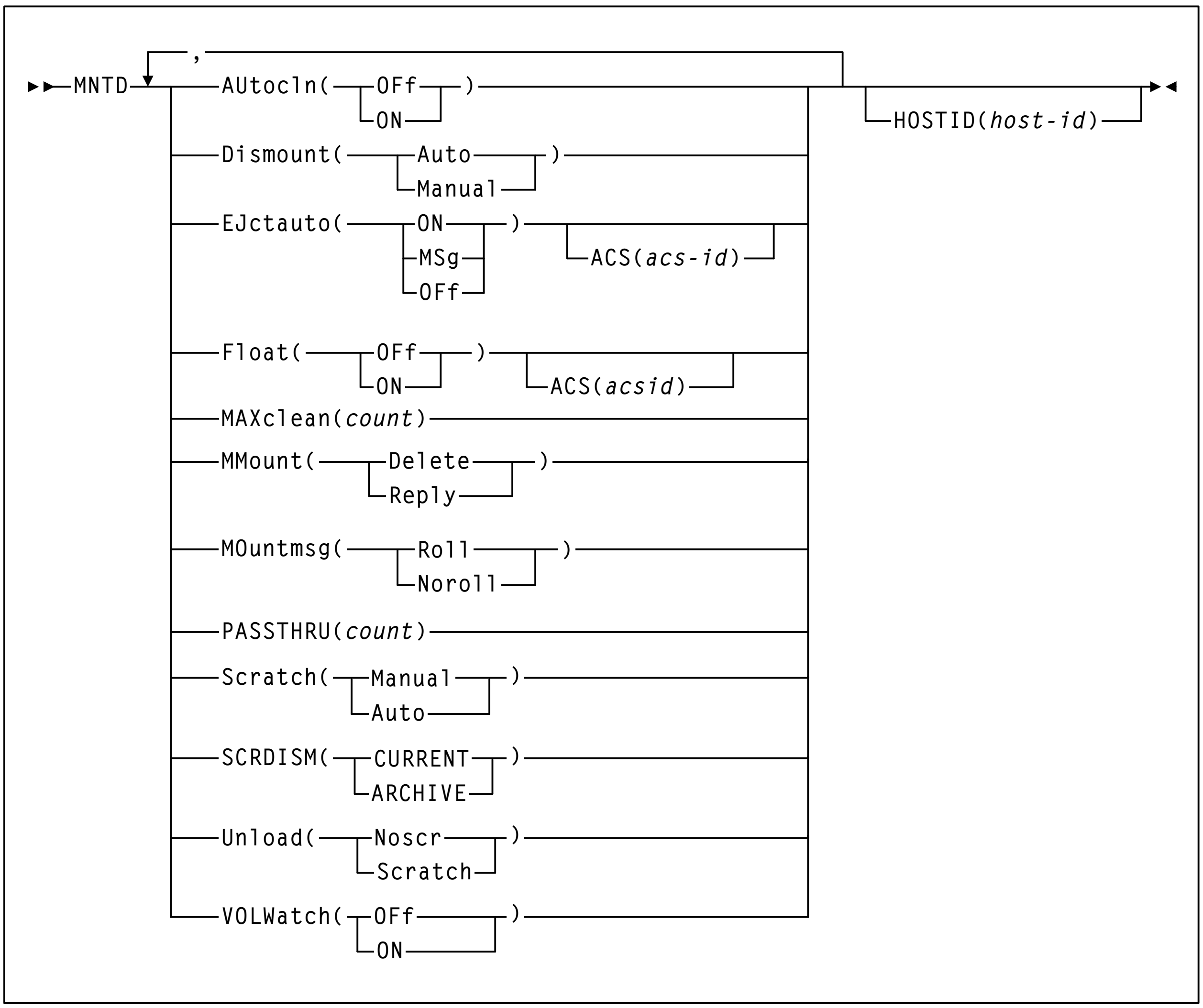
MONITOR command



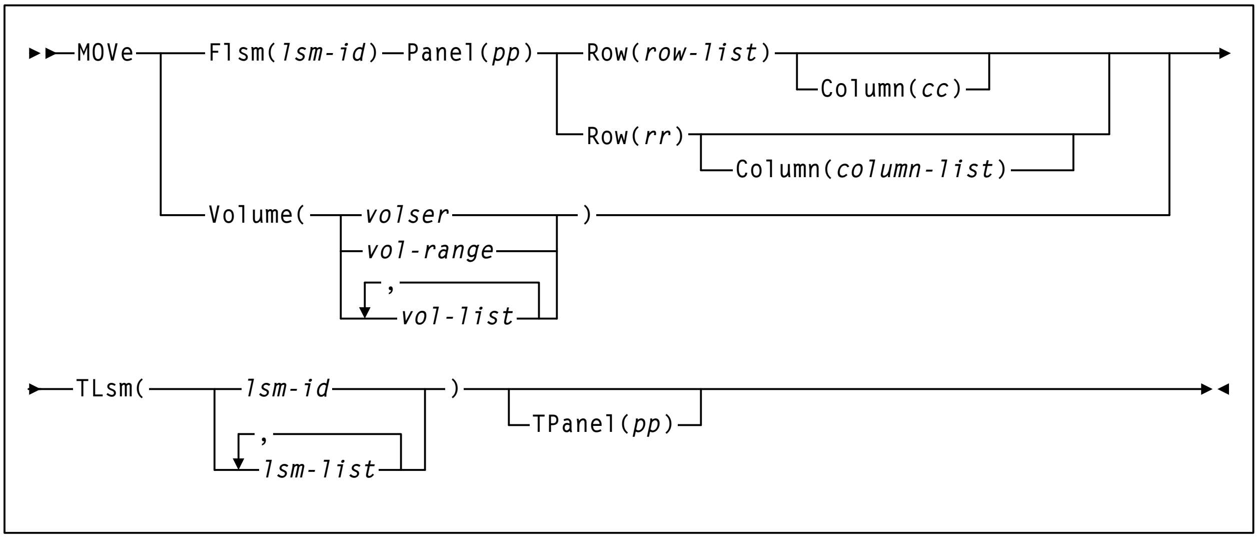
Mount command



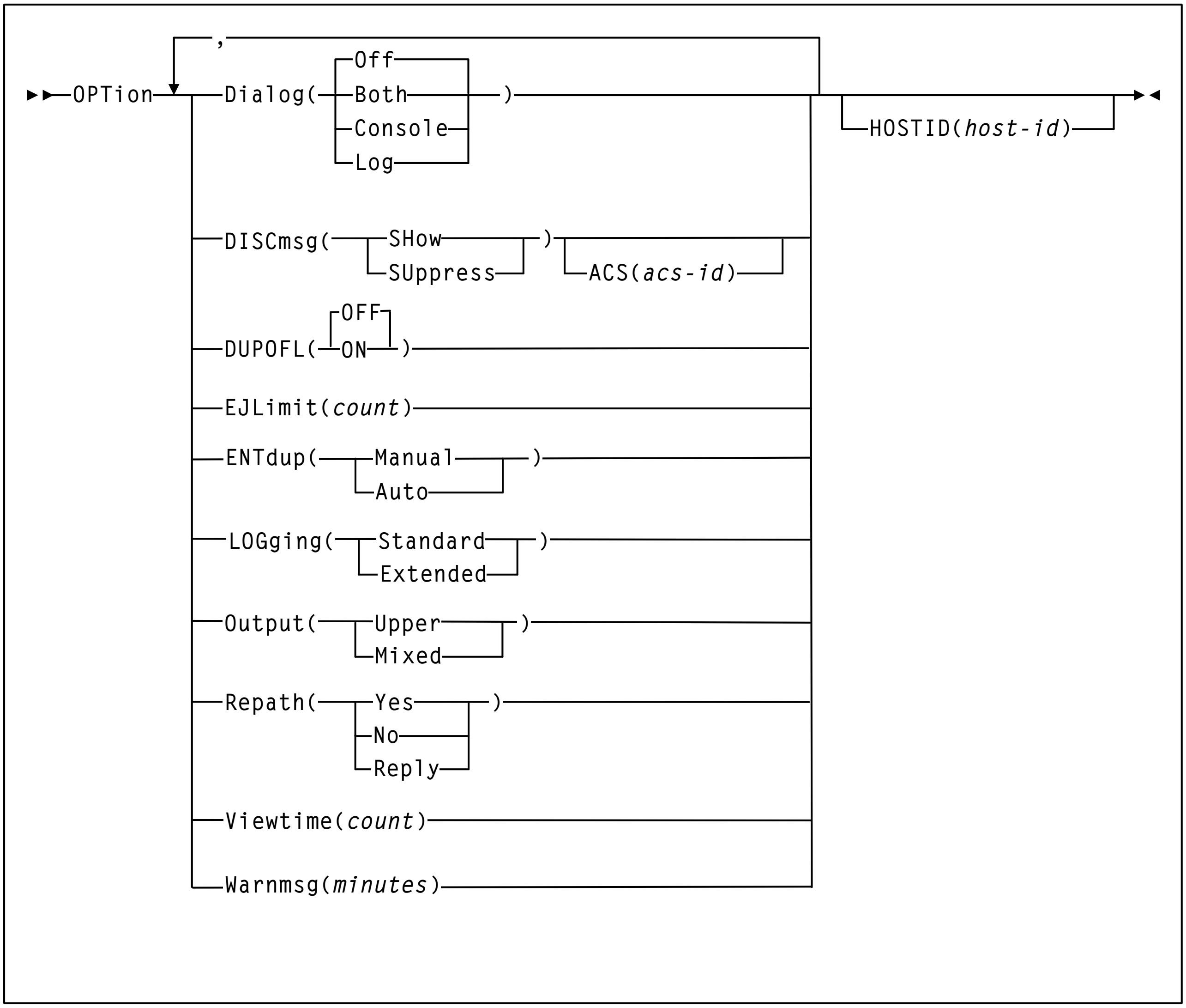
Mount/Dismount Options (MNTD) command and control statement



MOVe command



OPTion command and control statement



RECover Host command

```
►►─RECover──host-id─┬───────┬──────────────────────────────────────►◄
                    └─FORCE─┘
```

RELease CAP command

```
►►─RELease──cap-id─────────────────────────────────────────────────►◄
```

SENter command

```
►►─SENter──────cap-id──────────────────────────────────────────────►◄
```

SRVlev (Service Level) command

```
►►─SRVlev──┬─BASE─┬────────────────────────────────────────────────►◄
           └─FULL─┘
```

Stop Monitoring (STOPMN) command

```
►►─┬─STOPMN─┬──PGMI─┬────────────────────┬─────────────────────────►◄
   └─PM─────┘       └─,L(─┬──────┬─)─────┘
                          ├─cc───┤
                          └─name─┘
```

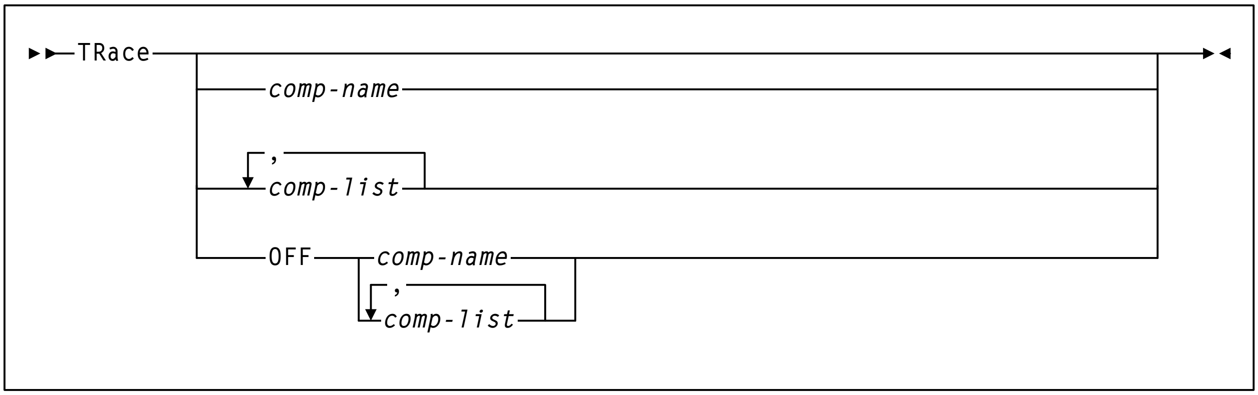
SWitch command

```
►►─SWitch─┬────────────────┬──────────┬─────────────────┬──────────►◄
          └─Acs acs-id(1)──┘          └─LIBrary lib-id──┘
```

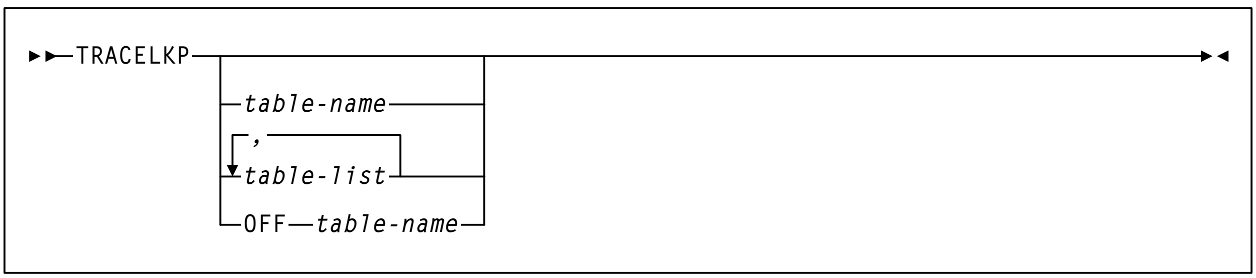
Note:

(1) ACS *acs-id* is optional in a single-ACS environment; it is required in a multiple-ACS environment.

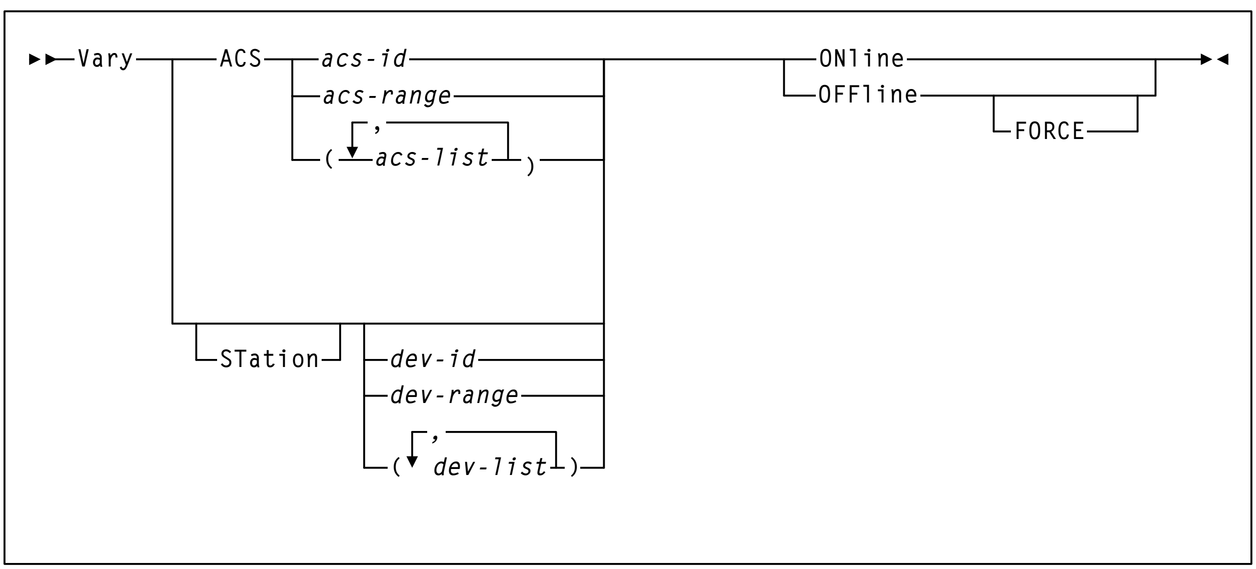
TRace command



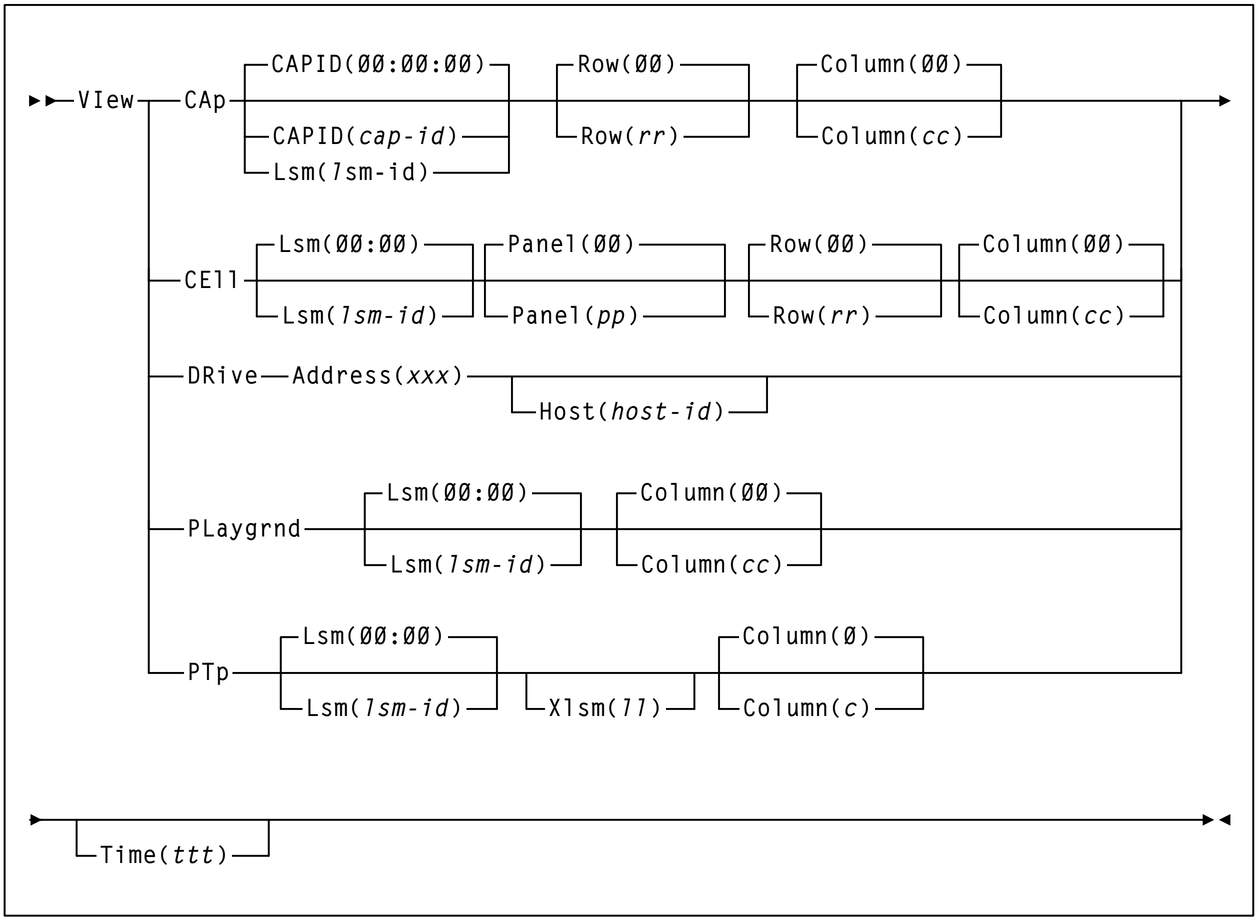
TRACELKP Command



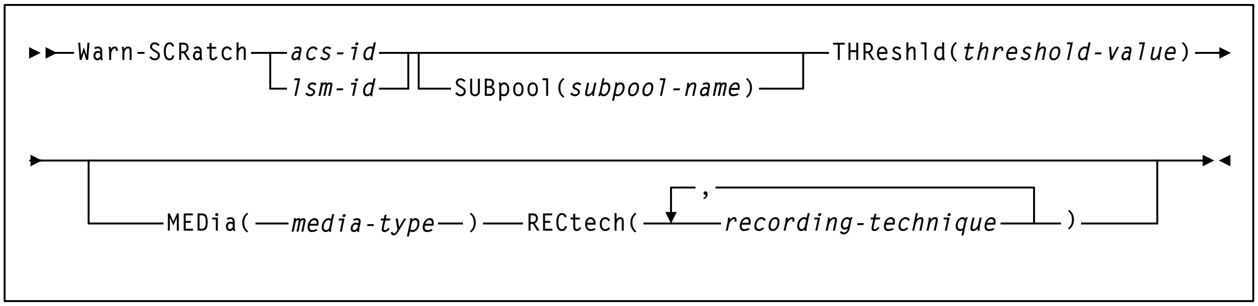
VARY Station command



VIew command



Warn command



Glossary

Terms are defined as they are used in the text. If you cannot find a term here, check the index.

A

AC— Alternating current.

access method— A technique for moving data between processor storage and I/O devices.

ACS— *See* Automated Cartridge System.

ACSid— An ACSid (*acs-id*) is a hexadecimal value from 00 through FF that identifies the LMU. An ACSid is the result of defining the SLIALIST macro during the library generation (LIBGEN) process. The first ACS listed in this macro acquires a hexadecimal identifier of 00, the second acquires a hexadecimal identifier of 01, and so forth, until all ACSs are identified.

allocation— The selection of a cartridge drive, either inside the library or outside (by the SMC software for SMC allocation, or MVS for MVS allocation without the HSC).

APF— Authorized Program Facility.

APPL— VTAM APPLID definition for the HSC.

archiving— The storage of backup files and associated journals, usually for a given period of time.

Automated Cartridge System (ACS)— The library subsystem consisting of one or two LMUs, and from 1 to 16 attached LSMs.

automated library— *See* library.

automatic mode— A relationship between an LSM and all attached hosts. LSMs operating in automatic mode handle cartridges without operator intervention. This is the normal operating mode of an LSM that has been modified online.

B

basic direct access method (BDAM)— An access method used to directly retrieve or update particular blocks of a data set on a direct access device.

basic sequential access method (BSAM)— An access method for storing and retrieving data blocks in a continuous sequence, using either a sequential access or direct access device.

BDAM— *See* Basic direct access method.

beginning-of-tape (BOT)— The location on a tape where written data begins.

block— A collection of contiguous records recorded as a unit. Blocks are separated by interblock gaps, and each block may contain one or more records.

BOT— *See* beginning-of-tape.

BSAM— *See* Basic Sequential Access Method.

buffer— A routine or storage used to compensate for a difference in rate of data flow, or time of occurrence of events, when transferring data from one device to another.

C

CA-1 (TMS)— Computer Associates Tape Management

System— Third-party software by Computer Associates International, Inc.

CAP— *See* Cartridge Access Port.

capacity— *See* media capacity.

CAPid— A CAPid uniquely defines the location of a CAP by the LSM on which it resides. A CAPid is of the form *AAL:CC* where *AA* is the ACSid, *L* is the LSM number, and *CC* is the CAP number. Some commands and utilities permit an abbreviated CAPid format of *AAL*.

cartridge— The plastic housing around the tape. It is approximately 4 inches (100 mm) by 5 inches (125 mm) by 1 inch (25 mm). The tape is threaded automatically when loaded in a transport. A plastic leader block is attached to the tape for automatic threading. The spine of the cartridge contains a Tri-Optic label listing the VOLSER.

Cartridge Access Port (CAP)— An assembly which allows an operator to enter and eject cartridges during automated operations. The CAP is located on the access door of an LSM.

See also standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Cartridge Drive (CD)— A device containing two or four cartridge transports with associated power and pneumatic supplies.

Cartridge Scratch Loader— An optional feature for the Cartridge Drive. It allows the automatic loading of premounted tape cartridges or the manual loading of single tape cartridges.

cartridge system tape— Also known as a Standard tape. The basic tape cartridge media that can be used with 4480, 4490, or 9490 Cartridge Subsystems. They are visually identified by a one-color cartridge case.

CAW— *See* Channel Address Word.

CD— *See* Cartridge Drive.

CDRM— Cross Domain Resource Manager definition (if not using existing CDRMs).

CDRSC— Cross Domain Resource definition.

CDS— *See* control data set.

CE— Channel End.

CEL— Customer Emulation Lab. cell. A storage slot in the LSM that is used to store a tape cartridge.

Central Support Remote Center (CSRC)— *See* Remote Diagnostics Center.

CFT— Customer Field Test.

channel— A device that connects the host and main storage with the input and output control units.

Channel Address Word (CAW)— An area in storage that specifies the location in main storage where a channel program begins.

channel command— A command received by a CU from a channel.

Channel Status Word (CSW)— An area in storage that provides information about the termination of I/O operations.

check— Detection of an error condition.

CI— Converter/Interpreter (JES3).

connected mode— A relationship between a host and an ACS. In this mode, the host and an ACS are capable of communicating (at least one station to this ACS is online).

control data set (CDS)— The data set containing all configuration and volume information used by the host software to control the functions of the automated library. Also known as a library control data set.

See also Primary CDS, Secondary CDS, and Standby CDS.

control data set allocation map— A CDS subfile that marks individual blocks as used or free.

control data set data blocks— CDS blocks that contain information about the library and its configuration or environment.

control data set directory— A part of the CDS that maps its subdivision into subfiles.

control data set free blocks— CDS blocks available for future subfile expansion.

control data set pointer blocks— CDS blocks that contain pointers to map data blocks belonging to a subfile.

control data set recovery area— A portion of the CDS reserved for maintaining integrity for updates that affect multiple CDS blocks.

control data set subfile— A portion of the CDS consisting of Data Blocks and Pointer Blocks containing related information.

Control Unit (CU)— (1) A microprocessor-based unit situated logically between a host channel (or channels) and from two to sixteen transports. It functions to translate channel commands into transport commands, send transport status to the channel(s), and pass data between the channel(s) and transport(s). (2) A device that controls I/O operations for one or more devices. cross-host recovery. The ability for one host to perform recovery for another host that has failed.

CSE— Customer Service Engineer.

CSI— Consolidated System Inventory.

CSL— *See* Cartridge Scratch Loader.

CSRC— Central Support Remote Center (*See* Remote Diagnostics Center)

CST— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard. (3) *See* Cartridge System Tape.

CSW— *See* Channel Status Word.

CU— *See* Control Unit.

D

DAE— Dump Analysis Elimination.

DASD— Direct access storage device.

data— Any representations such as characters or analog quantities to which meaning is, or might be, assigned.

Database Heartbeat record (DHB)— The record that contains the names of the control data sets recorded by the HSC and identifies the correct primary, secondary, and standby CDS.

data class— A collection of allocation and space attributes, defined by the storage administrator, that are used to create a data set.

data compaction— An algorithmic data-reduction technique that encodes data from the host and stores it in less space than unencoded data. The original data is recovered by an inverse process called decompaction.

data-compaction ratio— The number of host data bytes mathematically divided by the number of encoded bytes. It is variable depending on the characteristics of the data being processed. The more random the data stream, the lower the opportunity to achieve compaction.

Data Control Block (DCB)— A control block used by access routines in storing and retrieving data.

data set— The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

data streaming— A continuous stream of data being transmitted in character or binary-digit form, using a specified format.

DC— Direct current.

DCB— *See* Data Control Block.

DD3— A generic value that can be specified on the MEDia and RECtech parameters and includes all types of helical cartridges and recording techniques.

DD3A, DD3B, DD3C, DD3D— Values that can be specified on the MEDia parameter and include only the specified type of helical cartridge. Aliases are A, B, C, and D, respectively.

DDR— *See* Dynamic Device Reconfiguration.

default value— A value assumed when no value has been specified.

demand allocation— An MVS term meaning that a user has requested a specific unit.

device allocation— The HSC function of *influencing* the MVS device selection process to choose either a manual transport or a transport in a particular ACS, based on the location of the volume (specific requests) or the subpool rules in effect (scratch requests).

device group— A subset of the eligible devices. Device groups are defined by esoteric unit names but also may be created implicitly if common devices exist in different device groups.

device number— A four-digit hexadecimal number that uniquely identifies a device attached to a processor.

device separation— *See* drive exclusion.

DFP— Data Facility Product. A program that isolates applications from storage devices, storage management, and storage device hierarchy management.

DFSMS— Refers to an environment running MVS/ESA SP and DFSMS/MVS, DFSORT, and RACF. This environment helps automate and centralize the management of storage through a combination of hardware, software, and policies.

DFSMS ACS routine— A sequence of instructions for having the system assign data class, storage class, management class, and storage group for a data set.

DHB— *See* Database Heartbeat record.

directed allocation— *See* drive prioritization.

disconnected mode— A relationship between a host and an ACS. In this mode, the host and an ACS are not capable of communicating (there are no online stations to this ACS).

DOMed— Pertaining to a console message that was previously highlighted during execution, but is now at normal intensity.

drive exclusion— (previously referred to as *device separation*) refers to the Storage Management Component (SMC) function of excluding drives for an allocation request based on SMC exclusion criteria. See the *SMC Configuration and Administration Guide* for more information.

drive loaded— A condition of a transport in which a tape cartridge has been inserted in the transport, and the tape has been threaded to the beginning-of-tape position.

drive panel— A wall of an LSM that contains tape transports. Drive panels for T9840A transports have either 10 or 20 transports per panel; drive panels for all other transports contain up to four transports per panel.

drive prioritization— (previously referred to as *directed allocation*) refers to the Storage Management Component (SMC) function of influencing selection of a particular drive based on allocation criteria, including volume location. See the *SMC Configuration and Administration Guide* for more information.

DRIVEid— A DRIVEid uniquely defines the location of a tape transport by its location within an LSM. A DRIVEid is of the form *AAL:PP:NN* where *AA* is the ACSid, *L is* the LSM number, *PP* is the panel where the drive is located, and *NN* is the drive number within the panel.

DSI— Dynamic System Interchange (JES3).

dual LMU— A hardware/μ-software feature that provides a redundant LMU capability.

dual LMU HSC— HSC release 1.1.0 or later that automates a switch-over to the standby LMU in a dual LMU configuration.

dump— To write the contents of storage, or of a part of storage, usually from an internal storage to an external medium, for a specific purpose such as to allow other use of storage, as a safeguard against faults or errors, or in connection with debugging.

Dynamic Device Reconfiguration (DDR)— An MVS facility that allows a dismountable volume to be moved and repositioned if necessary, without abnormally terminating the job or repeating the initial program load procedure.

E

ECAP— *See* enhanced CAP.

ECART— (1) Cartridge system tape with a length of 1100 feet that can be used with 4490 and 9490 Cartridge Drives. These tapes are visually identified by a two-tone (black and tan) colored case. (2) A value that can be specified on the MEDia parameter and that includes only 36-track enhanced capacity cartridge system tapes. (3) *See* Enhanced Capacity Cartridge System Tape.

ECCST— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

EDL— *See* eligible device list.

EDTGEN— Eligible Device Table Generation. A process used to replace an installation-defined and named representation of the devices that are eligible for allocation.

EETape— *See* Extended Enhanced Tape.

Effective Recording Density— The number of user bytes per unit of length of the recording medium.

eject— The process where the LSM robot places a cartridge in a Cartridge Access Port (CAP) so the operator can remove it from the LSM.

eligible device list— (1) A group of transports that are available to satisfy an allocation request. (2) For JES2 and JES3, a list of devices representing the UNIT parameter specified by way of invoking JCL. The EDL can contain both library and nonlibrary transports depending on the I/O GEN.

enable— The modification of system, control unit, or device action through the change of a software module or a hardware switch (circuit jumper) position.

enhanced CAP (ECAP)— An enhanced CAP contains two forty-cell magazine-style CAPs and a one-cell priority CAP (PCAP). Each forty-cell CAP holds four removable magazines of ten cells each. An LSM access door with an enhanced CAP contains no cell locations for storing cartridges.

See also Cartridge Access Port, standard CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Enhanced Capacity Cartridge System Tape— Cartridge system tape with increased capacity that can be used with 4490 and 9490 Cartridge Drives. These tapes are visually identified by a two-tone (black and tan) housing.

EOF— End-of-File.

EOT— End-of-Tape marker.

EPO— Emergency Power Off.

EREP— Environmental Recording, Editing, Printing.

ERP— *See* error recovery procedures.

error recovery procedures (ERP)— Procedures designed to help isolate and, where possible, to recover from errors in equipment.

esoteric— A user-defined name that groups devices into classes.

ETAPE— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

Extended Capacity Tape— *See* Enhanced Capacity Cartridge System Tape.

Extended Enhanced Tape (EETape)— A synonym for a ZCART, which is a cartridge that can only be used with a 9490EE drive. An EETape (ZCART) provides greater storage capacity than an ECART.

ExtendedStore Library— 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

FDRPAS™— A product from Innovation Data Processing, Inc. that allows two disk devices to be non-disruptively swapped with each other.

FIFO— First in, first out.

file protected— Pertaining to a tape volume from which data can be read only. Data cannot be written on or erased from the tape.

format— The arrangement or layout of data on a data medium.

frozen panel— A panel to which cartridges cannot be moved. This restriction includes allocating new cartridge locations on a panel as a result of:

- a MOVe command, utility, or PGMI request
- cartridge entry into the ACS
- float, scratch dismount, or scratch redistribution processing.

G

GB— Gigabyte, billion (10^9) bytes.

GDG— Generation Data Group. An MVS data set naming convention. Sequence numbers are appended to the basic data set name to track the generations created for that data set.

GDG Separation— Occurs when a Generation Data Group gets separated because the volumes of different generations reside in different locations. Usually, all generations of a GDG are mounted on a single drive to reduce the number of drives needed for a job.

GTF— Generalized Trace Facility. An MVS facility used to trace software functions and events.

H

HDA— Head/disk assembly.

Helical— A generic value that can be specified on the RECtech parameter and includes all helical transports.

HOSTid— A HOSTid is the host identifier specified in the HOSTID parameter of the SLILIBRY LIBGEN macro. The HOSTid is the SMF system identifier for both JES2 and JES3.

High Watermark Setup (HWS)— In JES3, a setting specified on the HWSNAME initialization statement that reduces the number of devices reserved for a job. JES3 accomplishes this task by assessing each jobstep to determine the maximum number of devices needed for each device type and reserving those devices.

Host Software Component (HSC)— That portion of the Automated Cartridge System which executes on host systems attached to an automated library. This component acts as the interface between the operating system and the rest of the automated library.

host system— A data processing system that is used to prepare programs and the operating environments for use on another computer or controller.

HSC— *See* Host Software Component.

HWS— *See* High Watermark Setup.

I

ICRC— *See* Improved Cartridge Recording Capability.

ID— Identifier or identification.

IDAX— Interpreter Dynamic Allocation Exit. This is a subfunction of the DFSMS/MVS subsystem request (SSREQ 55) that the MVS JCL Interpreter and dynamic allocation functions issue for calling DFSMS ACS routines for management of the data set requested.

IDRC— Improved Data Recording Capability.

IML— *See* Initial Microprogram Load.

Improved Cartridge Recording Capability (ICRC)— An improved data recording mode that, when enabled, can increase the effective cartridge data capacity and the effective data rate when invoked.

index— A function performed by the cartridge scratch loader that moves cartridges down the input or output stack one cartridge position. A scratch loader can perform multiple consecutive indexes.

INISH deck— A set of JES3 initialization statements.

Initial Microprogram Load (IML)— A process that activates a machine reset and loads system programs to prepare a computer system for operation. Processors having diagnostic programs activate these programs at IML execution. Devices running µ-software reload the functional µ-software usually from a floppy diskette at IML execution.

Initial Program Load (IPL)— A process that activates a machine reset and loads system programs to prepare a computer system for operation. Processors having diagnostic programs activate these programs at IPL execution. Devices running µ-software reload the functional µ-software usually from a floppy diskette at IPL execution.

initial value— A value assumed until explicitly changed. It must then be explicitly specified in another command to restore the initial value. An initial value for the HSC is the value in effect when the product is installed.

inline diagnostics— Diagnostic routines that test subsystem components while operating on a time-sharing basis with the functional µ-software in the subsystem component.

input stack— The part of the cartridge loader where cartridges are premounted.

intervention required— Manual action is needed.

IPL— *See* Initial Program Load.

ips— Inches per second.

IVP— Installation Verification Programs. A package of programs that is run by a user after the library is installed in order to verify that the library is functioning properly.

J

JCL— *See* Job Control Language.

Job Control Language— Problem-oriented language designed to express statements in a job that are used to identify the job or describe its requirements to an operating system.

journal— The log associated with journaling. The log (stored in a data set) contains a record of completed work and changes to the control data set since the last backup was created.

journaling— A technique for recovery that involves creating a backup control data set and maintaining a log of all changes (transactions) to that data set.

JST— Job Summary Table (JES3).

K

KB— Kilobyte, thousand (10 3) bytes.

keyword parameter— In command and utility syntax, operands that include keywords and their related values (*See* positional parameter).

Values are concatenated to the keyword either by an equal sign, ‘‘KEYWORD=value,’’ or by parentheses, ‘‘KEYWORD(value).’’ Keyword parameters can be specified in any order. The HSC accepts (tolerates) multiple occurrences of a keyword. The value assigned to a keyword reflects the last occurrence of a keyword within a command.

L

LAN— *See* Local Area Network.

LCU— *See* Library Control Unit.

LED— *See* Light Emitting Diode.

LIBGEN— The process of defining the configuration of the automated library to the host software.

library— An installation of one or more ACSs, attached cartridge drives, volumes placed into the ACSs, host software that controls and manages the ACSs and associated volumes, and the library control data set that describes the state of the ACSs.

library control data set— *See* control data set.

Library Control Unit (LCU)— The portion of the LSM that controls the picking, mounting, dismounting, and replacing of cartridges.

Library Management Unit (LMU)— The portion of the ACS that manages from one to sixteen LSMs and communicates with the host CPU.

Library Storage Module (LSM)— The storage area for cartridges plus the robot necessary to move the cartridges. The term LSM often means the LCU and LSM combined.

Light Emitting Diode (LED)— An electronic device used mainly as an indicator on status panels to show equipment on/off conditions.

Linear Tape Open (LTO)— A technology developed jointly by HP, IBM, and Seagate for new tape storage options. LTO technology is an open format, which means that users have multiple sources of products and media.

LMU— *See* Library Management Unit.

LMUPATH— An HSC control statement contained in the definition data set specified by the LMUPDEF command. An LMUPATH statement allows users to define network LMU attachments.

LMUPDEF— An HSC command used to load the definition data set that contains LMUPATH control statements.

load point— The beginning of the recording area on magnetic tape.

loader— *See* Cartridge Scratch Loader.

Local Area Network (LAN)— A computer network in which devices within the network can access each other for data transmission purposes. The LMU and attached LCUs are connected with a local area network.

logical ejection— The process of removing a volume from the control data set without physically ejecting it from its LSM location.

Logical End Of Tape— A point on the tape where written data normally ends.

LONG— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes (not to be confused with LONGItud). (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

LONGItud— (1) A generic value that can be specified on the RECtech parameter and includes all 18-track and 36-track devices. (2) A generic value that can be specified on the MEDia parameter and includes all standard and enhanced capacity cartridge system tapes.

LSM— *See* Library Storage Module.

LSMid— An LSMid (*lsm-id*) is a hexadecimal value that consists of the ACSid and LSM number separated by a colon (i.e., *AA*:*LL*, where *AA* is the ACSid and *LL* is the LSMid). The LSMid differentiates an LSM from every other LSM in a library.

LSM number— A method used to identify an LSM. An LSM number is the result of defining the SLIACS macro LSM parameter during a LIBGEN. The first LSM listed in this parameter acquires the LSM number of 00 (hexadecimal), the second LSM listed acquires a hexadecimal number of 01, and so forth, until all LSMs are identified (maximum of 24 or hexadecimal 17).

LTO— *See* Linear Tape Open.

LTO*x*— A media type designating either an LTO data cartridge with a capacity between 10GB and 400GB or an LTO cleaning cartridge.

M

machine initiated maintenance— *See* ServiceTek.

magnetic recording— A technique of storing data by selectively magnetizing portions of a magnetizable material.

magnetic tape— A tape with a magnetizable surface layer on which data can be stored by magnetic recording.

magnetic tape drive— A mechanism for moving magnetic tape and controlling its movement.

maintenance facility— Hardware contained in the CU and LMU that allows a CSE and the RDC to run diagnostics, retrieve status, and communicate with respective units through their control panels.

management class— A collection of management attributes, assigned by the storage administrator, that are used to control the allocation and use of space by a data set.

manual mode— A relationship between an LSM and all attached hosts. LSMs operating in manual mode have been modified offline and require human assistance to perform cartridge operations.

master LMU— The LMU currently controlling the functional work of the ACS in a dual LMU configuration.

MB— Megabyte, million (10^6) bytes.

MDS— Main Device Scheduler (JES3).

MEDia— The parameter used to specify media type.

This is not to be confused with MEDIA1 or MEDIA2, which are values that can be specified on the MEDia parameter.

MEDIA1— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

MEDIA2— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

media capacity— The amount of data that can be contained on storage media and expressed in bytes of data.

media mismatch— A condition that occurs when the media value defined in a VOLATTR control statement does not match the media value recorded in the CDS VAR record.

micro-software— *See* µ-software under Symbols.

MIM— Multi-Image Manager. Third-party software by Computer Associates International, Inc.

mixed configurations— Installations containing cartridge drives under ACS control and cartridge drives outside of library control. These configurations cause the Host Software Component to alter allocation to one or the other.

MODel— The parameter used to specify model number.

modem— Modulator/demodulator. An electronic device that converts computer digital data to analog data for transmission over a telecommunications line (telephone line). At the receiving end, the modem performs the inverse function.

monitor— A device that observes, records, and verifies selected system activities to determine significant departure from expected operation.

MSM— Multiple Sessions Management. Third-party software by Computer Associates International, Inc.

N

Near Continuous Operation (NCO) — Facilities and techniques that allow customers to make dynamic changes to the library that do not disrupt the library hardware and environment. In most cases, users can perform these procedures without requiring the HSC to be terminated and restarted.

O

OCR— Optical Character Recognition.

operating system (OS)— Software that controls the execution of programs that facilitate overall system operation.

output stack— The part of the cartridge loader that receives and holds processed cartridges.

over-limit cleaning cartridge— A cleaning cartridge that has been used more than the value (limit) specified by either the MNTD MAXclean or VOLATTR MAXclean settings. This kind of cartridge may not be able to adequately clean a tape transport, however, it can be mounted and will attempt to execute the cleaning process. *See also* spent cleaning cartridge.

over-use cleaning cartridge— A cartridge that has a usage (select) count over the MAXclean value (*see* over-limit cleaning cartridge) or that has used up its cleaning surface (see spent cleaning cartridge).

P

paired-CAP mode— The two forty-cell CAPs in an enhanced CAP function in paired-CAP mode as a single eighty-cell CAP.

PARMLIB control statements— Parameter library (PARMLIB) control statements allow you to statically specify various operation parameters which take effect at HSC initialization. Identifying your system requirements and then specifying the appropriate control statements permits you to customize the HSC to your data center.

pass-thru port (PTP)— A mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

PCAP— *See* priority CAP.

P/DAS— Peer-to-Peer Remote Copy Dynamic Address Switching. An IBM capability to non-disruptively swap PPRC volumes.

Peer-to-Peer Remote Copy (PPRC)— An IBM capability to mirror disk volumes from one storage subsystem to another.

physical end of tape— A point on the tape beyond which the tape is not permitted to move.

playground— The playground is a reserved area of cells where the robot deposits cartridges that it finds in its hands during LSM initialization. Normal LSM initialization recovery processing moves cartridges from the playground cells to either their home cells or their intended destinations, but under abnormal circumstances cartridges may be left in playground cells.

positional parameter— In command and utility syntax, operands that are identified by their position in the command string rather than by keywords (*See* keyword parameter).

Positional parameters must be entered in the order shown in the syntax diagram.

PowderHorn (9310) LSM— A high-performance LSM featuring a high-speed robot. The PowderHorn has a capacity of up to approximately 6000 cartridges.

PPRC— *See* Peer-to-Peer Remote Copy.

primary CDS— The active control data set. It contains the inventory of all cartridges in the library, the library configuration, information about library hardware and resource ownership across multiple processors, and serves as a vehicle of communication between HSCs running on multiple processors.

priority CAP (PCAP)— A one-cell CAP that is part of an enhanced CAP. A PCAP allows a user to enter or eject a single cartridge that requires immediate action.

See also Cartridge Access Port, standard CAP, enhanced CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Program Temporary Fix (PTF)— A unit of corrective maintenance delivered to a customer to repair a defect in a product, or a means of packaging a Small Programming Enhancement (SPE).

Program Update Tape (PUT)— A tape containing a collection of PTFs. PUTs are shipped to customers on a regular basis under the conditions of the customer's maintenance license.

PTF— *See* Program Temporary Fix.

PTP— *See* pass-thru port.

PUT— *See* Program Update Tape.

Q

QSAM— *See* Queued Sequential Access Method.

Queued Sequential Access Method (QSAM)— An extended version of the basic sequential access method (BSAM). When this method is used, a queue is formed of input data blocks that are awaiting processing or output data blocks that have been processed and are awaiting transfer to auxiliary storage or to an output device.

R

RACF— *See* Resource Access Control Facility.

RDC— *See* Remote Diagnostics Center.

Recording Density— The number of bits in a single linear track measured per unit of length of the recording medium.

RECtech— The parameter used to specify recording technique.

RedWood— (1) The program name of the StorageTek transport that supports a helical recording technique. (2) *See* SD-3.

Remote Diagnostics Center (RDC)— The Remote Diagnostics Center at StorageTek. RDC operators can access and test StorageTek systems and software, through telecommunications lines, from remote customer installations. Also referred to as the Central Support Remote Center (CSRC).

Resource Access Control Facility (RACF)— Security software controlling access to data sets.

S

SCP— *See* System Control Program.

scratch tape subpool— A defined subset of all scratch tapes. Subpools are composed of one or more ranges of VOLSERs with similar physical characteristics (type of volume {reel or cartridge}, reel size, length, physical location, etc.). Some installations may also subdivide their scratch pools by other characteristics, such as label type (AL, SL, NSL, NL).

The purpose of subpooling is to make sure that certain data sets are built only within particular ranges of volumes (for whatever reason the user desires). If a volume which does not belong to the required subpool is mounted for a particular data set, it is dismounted and the mount reissued.

SD-3— The model number of the StorageTek transport that supports a helical recording technique.

SDLT— *See* SuperDLT.

SDLT*x*— A media type designating an SDLT data cartridge with a capacity of either 125GB or 160GB.

secondary CDS— The optional duplicate copy of the primary CDS.

secondary recording— A technique for recovery involving maintaining both a control data set and a copy (secondary) of the control data set.

SEN — *See* Significant Event Notification.

SER— Software Enhancement Request.

ServiceTek (machine initiated maintenance)— A unique feature of the ACS in which an expert system monitors conditions and performance of subsystems and requests operator attention before a potential problem impacts operations. Customers can set maintenance threshold levels.

servo— A device that uses feedback from a sensing element to control mechanical motion.

Shared Tape Allocation Manager (STAM)— Third-party software by Computer Associates International, Inc.

Significant Event Notification (SEN) — An HSC facility that allows an application to request notification of specific HSC and VTCS events.

Silverton— *See* 4490 Cartridge Subsystem.

SL3000 library— *See* StreamLine (SL3000) library.

SL8500 library— *See* Streamline (SL8500) library.

Small Programming Enhancement (SPE)— A supplement to a released program that can affect several products or components.

SMC— Storage Management Component.

SMF— System Management Facility. An MVS facility used to record system actions which affect system functionality.

SMP— System Modification Program.

SMP/E— *See* System Modification Program Extended.

SMS— Storage Management Subsystem.

SPE— *See* Small Programming Enhancement.

special use cartridge— A generic description for a type of cartridge used on T9840A drives. These include:

- T9840A cleaning cartridge
- T9840A microcode load cartridge
- T9840A dump collection cartridge.

When an attempt is made to mount a special use cartridge, LMU error response code 1012 is generated.

The error code is defined as “load failure for special use cartridge.”

If the error code is received for a special use cleaning cartridge, it is either ejected or marked as unusable, and it is retained in the ACS (depending on the MNTD EJctauto setting). The HSC does not mount unusable cartridges.

spent cleaning cartridge— A cleaning cartridge that has exhausted its cleaning material and can no longer be used to clean tape transports. *See also* over-limit cleaning cartridge.

SSD— Solid state disk.

STAM— *See* Shared Tape Allocation Manager.

Standard— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) *See* Cartridge System Tape.

standard CAP— A standard CAP has a capacity of twenty-one cartridges (three rows of seven cells each). An LSM access door with a standard CAP contains cell locations for storing cartridges.

See also Cartridge Access Port, enhanced CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

standard (4410) LSM— An LSM which provides a storage capacity of up to approximately 6000 cartridges.

standby— The status of a station that has been varied online but is connected to the standby LMU of a dual LMU ACS.

standby CDS— The optional data set that contains only one valid record, the Database Heartbeat (DHB). The DHB contains the names of the control data sets recorded by the HSC and is used to identify the correct primary, secondary, and standby CDS.

standby LMU— The redundant LMU in a dual LMU configuration that is ready to take over in case of a master LMU failure or when the operator issues the SWitch command.

station— A hardware path between the host computer and an LMU over which the HSC and LMU send control information.

STD— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

STK1— A generic value that can be specified on the MEDia and RECtech parameters and includes all types of T9840A cartridges and recording techniques.

STK1R— Value that can be specified on the MEDia and RECtech parameters and includes only the specified type of T9840A cartridge or recording technique. STK1R can be abbreviated as R.

STK1U— Value that can be specified on the MEDia parameter and includes the specified types of T9840A, T9840B, and T9840C cleaning cartridges. STK1U can be abbreviated as U.

STK1Y— Value that can be specified on the MEDia parameter and includes only the specified type of T9840D cleaning cartridge. STK1Y can be abbreviated as Y.

STK2— A generic value that can be specified on the MEDia parameter and includes all types of 9940 cartridges and recording techniques.

STK2P— Value that can be specified on the MEDia and RECtech parameters and includes only the specified type of 9940 cartridge or recording technique. STK2P can be abbreviated as P.

STK2W— Value that can be specified on the MEDia parameter and includes only the specified type of 9940 cleaning cartridge. STK2W can be abbreviated as W.

storage class— A named list of storage attributes that identify performance goals and availability requirements for a data set.

storage group— A collection of storage volumes and attributes defined by the storage administrator.

Storage Management Component (SMC)— Required NCS software component that performs the allocation function for NCS, replacing the functions previously performed by HSC and MVS/CSC. The SMC resides on the MVS host with HSC and/or MVS/CSC, and communicates with these products to determine policies, volume locations, and drive ownership.

StreamLine (SL3000) library— A modular library that can scale from 200 to 4500 cartridges in mainframe, Windows, UNIX, and supercomputer environments.The SL3000 utilizes hot swap components and multiple robots.

StreamLine (SL8500) library— A modular library that can scale from 1,500 to over 200,000 cartridges in mainframe, Windows, UNIX, and supercomputer environments.The SL8500 utilizes hot swap components and multiple robots.

StreamLine CAP— The StreamLine CAP contains 3, 13-cell removable magazines. You can also add an optional CAP that has the same configuration.

SuperDLT— The next generation of DLT (Digital Linear Tape) products, which remains a standard for mid-range operating systems.

switchover— The assumption of master LMU functionality by the standby LMU.

SYNCSORT— Third-party software by Syncsort, Inc.; a sort, merge, copy utility program.

System Control Program— The general term to describe a program which controls access to system resources, and allocates those resources among executing tasks.

system-managed storage— Storage that is managed by the Storage Management Subsystem, which attempts to deliver required services for availability, performance, space, and security applications.

System Modification Program Extended— An IBM-licensed program used to install software and software maintenance.

T

T10000 Tape Drive— A cartridge tape drive that features a 500GB (T10000A), 1TB (T10000B), or 5TB (T10000C) cartridge capacity and data transfer rates up to 120MB/sec. In addition, the T10000 offers media reusability for at least two generations and device-based encryption.

tape cartridge— A container holding magnetic tape that can be processed without separating it from the container.

tape drive— A device that is used for moving magnetic tape and includes the mechanisms for writing and reading data to and from the tape.

tape unit— A device that contains tape drives and their associated power supplies and electronics.

TAPEREQ— An SMC control statement that is contained in the definition data set specified by the TREQDEF command. A TAPEREQ statement defines a specific tape request. It is divided into two parts, the input: job name, step name, program name, data set name, expiration date or retention period, and an indication for specific requests or nonspecific (scratch) requests; and the output: media type and recording technique capabilities.

TDMF™— Transparent Data Migration Facility. A product from Softek Storage Solutions Corp. that allows two disk devices to be non-disruptively swapped with each other.

Timberline— *See* 9490 Cartridge Subsystem.

Timberline EE— *See* 9490EE Cartridge Subsystem.

TimberWolf (9740) LSM— A high performance LSM that provides a storage capacity of up to 494 cartridges. Up to 10 drives (STD, 4490, 9490, 9490EE, T9840A, and SD-3) can be configured. TimberWolf LSMs can only attach to other TimberWolfs.

TimberWolf CAP— The TimberWolf CAP contains either a 10-cell removable magazine or a 14-cell permanent rack. It is not necessary to define a configuration; the HSC receives CAP information directly from the LMU.

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, or WolfCreek optional CAP.

TP— Tape-to-Print.

transaction— A short series of actions with the control data set. These actions are usually related to a specific function (e.g., Mount, ENter).

transport— An electromechanical device capable of threading tape from a cartridge, moving the tape across a read/write head, and writing data onto or reading data from the tape.

TREQDEF— An SMC command that is used to load the definition data set that contains TAPEREQ control statements.

Tri-Optic label— An external label attached to the spine of a cartridge that is both human and machine readable.

TT— Tape-to-Tape.

U

unit affinity— A request that all cartridges be mounted on a single drive (either for read or write purposes), usually to reduce the number of drives needed for a job.

unit parameter value— A JCL term meaning the value of a JCL UNIT parameter. The value can be a single address of a drive, an esoteric list, or a generic list.

UNITATTR— An SMC control statement that defines the transport's media type and recording technique capabilities.

utilities— Utility programs. The programs that allow an operator to manage the resources of the library and to monitor overall library performance.

V

VAR— *See* Volume Attribute Record.

VAT— *See* Volume Attribute Table Entry.

Virtual Storage Manager (VSM)— A storage solution that virtualizes volumes and transports in a VTSS buffer in order to improve media and transport use.

Virtual Tape Control System (VTCS)— The primary host code for the Virtual Storage Manager (VSM) solution. This code operates in a separate address space, but communicates closely with HSC.

Virtual Tape Storage Subsystem (VTSS)— The DASD buffer containing virtual volumes (VTVs) and virtual drives (VTDs). The VTSS is a StorageTek RAID 6 hardware device with microcode that enables transport emulation. The RAID device can read and write "tape" data from/to disk, and can read and write the data from/to a real tape drive (RTD).

virtual thumbwheel— An HSC feature that allows read-only access to a volume that is not physically write-protected.

VOLATTR— An HSC control statement that is contained in the definition data set specified by the VOLDEF command. A VOLATTR statement defines to the HSC the media type and recording technique of the specified volumes.

VOLDEF— An HSC command that is used to load the definition data set that contains VOLATTR control statements.

VOLSER— A six-character alphanumeric label used to identify a tape volume.

volume— A data carrier that is mounted or dismounted as a unit. (*See* cartridge).

Volume Attribute Record (VAR)— An HSC internal record that contains the data base-resident information of a cartridge entered into the library.

Volume Attribute Table Entry (VAT)— An HSC internal table that contains entries to the intransit record token and the Volume Attribute Record (VAR). The VAT is used as the communications area for internal service calls.

W

WolfCreek (9360) LSM— A smaller capacity high-performance LSM. WolfCreek LSMs are available in 500, 750, and 1000 cartridge capacities (model numbers 9360-050, 9360-075, and 9360-100, respectively). WolfCreek LSMs can be connected by pass-thru ports to 4410, 9310, or other WolfCreek LSMs.

WolfCreek CAP— The standard WolfCreek CAP contains a 20-cell magazine-style CAP and a priority CAP (PCAP).

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek optional CAP, or TimberWolf CAP.

WolfCreek optional CAP— The WolfCreek optional CAP contains a 30-cell magazine-style CAP which is added to the standard WolfCreek CAP.

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, or TimberWolf CAP.

Write Tape Mark (WTM)— The operation performed to record a special magnetic mark on tape. The mark identifies a specific location on the tape.

WTM— *See* Write Tape Mark.

WTO— Write-to-Operator.

WTOR— Write-to-Operator with reply.

Z

ZCART— (1) Cartridge system tape with a length of 2200 feet that can be used only with 9490EE Cartridge Drives. (2) A value that can be specified on the MEDia parameter and that includes only 36-track 9490EE cartridge system tapes. (3) *See also* Extended Enhanced Tape.

Symbols

µ-software— Microprogram. A sequence of microinstructions used to perform preplanned functions and implement machine instructions.

Numerics

18-track— A recording technique that uses 18 tracks on the tape. The tape is written in only the forward motion.

18track— A generic value that can be specified on the RECtech parameter and includes all 18-track transports.

3480— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

3480X— The 3480 upgrade that supports ICRC.

3490— The IBM cartridge drive that replaced the 3480X and supports ICRC but not 36-track or long tape. It is equivalent to the IBM 3480X.

3490E— (1) The IBM cartridge drive that replaced the 3490 and supports ICRC, 36-track, and long tape. It reads 18-track but does not write 18-track. (2) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (3) An alias of ECART.

3590— The IBM cartridge drive that supports 128-track recording and holds 10GB of uncompressed data. It has the same form factor as a 3490E.

36-track— A recording technique that uses 36 tracks on the tape. 18 tracks of data are written in the forward motion and then an additional 18 tracks in the backward motion for a total of 36.

36track— A generic value that can be specified on the RECtech parameter and includes all 36-track transports.

36Atrack— A value that can be specified on the RECtech parameter and includes only 4490 (Silverton) 36-track transports.

36Btrack— A value that can be specified on the RECtech parameter and includes only 9490 (Timberline) 36-track transports.

36Ctrack— A value that can be specified on the RECtech parameter and includes only 9490EE (Timberline EE) transports.

4410 LSM— *See* standard LSM.

4480 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 18-track recording format. The StorageTek 4480 Cartridge Subsystem is equivalent to a 3480 device.

4490 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 36-track recording format and extended capacity tape. 4490 transports can also read data recorded in 18-track format. The StorageTek 4490 Cartridge Subsystem is equivalent to a 3490E device.

3000 library— *See* StreamLine Library (SL3000).

8500 library— *See* StreamLine (SL8500) library.

9310 LSM— *See* PowderHorn LSM.

9360 LSM— *See* WolfCreek LSM.

9490 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 36-track recording format and extended capacity tape and provide improved performance over the 4490 Cartridge Subsystem. 9490 transports can also read data recorded in 18-track format. The StorageTek 9490 Cartridge Subsystem offers better performance (faster data transfer rate, faster load/unload) than a 3490E device.

9490EE Cartridge Subsystem— A high-performance tape transport that provides read/write capability for Extended Enhanced tape (EETape) cartridges. It is functionally equivalent to the IBM 3490E device.

9740 LSM— *See* TimberWolf LSM.

T9840A Cartridge Subsystem— A high performance tape transport for enterprise and open systems environments that reads and writes T9840A cartridges. T9840As can be defined in 10-drive and 20-drive panel configurations. The T9840A can perform as a standalone subsystem with a cartridge scratch loader attached, or it can be attached to a StorageTek ACS.

T9840B—The StorageTek cartridge transport that reads and writes T9840B cartridges.

T9840C— The StorageTek cartridge transport that reads and writes T9840C cartridges.

T9840D— The StorageTek cartridge transport that reads and writes T9840D cartridges

T9940A— The StorageTek capacity-centric cartridge transport capable of reading and writing 60GB T9940A cartridges.

T9940B— The StorageTek capacity-centric cartridge transport capable of reading and writing 200GB T9940B cartridges.

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