

SCSI Library Manager Management Guide

June, 1991

This guide explains how to install, configure, manage, and troubleshoot the SCSI Library Manager.

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Contents

PREFACE	v
---------	---

CHAPTER 1 OVERVIEW OF SLM CONCEPTS	1-1
---	------------

1.1 JUKEBOX	1-1
-------------	-----

CHAPTER 2 INSTALLATION AND SETUP	2-1
---	------------

2.1 PREPARING TO RUN THE INSTALLATION PROCEDURE	2-1
---	-----

2.2 INSTALLING LICENSE PAKS	2-1
-----------------------------	-----

2.3 RUNNING VMSINSTAL	2-4
-----------------------	-----

CHAPTER 3 OVERVIEW AND OPERATION OF SLM	3-1
--	------------

3.1 STARTUP	3-1
-------------	-----

3.2 USER SETUP	3-2
----------------	-----

3.3 EXECUTING SLM	3-2
-------------------	-----

3.4 POPULATING THE JUKEBOX	3-2
----------------------------	-----

3.5 EVACUATING THE JUKEBOX	3-3
----------------------------	-----

Contents

CHAPTER 4	OVERVIEW AND OPERATION OF SLA	4-1
4.1	STARTUP	4-1
4.2	OPERATIONAL DESCRIPTION	4-1
4.3	MESSAGE FLOW	4-1
4.4	SLA LOGGING	4-2

PART II COMMAND REFERENCE

ADD	SLM-3
BUILD_DCL_SYMBOLS	SLM-4
CLEAR	SLM-5
CREATE	SLM-6
DISMOUNT	SLM-8
EXIT	SLM-9
FLIP	SLM-10
HELP	SLM-11
INITIALIZE	SLM-12
LIST	SLM-13
MODIFY	SLM-14
MOUNT	SLM-15
NAME	SLM-17
QUIT	SLM-18
RELABEL	SLM-19
REMOVE	SLM-20
SET	SLM-21
SHOW	SLM-22

PART III LANGUAGE REFERENCE

SLM\$R_MAP_IMAGE	LR-3
SLM\$R_SCSI_DISMOUNT	LR-4
SLM\$R_SCSI_FLIP	LR-6
SLM\$R_SCSI_LOAD	LR-7
SLM\$R_SCSI_LOCK	LR-8
SLM\$R_SCSI_MOUNT	LR-9
SLM\$R_SCSI_PASSTHRU	LR-11
SLM\$R_SCSI_UNLOAD	LR-13
SLM\$R_SCSI_UNLOCK	LR-14

APPENDIX A CONTROLLER CONFIGURATIONS **A-1**

A.1 CMD TECHNOLOGY CQD AND CBI CONTROLLERS **A-1**

A.2 GENERIC SCSI DRIVER **A-1**

A.3 SERIAL SUPPORT **A-2**

APPENDIX B ERROR CODES **B-1**

INDEX

EXAMPLES

2-1 Sample VMSLICENSE session _____ **2-2**

2-2 Sample VMSINSTAL session _____ **2-5**

Preface

The **SCSI LIBRARY MANAGER MANAGEMENT GUIDE** presents information needed to operate, to manage, and to troubleshoot a Jukebox system.

Structure of the Document

The document is divided into three sections:

- Overview
- Command Reference
- Programmer support

Intended Audience

This guide is intended for anyone who is responsible for initializing, maintaining, and/or managing a SLM controlled Jukebox system.

1

Overview of SLM Concepts

The purpose of this overview is to explain the basic SLM concepts. This overview will explain how the various parts of SLM work and how they are used in conjunction with a Jukebox.

1.1 Jukebox

SLM works in conjunction with the CMD SCSI Jukebox Controller to provide host access to a variety of Jukebox devices. Most jukeboxes have a basic set of functions which SLM is based on.

A jukebox consists of three basic components:

- 1 Inlets
- 2 Slots
- 3 Drives

An Inlet is the mechanism used to insert/extract cartridges to/from a jukebox. This is often referred to as the import/export slot. Most jukeboxes only have one inlet but SLM has been designed to work with any number of inlets.

Cartridges are stored in what are referred to as Slots. A slot is nothing more than a storage location within the jukebox. Cartridges are stored into slots by loading a cartridge from the Inlet and placing it in a Slot. Each manufacture of jukeboxes may have a different number of storage slots so SLM has been designed around a configurable quantity.

Drives are the actual disk drives that are connected to the system for access to the data on a loaded cartridge. A jukebox must have at least one disk drive to be useful and can have many more than one. Cartridges are moved into drives by loading stored cartridges from their slot to the destination disk drive. This act is referred to as Mounting a cartridge into a drive.

2

Installation and Setup

This chapter describes how to prepare for installation and how to install the SLM distribution software onto your VMS host. To install the software, use VMSINSTAL, which is part of the VMS operating system.

VMSINSTAL is an automated procedure that:

- Creates a directory specified by the user for SLM to reside.
- Copies the files from the distribution into appropriate directories.
- Creates startup and login command procedures.

2.1 Preparing to Run the Installation Procedure

Before you actually run the installation procedure, follow these steps:

- 1 Determine the location of where SLM should reside. The default and preferred location is SYS\$COMMON:[SLM]
- 2 Check that there is at least 2000 blocks of free disk space on the system disk.
- 3 Read and understand the jukebox specific installation information.
- 4 Register all license PAKs into the License Management Facility.

2.2 Installing License PAKs

With the purchase of SLM are License PAKs that permit the execution of SLM on a particular machine. Before installing SLM these License PAKs must be registered in the License Management Facility (LMF).

One PAK will be shipped for SLM and additional PAKs for each purchased device support module. Each device support PAK has a product name that describes the type of module. For example, the PAK with the product name SLM-EXB120-CMD refers to the device support module for the Exabyte EXB-120 connected to a CMD Jukebox controller.

SLM supplies many device support modules during installation. This does not mean that all device support modules are licensed for this node. Only the device support modules that have valid PAKs are permitted to be used.

It is recommended that the PAKs be kept in a safe place for future reference. These do not constitute proof of ownership but will be needed in the even your license database is ever lost or corrupted.

Example 2-1 shows a typical registration of SLM and one device support PAK.

Installation and Setup

Example 2-1 Sample VMSLICENSE session

```
Welcome to VAX/VMS V5.4-2
Username: SYSTEM
Password:
Welcome to VAX/VMS version V5.4-2 on node DEMO
  Last interactive login on Friday, 14-JUN-1991 09:18
  Last non-interactive login on Thursday, 13-JUN-1991 09:06
$ SET DEF SYSSUPDATE
$ @VMSLICENSE

  VMS License Management Utility Options:

    1. Register a Product Authorization Key
    2. Amend an existing Product Authorization Key
    3. Cancel an existing Product Authorization Key
    4. List Product Authorization Keys
    5. Modify an existing Product Authorization Key

    9. Exit this procedure

  Type '?' at any prompt for a description of the information
  requested.

Enter one of the above choices [1]
Do you have your Product Authorization Key? [YES]

  The REGISTER option allows you add a new license to a license
  database. A Product Authorization Key (PAK) provides the product
  name and information you need to register the license. You must
  enter all the information provided by your PAK exactly as specified.

PAK ID:
          Issuer [DEC]CMD-TECH
          Authorization Number [ ]DDD-115-012

PRODUCT ID:
          Product Name [ ]SLM
          Producer [DEC]CMD-TECH

NUMBER OF UNITS:
          Number of Units [ ]0

KEY LEVEL:
          Version [ ]
          Product Release Date [ ]

KEY TERMINATION DATE:
          Key Termination Date [ ]

RATING:
          Availability Table Code [ ]F
          Activity Table Code [ ]

MISCELLANEOUS:
          Key Options [ ]MOD_UNITS
          Product Token [ ]
          Hardware-Id [ ]
          Checksum [ ]4-IKKD-JIEI-LMNF-LNBF
```

Example 2-1 Cont'd on next page

Example 2-1 (Cont.) Sample VMSLICENSE session

```

License Database File: SYSSCOMMON:[SYSEXE]LMF$LICENSE.LDB
      Issuer: CMD-TECH
      Authorization: DDD-115-012
      Producer: CMD-TECH
      Product Name: SLM
      Units: 0
      Date:
      Version:
Termination Date:
      Availability: F
      Activity:
      Options: MOD_UNITS
      Token:
      Hardware ID:
      Checksum: 4-IKKD-JIEI-LMNF-LNBF

Is this information correct? [YES]
Registering SLM license in SYSSCOMMON:[SYSEXE]LMF$LICENSE.LDB...
Do you want to LOAD this license on this system? [YES]
%LICENSE-I-LOADED, CMD-TECH SLM was successfully loaded with 0 units

VMS License Management Utility Options:

1. Register a Product Authorization Key
2. Amend an existing Product Authorization Key
3. Cancel an existing Product Authorization Key
4. List Product Authorization Keys
5. Modify an existing Product Authorization Key

9. Exit this procedure

Type '?' at any prompt for a description of the information
requested.

Enter one of the above choices [1]1
Do you have your Product Authorization Key? [YES]

The REGISTER option allows you add a new license to a license
database. A Product Authorization Key (PAK) provides the product
name and information you need to register the license. You must
enter all the information provided by your PAK exactly as specified.

PAK ID:
      Issuer [CMD-TECH]CMD-TECH
      Authorization Number [DDD-115-012]DD-115-113

PRODUCT ID:
      Product Name [SLM]SLM-EXB120-CMD
      Producer [CMD-TECH]

NUMBER OF UNITS:
      Number of Units [0]

KEY LEVEL:
      Version []
      Product Release Date []

KEY TERMINATION DATE:
      Key Termination Date []

RATING:
      Availability Table Code [F]
      Activity Table Code []

```

Example 2-1 Cont'd on next page

Installation and Setup

Example 2-1 (Cont.) Sample VMSLICENSE session

MISCELLANEOUS:

```
      Key Options [MOD_UNITS]
      Product Token []
      Hardware-Id []
      Checksum [4-IKGD-JIEI-LMNF-LNBF]4-IKDJ-EIJI-LBPN-LLNF

License Database File: SYSSCOMMON:[SYSEXE]LMP$LICENSE.LDB
      Issuer: CMD-TECH
      Authorization: DDD-115-013
      Producer: CMD-TECH
      Product Name: SLM-EXB120-CMD
      Units: 0
      Date:
      Version:
      Termination Date:
      Availability: F
      Activity:
      Options: MOD_UNITS
      Token:
      Hardware ID:
      Checksum: 4-IKDJ-EIJI-LBPN-LLNF
```

Is this information correct? [YES]

Registering SLM-EXB120-CMD license in SYSSCOMMON:[SYSEXE]LMP\$LICENSE.LDB...

Do you want to LOAD this license on this system? [YES]

%LICENSE-I-LOADED, CMD-TECH SLM-EXB120-CMD was successfully loaded with 0 units

VMS License Management Utility Options:

1. Register a Product Authorization Key
2. Amend an existing Product Authorization Key
3. Cancel an existing Product Authorization Key
4. List Product Authorization Keys
5. Modify an existing Product Authorization Key

9. Exit this procedure

Type '?' at any prompt for a description of the information requested.

Enter one of the above choices [1]9

```
$ LOGOUT
SYSTEM      logged out at 14-JUN-1991 16:00:31.51
```

2.3 Running VMSINSTAL

Run VMSINSTAL.COM from the SYSTEM account. The installation procedure takes approximately 15 minutes depending upon the media purchased. To begin, place the SLM distribution medium on the appropriate device. Next, log into the SYSTEM account and enter these commands:

```
$ SET DEF SYSSUPDATE
$ @VMSINSTAL SLMxxx device-name OPTIONS N
```

Here, *device-name* is the device on which the distribution medium is mounted.

Example 2-2 shows a typical installation.

Example 2-2 Sample VMSINSTAL session

```

$ set def sys$update
$ @vmsinstal slmu2013 scratch:[slm] options n

VAX/VMS Software Product Installation Procedure V5.4-2

It is 14-JUN-1991 at 09:20.
Enter a question mark (?) at any time for help.

%VMSINSTAL-W-ACTIVE, The following processes are still active:
DECW$WM_1
DECW$TE_1
_TWA2:
_TWA3:
_TWA4:
* Do you want to continue anyway [NO]? Y
* Are you satisfied with the backup of your system disk [YES]?

The following products will be processed:
    SLMU2 V1.3

Beginning installation of SLMU2 V1.3 at 09:20
%VMSINSTAL-I-RESTORE, Restoring product save set A ...

    Release notes included with this kit are always copied to SYSS$HELP.

    Additional Release Notes Options:

    1. Display release notes
    2. Print release notes
    3. Both 1 and 2
    4. None of the above

* Select option [2]: 2
* Do you want to continue the installation [NO]? yes
%VMSINSTAL-I-REMOVED, Product's release notes have been moved to SYSS$HELP.
*****
*
*           SCSI LIBRARY MANAGER           *
*           Installation of SLM version 1.3-2   *
*
*****
* Do you want to purge files replaced by this installation [YES]?

    Product:      SLM
    Producer:     CMD-TECH
    Version:      V1.0
    Release Date: 10-JUN-1991

* Does this product have an authorization key registered and loaded? YES
* Enter the device you want SLM to reside on [SYSS$COMMON]:
* Enter the directory do you want SLM to reside in [[SLM]]:
%VMSINSTAL-I-SYSDIR, This product creates system disk directory SYSS$COMMON:[SLM].
%CREATE-I-EXISTS, SYSS$COMMON:[SLM] already exists
* Do you wish to install the AUTOMOUNTER (requires V5.4 or above) [NO]? YES

```

Example 2-2 Cont'd on next page

Installation and Setup

Example 2-2 (Cont.) Sample VMSINSTAL session

Linking and providing the following JUKEBOX/CONTROLLER support libraries

```
Linking..... SLM_DEV_C1710A_CMD
Linking..... SLM_DEV_EXB120_CMD
Linking..... SLM_DEV_IDE_CMD
Linking..... SLM_DEV_NKK_CMD
Linking..... SLM_DEV_C1710A_GK
Linking..... SLM_DEV_EXB120_GK
Linking..... SLM_DEV_IDE_GK
Linking..... SLM_DEV_NKK_GK
```

Each of the supplied DEVICE SUPPORT MODULES is designed for specific Jukebox/Controller configurations. For Example:

An HP C1710A connected to a CMD CQD-2xx-MJ or CMD CBI-1000-MJ controller would require the SLM_DEV_C1710A_CMD support module.

For this configuration use the SLM CREATE or MODIFY commands specifying the /TYPE=SLM_DEV_C1710A_CMD qualifier.

```
*****
*
*                               *
*          SCSI LIBRARY MANAGER   *
*   Installation of SLM version 1.3-2 complete. *
*                               *
*****
```

SYSTEM MANAGER:

SLMSTARTUP.COM should be executed during every boot.
Add the following line to SYSS\$MANAGER:SYSTARTUP_V5.COM.

```
$ @SYSS$MANAGER:SLMSTARTUP.COM
```

SLMSETUP.COM should be executed during every login.
Add the following line to each user's SYSS\$LOGIN:LOGIN.COM
or to the system wide SYSS\$SYLOGIN.

```
$ @SYSS$MANAGER:SLMSETUP.COM
```

If SLM was NOT installed prior to this installation you will have to create and configure a database prior to use. To do this use the SLM utility to create a database and name and each of the disk devices within the jukebox. For example:

```
$ SLM CREATE/TYPE=SLM_DEV_C1710A_CMD/CONTROLLER=DUB3: -
  /TWO_SIDED/DRIVES=2/SLOTS=32
$ SLM NAME 1 /DEVICE=DUB4:
$ SLM NAME 2 /DEVICE=DUB5:
```

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
Installation of SLMU2 V1.3 completed at 09:22
```

VMSINSTAL procedure done at 09:22

```
$ logout
SYSTEM          logged out at 14-JUN-1991 09:22:50.63
```

3

Overview and Operation of SLM

This chapter describes how SLM operates and how to maintain and alter its configuration. SLM ships pre-configured for a standard environment that may not reflect your actual operating site and may need to be reconfigured.

SLM is composed of 4 parts:

- 1 User Interface (SLM Utility).
- 2 Callable interface for user-specific operation.
- 3 Jukebox support library (invoked at run-time).
- 4 Firmware support in hardware.

The user interface provides DCL commands to control and manipulate a jukebox. SLM provides a database function of maintaining volume names and volume status allowing a jukebox to be operational without requiring application development. It can be executed exactly like any VMS command or entered the same way as utilities like AUTHORIZE or INSTALL.

A callable interface has been provided to allow direct access to the jukebox for end-user specific applications that don't need or use the DCL and database features.

SLM has been designed to support a variety of jukeboxes by utilizing the run-time binding features of VMS. This provides a common user interface yet support for many different types of jukeboxes.

What makes SLM work is the cooperation of the device support library with the CMD Jukebox SCSI controller. This controller provides MSCP, TMSCP, and Jukebox access to a large variety of SCSI devices.

3.1

Startup

The startup script SYS\$MANAGER:SLMSTARTUP must be added to the startup procedure to provide the SLM operating environment:

```
$ @SYS$MANAGER:SLMSTARTUP
```

This command procedure is created during the installation to define the location of SLM for each re-boot of the VAX/VMS computer. This command will normally be added to the file SYS\$MANAGER:SYSTARTUP_V5.COM but can also be added to the SYSMAN startup environment as long as it is executed after the disk that SLM resides on has been mounted and made available.

3.2 User setup

The user interface portion of SLM is defined by executing:

```
$ @SYS$MANAGER:SLMSETUP
```

The SLMSETUP command execution should be added to each user's login.com that will need access to the SLM environment. If most users on the system will be using SLM then the SLMSETUP execution can be added to the file defined by SYS\$SYLOGIN, which is normally SYS\$MANAGER:SYLOGIN.COM.

3.3 Executing SLM

SLM can be executed in two different modes. The first kind is using SLM as a DCL Utility:

```
$ SLM
SLM> help
Information available:
ADD      BUILD_DCL  CREATE   DISMOUNT  EXIT
FLIP     HELP       INITIALIZE  LIST
MODIFY   MOUNT     NAME
SLM>
```

In this mode SLM provides the same features as any other utility such as line-editing and command recall. This mode is very useful when sequences of commands need to be executed interactively and only one part is being altered. This mode also reduces the number of image activations to 1 when multiple commands are being executed.

The alternative to the utility mode is the Command mode:

```
$ SLM HELP
Information available:
ADD      BUILD_DCL  CREATE   DISMOUNT  EXIT
FLIP     HELP       INITIALIZE  LIST
MODIFY   MOUNT     NAME
$
```

In this mode SLM provides the ability to use SLM in command procedures. This mode is very useful when automating tasks such as volume mounts or volume changes.

3.4 Populating the Jukebox

Usually the first step in working with a jukebox is getting the cartridges loaded into the vault (storage area). This act is called **ADDING** a cartridge and the SLM command **ADD** is used to accomplish this task.

ADD takes two parameters:

- 1 label name of the top side
- 2 label name of the bottom side

It is recommended that the labels be the same as the **VMS VOLUME** label on each side of the cartridge. Here is an example of adding a blank cartridge and initializing it with new volume names:

Examples

```
$ SLM ADD ALPHA BETA
```

Add a disk to the data vault

```
$ SLM MOUNT DUA1: ALPHA
```

move cartridge into drive DUA1:

```
$ INIT DUA1: ALPHA /SYSTEM
```

Create a FILES-11 file structure on volume

```
$ MOUNT/FOR DUA1:
```

Some jukeboxes don't spindown the drive so mount it and then

```
$ DISMOUNT/UNLOAD DUA1:
```

dismount it using the /UNLOAD qualifier

```
$ SLM FLIP/DRIVE/KEEP DUA1:
```

Flip the cartridge in the drive and keep the labels in the database correct.

```
$ INIT DUA1: BETA /SYSTEM
```

Create a FILES-11 file structure on volume on the B side

```
$ MOUNT/FOR DUA1:
```

Some jukeboxes don't spindown the drive so mount it and then

```
$ DISMOUNT/UNLOAD DUA1:
```

dismount it using the /UNLOAD qualifier

```
$ SLM DISMOUNT DUA1:
```

Store cartridge back in a free slot in the vault.

In this example we added the cartridge with the volume names of ALPHA and BETA even though the actual labels didn't reflect the name. This was done to simplify the selection of the cartridge for doing the actual initialization.

3.5 Evacuating the jukebox

The previous section demonstrated how to populate, fill, a jukebox with cartridges. It also displayed other features such as MOUNT, FLIP, and DISMOUNT. More information about these commands can be found in the Command Reference section of this manual.

Evacuation is very similar to adding except works in the reverse direction. Here is an example of removing slots by label name:

```
$ SLM REMOVE ALPHA
```

Overview and Operation of SLM

If duplicate label names exist within the jukebox a specific cartridge can be removed by specifying the slot number:

```
$ SLM REMOVE/SLOT=5
```

REMOVE has an **/OVERRIDE** qualifier which prevents SLM from validating the database prior to issuing the jukebox functions. This assists in removing volumes from a jukebox even though SLM's database is corrupt.

For more information on removing cartridges see the command **REMOVE** in the Command Reference section.

4

Overview and Operation of SLA

This chapter describes how the SCSI Library Automounter (SLA) operates and how to maintain and alter its configuration. SLA ships pre-configured for a standard environment and should be operational as shipped.

SLA is a set of programs which tracks OPCOM messages for Mount requests and acts upon them automatically, thus eliminating most manual execution of SLM commands.

4.1 Startup

The startup script for SLA is SYSS\$MANAGER:SLASTARTUP.COM. This command procedure is created during the installation and should be added to the SYSS\$MANAGER:SYSTARTUP_V5.COM file but can also be added to the SYSMAN startup environment as long as it is executed after the disk that contains SLM resides on has been mounted and made available.

4.2 Operational Description

SLA Monitor starts by creating a pseudo terminal using the VMS V5.4 PTD routines. This provides the Monitor with a input stream that looks like a terminal. A call to \$SENDOPR is then made to enable this pseudo terminal for receiving DISK and TAPE OPCOM messages.

A mailbox is then created to communicate with a sub-process. This sub-process will receive all DISK and TAPE opcom messages and decide what work needs to be done. The sub-process executes the command procedure SLM_HOME:AUTOMOUNTER.COM which executes all SLM commands to accomplish a VMS MOUNT request.

4.3 Message Flow

Example

The following example shows how SLA works in conjunction with OPCOM and SLM. It is assumed that the requested volume is FILES-11 labeled AR0001 and was added to the jukebox with the same name and that the drive DUA1: is empty.

```
$ MOUNT/ASSIST DUA1: AR0001
```

User or system manager tries to mount the disk, even though it isn't in the drive. But it is in the jukebox vault.

Overview and Operation of SLA

OPCOM issues *Please mount volume AR0001 in device DUA1:*

VMS notices that the drive is empty and requests help from OPCOM

LIBRARY_MONITOR reads *Please mount volume AR0001 in device DUA1: from FTA12:*

The pseudo terminal was enabled for DISK and TAPE
OPCOM messages when LIBRARY_MONITOR was started by
SYS\$MANAGER:SLASTARTUP.COM.

LIBRARY_MONITOR writes *Please mount volume AR0001 in device DUA1: to MBAxxx:*

When LIBRARY_MONITOR started up it created a mailbox and then
created a sub-process where *in_msg* is assigned to.

\$ BIG_LOOP:

\$ READ IN_MSG OPMSG /END_OF_FILE=LEAVE/ERROR=LEAVE completes

The sub-process reads *Please mount volume AR0001 in device DUA1: from
MBA152: into variable opmsg. The channel in_msg was opened earlier
and assigned to MBAxxx:)*

\$ SLM BUILD_DCL_SYMBOLS

The sub-process then evaluates the current state of the database using
SLM_* symbols created by the BUILD_DCL_SYMBOLS. Eventually
determines that the drive is empty and AR0001 does exist within the
jukebox.

\$ SLM MOUNT DUA1: AR0001

It then executes the correct SLM command to load the volume into the
drive.

\$ GOTO BIG_LOOP

And returns to the READ for the next OPCOM message.

DUA1: spins up and reports ON-LINE

VMS notices a change in device status and completes the mount
automatically.

%MOUNT-I-RQSTDON, operator request canceled - mount completed successfully

Mount request was satisfied without any operator intervention.

4.4 SLA Logging

The LIBRARY_MONITOR that is started via SLASTARTUP.COM has two
log files that are created to assist in debugging any problems:

- 1 SLM_HOME:SLAMONITOR.LOG
- 2 SLM_HOME:SLAMONITOR.ERR

Overview and Operation of SLA

The sub-process that executes AUTOMOUNTER.COM has its output directed to SLM_HOME:AUTOMOUNTER.LOG.

PART II Command Reference

This section describes each command in detail. Each command description includes a short statement of the command function, the complete command syntax, a description of each parameter (including its possible values and defaults), and an example. You can abbreviate command keywords to the smallest number of characters that keep it unique.

ADD

ADD imports a new cartridge into the storage section of a jukebox. Add will automatically locate the first free slot and import the cartridge.

FORMAT *ADD label-side-a label-side-b*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>first open slot</i>
<i>/INLET=number</i>	<i>/INLET=1</i>

restrictions *None.*

PARAMETERS *label-side-a*
Specifies the label information located on side A of the cartridge.

label-side-b
Specifies the label information located on side B of the cartridge.

COMMAND QUALIFIERS */SLOT=number*
overrides the default operation of locating free storage. ADD will verify that the slot is in fact empty prior to allowing the addition to the specified slot.

/INLET=number
informs ADD which inlet to use for the operation. /INLET defaults to a value of 1, thus using the default inlet.

EXAMPLES

```
$ SLM ADD USER-A USER-B
$ SLM ADD/SLOT=6 ALPHA BETA
$ SLM ADD/SLOT=55/INLET=2 ALPHA BETA
```

Command Reference

BUILD_DCL_SYMBOLS

BUILD_DCL_SYMBOLS

BUILD creates DCL symbols that reflect the current state of the SLM database.

FORMAT

BUILD

Command Qualifiers

none

Defaults

none

restrictions

None.

EXAMPLES

```
$ SLM BUILD_DCL_SYMBOLS
$ SHOW SYM SLM_*
SLM_CTRL == 'GKA0:
SLM_DRIVES == '1'
SLM_DRIVE_1_NAME == 'DKA0:
SLM_DRIVE_1_OCCUPIED == '0'
SLM_FREE_SLOTS == '7'
SLM_INLETS == '1'
SLM_SIDES == '2'
SLM_SLOTS == '9'
SLM_SLOT_1_A == 'ALPHA
SLM_SLOT_1_B == 'BETA
SLM_SLOT_1_OCCUPIED == '1'
SLM_SLOT_2_A == 'GAMMA
SLM_SLOT_2_B == 'ZETA
SLM_SLOT_2_OCCUPIED == '1'
SLM_SLOT_3_OCCUPIED == '0'
SLM_SLOT_4_OCCUPIED == '0'
SLM_SLOT_5_OCCUPIED == '0'
SLM_SLOT_6_OCCUPIED == '0'
SLM_SLOT_7_OCCUPIED == '0'
SLM_SLOT_8_OCCUPIED == '0'
SLM_SLOT_9_OCCUPIED == '0'
SLM_TYPE == 'SLM_DEV_IDE_GK
```

CLEAR

Clear initializes a slot to the default value. The database is updated but no jukebox operation is attempted. This provides the ability to define or adjust the state of a jukebox database.

FORMAT

CLEAR

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>

restrictions

None.

COMMAND QUALIFIERS

/SLOT=number
Provides SLM with the slot that is to be cleared.

EXAMPLES

\$ SLM CLEAR/SLOT=54
\$ SLM CLEAR/SLOT=6

Command Reference

CREATE

CREATE

Create a new Jukebox database. This function should only be executed once for each Jukebox on a system. CREATE will create a new database named SLM_DATABASE. SLM_DATABASE is normally a logical name defined as SLM_ROOT:SLM_DATABASE.DAT.

FORMAT

CREATE

Command Qualifiers	Defaults
<i>/TYPE=jukebox-type</i>	<i>none</i>
<i>/CONTROLLER=device-name</i>	<i>none</i>
<i>/SLOTS=number</i>	<i>none</i>
<i>[/NO]TWO_SIDED</i>	<i>/TWO_SIDED</i>
<i>/DRIVES=number</i>	<i>none</i>
<i>/INLETS=number</i>	<i>/INLETS=1</i>

restrictions

None.

PARAMETERS

none

COMMAND QUALIFIERS

/TYPE=jukebox-type

specifies what type of jukebox configuration is begin used. This value will be used to map in the device specific image for support of this jukebox. The value of this parameter is unique for each controller/jukebox configuration and must be specified.

/CONTROLLER=device-name

specifies what device to use for sending commands to the jukebox. The value of this parameter is unique for each controller/jukebox configuration and must be specified.

/SLOTS=number

specifies how may storage slots exist within the jukebox to be created. This qualifier must be specified.

[/NO]TWO_SIDED

qualifier makes the jukebox database to maintain volume label information for each side of the media. The default is */TWO_SIDED*.

/DRIVES=number

specifies how many disk drives are located in this jukebox. The default value is 1.

/INLETS=number

specifies how many inlets are located on this jukebox. The default value is 1.

EXAMPLES

```
$ SLM CREATE /TYPE=SLM_DEV_C1710A_CMD /CONT= DUA4: /SLOTS=32  
$ SLM CREATE /TYPE=SLM_DEV_EXB120_CMD /CONT= DUC1: /SLOTS=116/NOTWO_SIDED
```

Command Reference

DISMOUNT

DISMOUNT

DISMOUNT moves a cartridge from a specific drive back to storage.

FORMAT **DISMOUNT** *drive-name*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>first open slot</i>
<i>/[NO]VAULT</i>	<i>/VAULT</i>
<i>/INLET=number</i>	<i>/INLET=1</i>
<i>/FLIP</i>	<i>none</i>

restrictions *None.*

PARAMETERS *drive-name*
must be a valid VMS device name and must also match a device created using the NAME commands. See NAME for more info.

COMMAND QUALIFIERS */SLOT=number*
overrides the default operation of locating a free slot in storage. DISMOUNT will verify that the slot is in fact free prior to allowing its dismounting.

/INLET=number
informs DISMOUNT which inlet to use for the operation. /INLET defaults to a value of 1. /INLET can only be used with /NOVAULT.

/[NO]VAULT
informs DISMOUNT to use the storage area of the jukebox to store a cartridge. /NOVAULT allows for direct export from the specified drive. /NOVAULT cannot be used with /SLOT.

/FLIP
informs DISMOUNT to flip the cartridge upon storage into the vault. This qualifier is helpful for jukeboxes that remember original slot/orientation.

EXAMPLES

```
$ SLM DISMOUNT DKA400:
$ SLM DISMOUNT MKA500: /NOVAULT/INLET=15
```

EXIT

The EXIT command terminates SLM and returns the user to command language level.

FORMAT

EXIT

restrictions

None.

EXAMPLES

```
$ SLM  
SLM> EXIT  
$
```

Command Reference

FLIP

FLIP

FLIP flips a cartridge within a specific slot or drive. This may be needed if a cartridge was inserted up side down.

FORMAT

FLIP

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>
<i>/DRIVE=drive-name</i>	<i>none</i>
<i>[/NO]KEEP_LABELS</i>	<i>/KEEP_LABELS</i>

restrictions

None.

PARAMETERS

none

COMMAND QUALIFIERS

/SLOT=number

flips a specific slot number. Number must be a valid slot number within the jukebox.

/DRIVE=drive-name

flips a specific drive name. drive-name must be a valid drive name within the jukebox database and must be a valid VMS device.

[/NO]KEEP_LABELS

allows flipping of a cartridge and allowing the database to track the volume label change. This allows the re-organization of a jukebox database for positional optimization. The default is to track labels with the rotation of the volume.

EXAMPLES

```
$ SLM FLIP/SLOT=8
$ SLM FLIP/DRIVE=DKA500:
```

HELP

Lists and explains the SLM commands and qualifiers.

FORMAT **HELP** [*help-item* [*additional-info*]]

restrictions *None.*

PARAMETERS *help-item*
Request help on a specific topic like ADD or CREATE.

additional-info
Reduce search list by supplying additional information like a parameter or qualifier.

EXAMPLES

```
$ SLM
SLM> HELP
```

```
Information available:
```

```
ADD          BUILD_DCL CLEAR      CREATE   DISMOUNT  EXIT      FLIP
HELP         INITIALIZE LIST    MODIFY   NAME      RELABEL   REMOVE
SET
```

```
Topic? HELP
```

```
Lists and explains the SLM commands and qualifiers.
```

```
Format:
```

```
SLM> HELP [command-name]
```

```
Additional information available:
```

```
Parameter Qualifier
```

```
HELP Subtopic?
```

Command Reference

INITIALIZE

INITIALIZE

INITIALIZE provides a mechanism to update the jukebox database to reflect a cartridge's actual label.

FORMAT **INITIALIZE** *drive-name label*

restrictions *None.*

PARAMETERS *drive-name*
is the name of the device being initialized. This must be specified. drive-name must be a valid VMS device and be NAMED the same within the jukebox database. See NAME for more info.

label
is the new label of the volume currently mounted in the drive. This value must be specified.

COMMAND *none*

QUALIFIERS

EXAMPLES

```
$ SLM MOUNT DKA400: SCRATCH_DISK
$ INIT DK400: USER_ARCHIVE /SYSTEM
$ SLM INIT DKA400: USER_ARCHIVE
$ MOUNT DKA400/SYSTEM USER_ARCHIVE
$
```

LIST

Lists the information contained in the jukebox database.

FORMAT **LIST** *slot-number*

Command Qualifiers	Defaults
<i>/[NO]ALL</i>	<i>/NOALL</i>
<i>/[NO]CONFIG</i>	<i>/NOCONFIG</i>

restrictions *None.*

PARAMETERS *slot-number*
lists a specific slot. slot-number must be a number.

COMMAND QUALIFIERS */[NO]ALL*
lists all drive and slot information. The default is to only list slots and drives that are occupied.

/[NO]CONFIG
lists all the jukebox specific information. The default is not to print configuration information out.

EXAMPLES

```
$ SLM LIST/CONF
                SCSI LIBRARY MANAGER
                VERSION 1.3-2
TYPE:  SLM_DEV_C1710A_GK      CTRL:  GKA0:
SLOTS: 0032      INLETS: 0001  DRIVES: 0001      SIDES: 0002
SLOT 00000001      /ALPHA      / /BETA      /
SLOT 00000002      /GAMMA      / /ZETA      /
$
```

Command Reference

MODIFY

MODIFY

Modify a new Jukebox database. This function allows certain parameters of a jukebox to be altered.

FORMAT

MODIFY

Command Qualifiers	Defaults
<i>/TYPE=jukebox-type</i>	<i>none</i>
<i>/CONTROLLER=device-name</i>	<i>none</i>

restrictions

None.

COMMAND QUALIFIERS

/TYPE=jukebox-type

specifies what type of jukebox configuration is begin used. This value will be used to map in the device specific image for support of this jukebox. The value of this parameter is unique for each controller/jukebox configuration and must be specified.

/CONTROLLER=device-name

specifies what device to use for sending commands to the jukebox. The value of this parameter is unique for each controller/jukebox configuration and must be specified.

EXAMPLES

```
$ SLM MODIFY /TYPE=SLM_DEV_EXB120_CMD /CONTROLLER=DUB4:
```

MOUNT

MOUNT moves a cartridge from storage into a specific drive.

FORMAT **MOUNT** *device-name label*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>
<i>/SIDE=A B</i>	<i>/SIDE=A</i>
<i>/INLET=number</i>	<i>/INLET=1</i>
<i>[/NO]VAULT</i>	<i>/VAULT</i>

restrictions *None.*

PARAMETERS ***device-name***
must be a valid VMS device name and must also match a device created using the NAME commands. See NAME for more info.

label
specifies the label information located on the cartridge. This value must match the volume label located on one of the sides of cartridge being mounted. SLM will check both sides for the specified label and if it is found will request its mounting on the specific drive.

COMMAND QUALIFIERS ***/SLOT=number***
overrides the default operation of locating the label of the cartridge in storage. MOUNT will verify that the slot is in fact occupied prior to allowing its mounting.

/SIDE=A | B
provides for specifying which side is to be mounted when the /SLOT qualifier is used. /SIDE=A is the default.

/INLET=number
informs MOUNT which inlet to use for the operation. /INLET defaults to a value of 1. /INLET can only be used with /NOVAULT.

[/NO]VAULT
informs MOUNT to use the storage area of the jukebox to locate a cartridge. /NOVAULT allows for direct import to the specified drive. /NOVAULT cannot be used with /SIDE or /SLOT. The label is allowed for the loading side only.

Command Reference

MOUNT

EXAMPLES

```
$ SLM MOUNT DKA400: USER_ARCHIVE  
$ SLM  
SLM> MOUNT MKA500: ALPHA /NOVAULT  
SLM> EXIT  
$
```

NAME

Name defines a disk drives actual VMS DEVICE NAME. This is to allow for a exact match between the drive that is located within a jukebox and the VMS device name. This command only needs to be executed once for each drive in a jukebox.

FORMAT **NAME** *drive-number*

Command Qualifiers	Defaults
<i>/DEVICE=device-name</i>	<i>none</i>

PARAMETERS *drive-number*
is the drive-number index within the jukebox. This number is vendor specific and is supplied within the vendor specific documentation. This parameter must be specified.

COMMAND QUALIFIERS */DEVICE=device-name*
specifies what disk/tape controller is the actual drive. This qualifier is required.

EXAMPLES

```
$  
$ SLM NAME 1 /DEVICE=DKA400:  
$ SLM NAME 2 /DEVICE=DKA500:
```

Command Reference

QUIT

QUIT

The QUIT command terminates SLM and returns the user to command language level.

FORMAT

QUIT

restrictions

None.

EXAMPLES

```
$ SLM
SLM> QUIT
$
```

RELABEL

RELABEL provides a mechanism to update the jukebox database to reflect a cartridge's actual label. This is normally used when the wrong cartridge was inserted into the database or it was re-initialized by VMS.

FORMAT **RELABEL** *new-label*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>
<i>/SIDE=A B</i>	<i>/SIDE=A</i>

restrictions *None.*

PARAMETERS *new-label*
is the new label of the cartridge. This should be the same as the label on the current volume.

COMMAND QUALIFIERS */SLOT=number*
specifies which slot is to be affected. This qualifier must be supplied.

/SIDE=A|B
specifies which side of a cartridge to change the label. The default is */SIDE=A*.

EXAMPLES

```
$ SLM RELABEL IMAG01 /SLOT=5/SIDE=B
$ SLM RELABEL LABELA /SLOT=1
```

Command Reference

REMOVE

REMOVE

REMOVE exports an existing cartridge from the storage area of a jukebox. REMOVE will automatically locate the cartridge by label and request the export.

FORMAT REMOVE *label*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>
<i>/INLET=number</i>	<i>/INLET=1</i>
<i>/OVERRIDE</i>	<i>none</i>

PARAMETERS *label-side-a*

specifies the label information located on the cartridge. This value must match the volume label located on one of the sides of cartridge being exported. SLM will check both sides for the specified label and if it is found will request its export.

COMMAND QUALIFIERS

/SLOT=number

overrides the default operation of locating the label of the cartridge in storage. REMOVE will verify that the slot is in fact occupied prior to allowing the exportation.

/INLET=number

informs REMOVE which inlet to use for the operation. /INLET defaults to a value of 1, thus using the default inlet.

/OVERRIDE

Allows the user to override the database information and force a removal. This is useful when the database gets out of sync with the jukebox and thinks that the slot was empty. This qualifier requires /SLOT=number to be specified.

EXAMPLES

```
$ SLM REMOVE USER-A
$ SLM REMOVE/INLET=14 USER-B
$ SLM REMOVE/SLOT=55/OVERRIDE
```

SET

Set initializes a slot to a specified value. The database is updated but no jukebox operation is attempted. This provides the ability to define or adjust the state of a jukebox database.

FORMAT **SET** *label-side-a label-side-b*

Command Qualifiers	Defaults
<i>/SLOT=number</i>	<i>none</i>

restrictions *None.*

PARAMETERS *label-side-a*
Specifies the label information located on side A of the cartridge.

label-side-b
Specifies the label information located on side B of the cartridge.

COMMAND QUALIFIERS */SLOT=number*
Provides SLM with the slot that is to be set.

EXAMPLES

\$ SLM SET/SLOT=54 ALPHA BETA
\$ SLM SET/SLOT=6 GAMA ZETA

Command Reference

SHOW

SHOW

Shows the information contained in the jukebox database.

FORMAT **SHOW** *slot-number*

Command Qualifiers	Defaults
<i>/[NO]ALL</i>	<i>/NOALL</i>
<i>/[NO]CONFIG</i>	<i>/NOCONFIG</i>

restrictions *None.*

PARAMETERS *slot-number*
lists a specific slot. slot-number must be a number.

COMMAND QUALIFIERS */[NO]ALL*
lists all drive and slot information. The default is to only list slots and drives that are occupied.

/[NO]CONFIG
lists all the jukebox specific information. The default is not to print configuration information out.

EXAMPLES

```
$ SLM SHOW/CONF
                SCSI LIBRARY MANAGER
                VERSION 1.3-2

TYPE:  SLM_DEV_C1710A_GK      CTRL:  GKA0:
SLOTS: 0032                   INLETS: 0001   DRIVES: 0001   SIDES: 0002

SLOT  00000001                /ALPHA                / /BETA                /
SLOT  00000002                /GAMMA                / /ZETA                /
$
```

PART III Language Reference

SLM provides a callable interface for programming languages to access a jukebox. This support bypasses all database functions provided by the SLM command utility. The callable interface allows application specific requirements to utilize the Jukebox controller with a variety of different jukeboxes without having to incur the overhead and restrictions of SLM.

This section defines the callable functions and the parameters required for each call. The procedures are intended to be called from user written programs to perform common jukebox operations.

The SLM library provides an object module with the defined entry points defined in the rest of this section. To utilize SLM within a program simply add calls to your program and then link to the module SLM_COMMON.

The library generates many SLM specific error codes that may be needed to the application. These error codes can be located in the module SLM\$MESSAGES.

```
$ LINK myprog,slm_home:slm_common,slm_home:slm$messages
```

SLM\$R_MAP_IMAGE—Map Image file

FORMAT **SLM\$R_MAP_IMAGE** *manufacture, controller*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS ***manufacture***
 VMS Usage: **char_string**
 type: **character string**
 access: **read only**
 mechanism: **by descriptor**
 Manufacture specifies the type of jukebox being invoked. This must be a logical name that points to the actual shareable library being invoked. For example SLM_DEV_EXB120_CMD is defined in SLMSTARTUP to be SLM_HOME:EXB120_CMD.EXE.

controller
 VMS Usage: **device_name**
 type: **character string**
 access: **read only**
 mechanism: **by descriptor**
 Controller specifies the device name to be used to communicating with the jukebox controller. This value is jukebox dependent but must contain a valid device name.

DESCRIPTION This routine run-time maps the device support shareable image file into the current program address space. This subroutine must be called once and called before any other SLM subroutine.

RETURN VALUES SSM\$NORMAL Indicates successful completion
 many any SSM\$_device error codes
 many any LIB\$FIND_IMAGE_SYMBOL error codes

SLM\$R_SCSI_DISMOUNT—Remove a cartridge from drive

FORMAT SLM\$R_SCSI_DISMOUNT *inlet, drive, slot, flip*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS

inlet

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Inlet specifies the inlet to use if the cartridge is not going to the vault.

drive

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Drive specifies the drive to remove the cartridge from. Drives are numbered beginning with 1 and incremented from there. The number of drives is jukebox dependent.

slot

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Slot specifies the slot to put the cartridge to. If slot is 0 then the inlet is used. Creating the capability for the /NOVAULT options. The number of slots is jukebox dependent.

flip

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

A value of 0 will use the current side, where a value of 1 will cause a flip while in motion.

DESCRIPTION

SLM\$R_SCSI_DISMOUNT moves a cartridge from a specified drive to a slot/inlet.

**RETURN
VALUES**

SS\$_NORMAL
many

Indicates successful completion
any SS\$_device error codes

SLM\$R_SCSI_FLIP—Flip a cartridge

FORMAT SLM\$R_SCSI_FLIP *slot, drive*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS *slot*
 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Slot specifies the slot to flip. Slot is only used if drive is 0. The number of slots is jukebox dependent.

drive
 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Drive specifies the drive to flip. If drive is zero then slot is used. Drives are numbered beginning with 1 and incremented from there. The number of drives is jukebox dependent.

DESCRIPTION SLM\$R_SCSI_FLIP flips the cartridge at a specified drive or slot.

RETURN VALUES SSM\$_NORMAL Indicates successful completion
 many any SSM\$_device error codes

SLM\$R_SCSI_LOAD—Load cartridge into jukebox

FORMAT **SLM\$R_SCSI_LOAD** *inlet, slot*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS *inlet*
 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Inlet specifies which inlet to use for the import operation. In most cases inlet will be a value of 1.

slot

 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Slot specifies which slot to place the new cartridge into. This value usually begins as 1 and ends at the highest slot number. The range for this value is dependent upon the manufacture/type of the jukebox being used.

DESCRIPTION SLM\$R_SCSI_LOAD imports a cartridge from the external world into the jukebox storage area.

RETURN VALUES SS\$_NORMAL Indicates successful completion
 many any SS\$_device error codes

SLM\$R_SCSI_LOCK—Lock the Jukebox

FORMAT SLM\$R_SCSI_LOCK

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

DESCRIPTION SLM\$R_SCSI_LOCK locks a jukebox from access to the external world.

RETURN
VALUES SS\$_NORMAL Indicates successful completion
 many any SS\$_device error codes
 many any SLM\$_error codes

SLM\$R_SCSI_MOUNT—Move a cartridge into a drive

FORMAT SLM\$R_SCSI_MOUNT *inlet, drive, slot, side*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS *inlet*
 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Inlet specifies the inlet to use if the cartridge is not coming from the vault.

drive

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Drive specifies the drive to mount the cartridge into. Drives are numbered beginning with 1 and incremented from there. The number of drives is jukebox dependent.

slot

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Slot specifies the slot to get a cartridge from. If slot is 0 then the inlet is used. Creating the capability for the /NOVAULT options. The number of slots is jukebox dependent.

side

VMS Usage: **longword_signed**
type: **longword (signed)**
access: **read only**
mechanism: **by value**

Side specifies which side is to be mounted. A value of 0 will use the current side, where a value of 1 will cause a flip while in motion.

DESCRIPTION SLM\$R_SCSI_MOUNT moves a cartridge from a slot/inlet to a specified drive.

Language Reference
SLM\$R_SCSI_MOUNT

**RETURN
VALUES**

SS\$_NORMAL
many

Indicates successful completion
any SS\$_device error codes

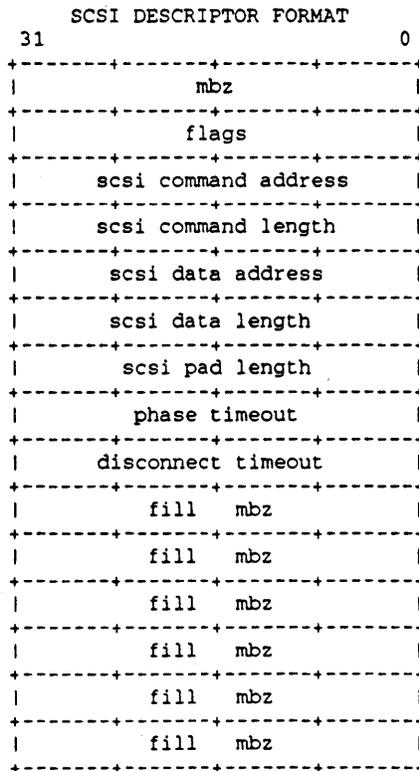
SLM\$R_SCSI_PASSTHRU—Pass SCSI command to Jukebox Device

This routine provides a mechanism to pass any SCSI command to the Jukebox Device. SLM\$R_SCSI_PASSTHRU is provided to allow other applications to gain access to JUKEBOX operations other than MOVE MEDIA.

FORMAT **SLM\$R_SCSI_PASSTHRU** *scsi-desc, scsi-iosb*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS ***scsi-desc***
 SCSI Descriptor defines the location and size of the SCSI command and DATA. It is passed by reference, address of this data block. SLM provides a C language definition for this structure. It is located at SLM_HOME.



Currently only 2 bits of the *flags* field are defined. For upward compatibility set the remaining 30 bits to zero.

SLM\$R_SCSI_UNLOAD—Unload a cartridge from a Jukebox

FORMAT **SLM\$R_SCSI_UNLOAD** *inlet, slot*

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

ARGUMENTS ***inlet***
 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Inlet specifies which inlet to use for the export operation. In most cases inlet will be a value of 1.

slot

 VMS Usage: **longword_signed**
 type: **longword (signed)**
 access: **read only**
 mechanism: **by value**
 Slot specifies which slot to export. This value usually begins as 1 and ends at the highest slot number. The range for this value is dependent upon the manufacture/type of the jukebox being used.

DESCRIPTION SLM\$R_SCSI_UNLOAD exports a cartridge from the jukebox storage area to the external world.

RETURN VALUES SS\$_NORMAL Indicates successful completion
 many any SS\$_device error codes

SLM\$R_SCSI_UNLOCK—Unlock the Jukebox

FORMAT SLM\$R_SCSI_UNLOCK

RETURNS VMS Usage: **cond_value**
 type: **longword (unsigned)**
 access: **write only**
 mechanism: **by value in r0**

DESCRIPTION SLM\$R_SCSI_UNLOCK unlocks a jukebox for access to the external world.

RETURN VALUES

SS\$_NORMAL	Indicates successful completion
many	any SS\$_device error codes
many	any SLM\$_error codes

A Controller Configurations

This appendix describes the specific information about each controller interface supported by SLM.

A.1 CMD TECHNOLOGY CQD and CBI Controllers

All CMD controllers that contain the letter *J* in the part number support SLM.

The disk controller creates a disk drive matching the Jukebox SCSI ID. This disk is not an actual disk drive but is the basis of communication to the jukebox. Do not attempt to use this device like any other disk as it has been specially designed to work with SLM.

For example, an HP C1710A jukebox with 2 disk drives and the C1710A SCSI ID set to 0 and the drive's IDs set to 1 and 2, will produce DUA0:, DUA1:, and DUA2:.

DUA0: is not an actual drive but the device that needs to be entered in the controller field of SLM:

```
$ SLM MODIFY/CONTROLLER=DUA0:
```

A.2 Generic SCSI Driver

The Generic SCSI Driver (GKDRIVER) is supplied with VMS for use on all VAX and VAXstations that have the integrated SCSI controller. To utilize the GK support modules supplied with SLM a GK device must be configured.

The SCSI device requires that the generic class driver be loaded, it must be configured by an explicit SYSGEN CONNECT command, as follows:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT GKpd00 /NOADAPTER
```

In this command, *GK* is the device mnemonic for the generic SCSI class driver; *p* represents the SCSI port ID (for instance, the controller ID *A* or *B*); and *d* represents the SCSI device ID (a digit from 0 to 7).

For example, to connect SCSI ID 2 on SCSI port A use:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT GKA200 /NOADAPTER
```

But for SCSI ID 0 do not specify all three zeros:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT GKA0 /NOADAPTER
```

Controller Configurations

After the device name has been determined inform SLM of the correct path:

```
$ SLM MODIFY/CONTROLLER=GKA100:
```

A.3 Serial Support

Even though SLM was designed around SCSI jukeboxes, it is generic enough to be applied to jukeboxes that only have Serial (RS232) communication capability.

To insure proper communication between VMS and the jukebox, please use the following settings on any serial port used to connect the device to the host:

```
$ set term/perm TTx /passall/noecho/form/tab/noeigh -  
/altypeahd/type/unknown/speed=9600/noautobaud
```

Specify the terminal device as the controller:

```
$ SLM MODIFY/CONTROLLER=TXA6:
```

B

Error Codes

This section defines all SLM error codes and provides some explanation of the problem to assist in error recovery.

SLM-W-SCSIINVALID, Invalid parameter send to SCSI shareable library

Facility: SLM, Scsi Library Manager

Explanation: A parameter passed to a routine as invalid.

User Action: If this error occurs while using the SLM utility please submit an SPR including as much information as possible. If using the callable routines validate parameter values and passing mechanism.

SLM-W-CTRLRINVALID, An invalid SCSI controller has been specified, check setup

Facility: SLM, Scsi Library Manager

Explanation: The controller specified in the SLM\$R_MAP_IMAGE is not valid.

User Action: Correct SLM database or parameter passed to SLM\$R_MAP_IMAGE.

SLM-W-QUALREQUIRED, Qualifier !AS is required for this command

Facility: SLM, Scsi Library Manager

Explanation: The specified qualifier is required for this command.

User Action: Add the qualifier and the value it may need.

SLM-W-NOTSUPPORTED, Option is not support in current version

Facility: SLM, Scsi Library Manager

Explanation: The command feature may not be supported by this jukebox.

User Action: If the device is capable this option please submit an SPR.

SLM-W-NOTAVAILABLE, Specified slot/drive is unavailable - already in use

Facility: SLM, Scsi Library Manager

Explanation: SLM instructed the jukebox to move a cartridge to a slot or drive that was already occupied.

User Action: If /SLOT=number was specified, choose a different location. This may also indicate an inconsistent database with the jukebox, verify and validate DB with jukebox inventory.

Error Codes

SLM-W-NOTOCCUPIED, Specified slot/drive is empty

Facility: SLM, Scsi Library Manager

Explanation: SLM instructed the jukebox to move a cartridge from a slot or drive that was empty.

User Action: If /SLOT=number was specified, choose the correct location. This may also indicate an inconsistent database with the jukebox, verify and validate DB with jukebox inventory.

SLM-W-NOMORESLOTS, Jukebox is full, no slot available

Facility: SLM, Scsi Library Manager

Explanation: The Database has reflected a full jukebox - no additional slots for the operation.

User Action: Remove a cartridge before adding the new one. This may also indicate an inconsistent database with the jukebox, verify and validate DB with jukebox inventory.

SLM-W-NODATABASE, Error opening jukebox database

Facility: SLM, Scsi Library Manager

Explanation: SLM could not locate the SLM_DATABASE file.

User Action: This usually indicates SYS\$MANAGER:SLMSTARTUP.COM was not executed. This can also occur when a database has not been created.

SLM-W-CORRUPT, Database is missing configuration info, DB corrupt

Facility: SLM, Scsi Library Manager

Explanation: The Database did not contain any configuration information about the jukebox. The database is corrupt.

User Action: Try to determine why the database was corrupted. The only recoverable mechanism is to create a new database.

SLM-W-NOTFOUND, Volume labeled !AS not found in jukebox

Facility: SLM, Scsi Library Manager

Explanation: The requested volume was not located in the jukebox.

User Action: Validate spelling with SLM LIST command output.

SLM-W-NOSUCHDRIVE, Drive !AS does not exist in jukebox

Facility: SLM, Scsi Library Manager

Explanation: The specified drive doesn't exist within the jukebox.

User Action: Validate spelling with SLM LIST/ALL command output.

SLM-W-NOSUCHSLOT, Slot !XL does not exist in jukebox

Facility: SLM, Scsi Library Manager

Explanation: A slot was specified out of range.

User Action: Validate slot range with SLM LIST/CONFIG.

SLM-W-DRIVEOCC, Drive !AS is currently occupied by another volume

Facility: SLM, Scsi Library Manager

Explanation: The drive requested in the SLM MOUNT command is already occupied.

User Action: Use the SLM DISMOUNT command to remove the current volume.

SLM-W-DRIVENOTOCC, Drive !AS is NOT currently occupied by volume

Facility: SLM, Scsi Library Manager

Explanation: The drive requested in the SLM DISMOUNT command is empty.

User Action: None. - Device is empty

SLM-W-OPABORTED, Operation abort due to hardware problems, DB not altered

Facility: SLM, Scsi Library Manager

Explanation: Some unrecoverable error occurred.

User Action: Record the CHECKSTATUS values signaled to the screen and submit an SPR with as much information as possible.

SLM-W-OCCUPIED, Destination slot/drive was occupied, DB updated, operation terminated

Facility: SLM, Scsi Library Manager

Explanation: The database thought a drive or slot was empty but was found to be occupied when SLM instructed the jukebox to do the operation.

User Action: This indicates an inconsistent database with the jukebox, verify and validate DB with jukebox inventory.

SLM-W-EMPTY, Source slot/drive was empty, DB updated, operation terminated

Facility: SLM, Scsi Library Manager

Explanation: The database thought a drive/slot was occupied, but was found to be empty when SLM instructed the jukebox to do the operation.

User Action: This indicates an inconsistent database with the jukebox, verify and validate DB with jukebox inventory.

Error Codes

SLM-W-FLIPFAILURE, Flip operation failed, DB not updated, check jukebox

Facility: SLM, Scsi Library Manager

Explanation: The flip command execution failed.

User Action: Determine any jukebox related problems.

SLM-W-EJECTFAILURE, Eject operation failed, DB not updated, check jukebox

Facility: SLM, Scsi Library Manager

Explanation: The eject command execution failed.

User Action: Determine any jukebox related problems.

SLM-W-EXPORTFAILURE, Export operation failed, DB not updated, check jukebox

Facility: SLM, Scsi Library Manager

Explanation: The export command execution failed.

User Action: Determine any jukebox related problems.

SLM-W-IMPORTFAILURE, Import operation failed, DB not updated, check jukebox

Facility: SLM, Scsi Library Manager

Explanation: The import command execution failed.

User Action: Determine any jukebox related problems.

SLM-W-SLOTREQUIRED, A slot number must be specified with /OVERRIDE

Facility: SLM, Scsi Library Manager

Explanation: A /SLOT=number was not specified with the /OVERRIDE qualifier.

User Action: If the OVERRIDE qualifier is used a slot number must be specified.

SLM-W-NOTLICENSED, Software is Not Licensed for this node

Facility: SLM, Scsi Library Manager

Explanation: The SLM utility is not licensed on this node.

User Action: Validate license installation for both SLM and the SLM device support module.

LICENSE-W-NOLICENSE, No license exists for this product

Facility: SLM, Scsi Library Manager

Explanation: The SLM utility is not licensed on this node.

User Action: Validate license installation for both SLM and the SLM device support module.

SLM-W-POWERRESET, Power-on or device reset

Facility: SLM, Scsi Library Manager

Explanation: The device issued a SCSI Check Condition with Power-on or device reset for more than 10 retries.

User Action: Check jukebox for proper operation.

SLM-W-JBRESERVED, Jukebox Controller is reserved by a SCSI device, operation aborted

Facility: SLM, Scsi Library Manager

Explanation: The jukebox SCSI controller was reserved by another host.

User Action: Validate configuration and insure no other HOST is communicating with the jukebox.

SLM-W-DBLERRHLT, Double error occurred while communicating with Jukebox, device inoperable

Facility: SLM, Scsi Library Manager

Explanation: It was impossible to get a good REQUEST SENSE from a CHECK CONDITION.

User Action: Validate configuration and contact technical support for additional assistance.

SLM-W-BADSENSE, Error reading Sense Data, jukebox inoperable

Facility: SLM, Scsi Library Manager

Explanation: It was impossible to get a good REQUEST SENSE from a CHECK CONDITION.

User Action: Validate configuration and contact technical support for additional assistance.

SLM-W-TRYFLIP, Try flipping the cartridge

Facility: SLM, Scsi Library Manager

Explanation: Try flipping the cartridge on eject.

User Action: This error code is for support of the NKK jukebox which remembers cartridge orientation and location.

SLM-I-CHECKSTATUS/JUKEBOX ERROR, Sense Key !XL, ASC !XL, ASCQ !XL>

Facility: SLM, Scsi Library Manager

Explanation: An unexpected error occurred.

User Action: Record Sense Key, ASC, and ASCQ information. Submit an SPR or contact technical support for assistance.

Index

A

ADD • SLM-3
 example of • 3-2, 3-3
AUTOMOUNTER
 definition • 4-1
 Operation • 4-1
 startup • 4-1

B

BUILD_DCL_SYMBOLS • SLM-4

C

CLEAR • SLM-5
Commands
 ADD • SLM-3
 BUILD_DCL_SYMBOLS • SLM-4
 CLEAR • SLM-5
 CREATE • SLM-6
 DISMOUNT • SLM-8
 EXIT • SLM-9
 FLIP • SLM-10
 HELP • SLM-11
 INITIALIZE • SLM-12
 LIST • SLM-13
 MODIFY • SLM-14
 MOUNT • SLM-15
 NAME • SLM-17
 QUIT • SLM-18
 RELABEL • SLM-19
 REMOVE • SLM-20
 SET • SLM-21
 SHOW • SLM-22
CREATE • SLM-6

D

DIRECTORY
 Location of SLM • 2-1

DISMOUNT • SLM-8
 example of • 3-3
DRIVES
 Definition of • 1-1

E

Error Codes • B-1 to B-5
EXIT • SLM-9

F

FLIP • SLM-10
 example of • 3-3

H

HELP • SLM-11

I

INITIALIZE • SLM-12
INLET
 Definition of • 1-1
INSTALLATION
 example • 2-5
 How to • 2-4
 License PAKs • 2-1

L

LIST • SLM-13
LMF
 License Management Facility
 Registering, example of • 2-1
Logfiles
 AUTOMOUNTER.LOG • 4-3
 SLAMONITOR.ERR • 4-2

Index

Logfiles (cont'd)

SLAMONITOR.LOG • 4-2

M

MODIFY • SLM-14

MOUNT • SLM-15

example of • 3-3

N

NAME • SLM-17

O

OPCOM • 4-1

Q

QUIT • SLM-18

R

RELABEL • SLM-19

REMOVE • SLM-20

example of • 3-3

Routine

SLM\$R_MAP_IMAGE • LR-3

SLM\$R_SCSI_DISMOUNT • LR-4

SLM\$R_SCSI_FLIP • LR-6

SLM\$R_SCSI_LOAD • LR-7

SLM\$R_SCSI_LOCK • LR-8

SLM\$R_SCSI_MOUNT • LR-9

SLM\$R_SCSI_PASSTHRU • LR-11

SLM\$R_SCSI_UNLOAD • LR-13

SLM\$R_SCSI_UNLOCK • LR-14

S

SET • SLM-21

SHOW • SLM-22

SLA

AUTOMOUNTER

SLMSETUP • 3-2

SLMSTARTUP • 3-1

SLOTS

Definition of • 1-1

V

VMSINSTAL

See INSTALLATION