

Magstar MP 3570 Tape Subsystem  
B-Series Models

IBM

# Maintenance Information



Magstar MP 3570 Tape Subsystem  
B-Series Models

IBM

# Maintenance Information

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page vii.

**Sixth Edition (October 1998)**

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## Preface

This manual is for use by service personnel who intend to install, remove, diagnose, repair, or test the IBM Magstar MP 3570 Tape Subsystem Models B01, B02, B11, B12, B21 and B22.

Part Number 05H9395

EC Number F23273

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## Magstar MP Publications

Additional information related to the subsystem is available in the following publications:

*IBM Magstar MP 3570 Tape Subsystem Introduction and Planning Guide, B-Series Models, GA32-0348*

*IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345*

*IBM Magstar MP 3570 Tape Subsystem Hardware Reference, B-Series Models, GA32-0365*

## AS/400 Information

For additional information about the AS/400 subsystems and software, see:

*AS/400 Physical Planning Reference SA41-3109 (IMPI)*

*AS/400 Physical Planning Reference SA41-5109 (RISC)*

*AS/400 Basic System Operation, Administration and Handling, SC41-5206*

*AS/400 Backup and Recovery SC41-5304*

*AS/400 CL Reference Guide SC41-5722*

*AS/400 System API Reference SC41-5801*

*Hierarchical Storage Management SC41-5351*

*Automated Tape Library Planning and Management Guide SC41-3309(IMPI)*

*Automated Tape Library Planning and Management Guide SC41-5309(RISC)*

*Backup Recovery and Media Services for AS/400, SC41-4345*

*A Practical Approach to Managing Backup Recovery and Media Services, SG24-4840*

## **RISC System/6000 Information**

For additional information about the RISC System/6000 subsystems and software, see:

*RISC System/6000 Getting Started: Using RISC System/6000*, GC23-2521

*RISC System/6000 Getting Started: Managing RISC System/6000*, GC23-2378

*RISC System/6000 V4 Problem Solving Guide*, SC23-2606

*RISC System/6000 V4 Message Guide & Reference*, SC23-2641

*RISC System/6000 Problem Solving Guide*, SC23-2204

*RISC System/6000 System Overview and Planning*, GC23-2406

*RISC System/6000 Planning for System Installation* GC23-2407

*7202 Install and Service Guide*, SA23-2670

*7015 Install and Service Guide*, SA23-2628

## **9076 SP2 Information**

*Scalable POWERparallel Systems: System Planning*, SC233864 PACKAGE on MKTTOOLS

*Scalable POWERparallel Systems: Installation Guide*, SH23-3865

*Scalable POWERparallel Systems: High-Performance Technical Computing Solutions*, GH23-2485

*Scalable POWERparallel Systems: Business Solutions*, GA23-2475

*IBM 9076 Scalable POWERparallel Systems: SP2 Administration Guide*, SH26-2486

*IBM 9076 Scalable POWERparallel Systems: SP2 Diagnosis and Messages*, SC23-3866

*IBM 9076 Scalable POWERparallel Systems: SP2 Command and Technical Reference*, SC23-3867

*IBM 9076 Scalable POWERparallel Systems: Maintenance Information, Vol. 1*, SY66-0294

*IBM 9076 Scalable POWERparallel Systems: Maintenance Information, Vol. 2*, SY66-0295

## **Device Driver Information**

*IBM SCSI tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154

## **Additional Information**

*Automated Tape Library Planning and Management*, SC41-3309

*Backup Recovery Guide—Basic*, SC41-3304

*Backup Recovery Guide—Advanced*, SC41-3305

*Backup Recovery and Media Service/400: Implementation Tips and Techniques*, GG24-4300

*Backup Recovery and Media Service/400*, SC41-3345

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# Start

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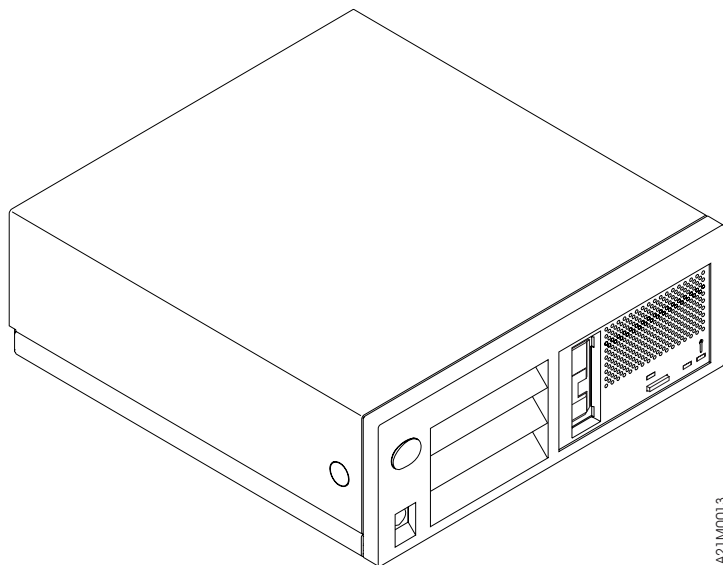
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# The IBM Magstar MP 3570 Tape Subsystem

## Drive—Only Models

The IBM Magstar MP 3570 Tape Subsystem drive-only model is pictured in Figure 1. When procedures in this manual are unique for this particular model, you will be referred to **drive- only** or **non-library** procedures.



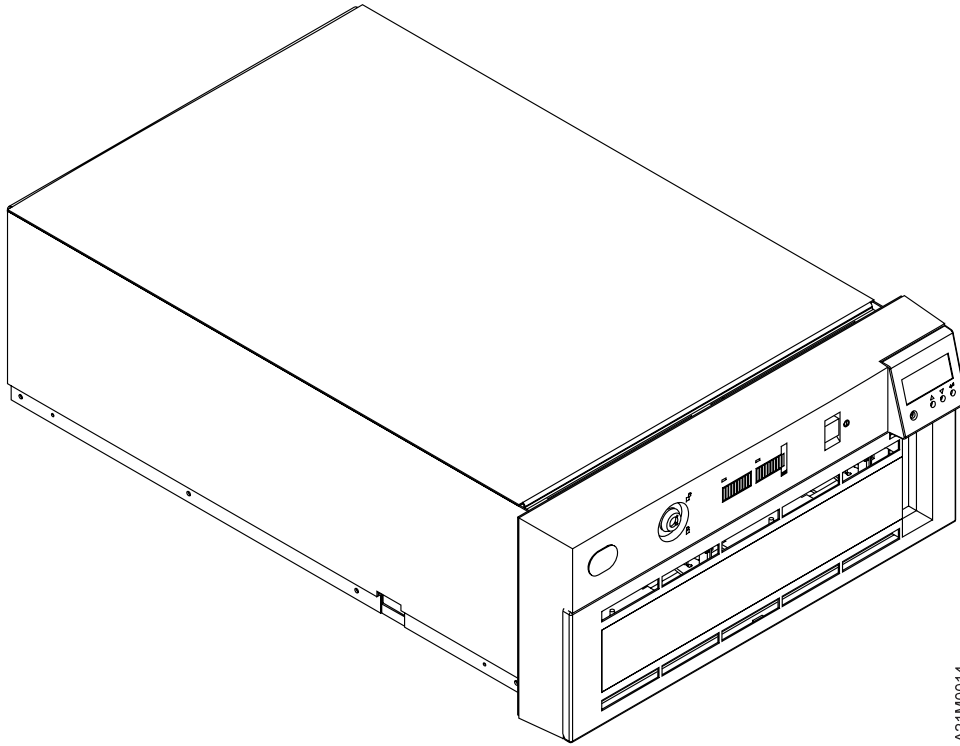
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Figure 1. Drive-Only Models

## Library Models

The IBM Magstar MP 3570 Tape Subsystem library model is pictured in Figure 2. When procedures in this manual are unique for library models, you will be referred to **library** procedures.

**Note:** In Models B02, B12 and B22 tape drive 1 is on the right and tape drive 2 is on the left, as you face the front of the library.



A21M0014

Figure 2. Library Models

## Maintenance Starting Point

Begin all maintenance action here.

Select the table below that best describes the 3570 model that you are here to work on. The two major model types are shown in Figure 1 on page START-2 and Figure 2 on page START-3. For 3570 **drives without a library**, see Figure 3. For 3570 **library models**, see Figure 4 on page START-6. If you cannot find the reason you are here in these two tables, see Figure 5 on page START-8 which has other entries into the Maintenance Information that are common to both the library and drive-only machines. Find the reason you are here in the left column of the appropriate table and perform the stated action in the right column.

### Notes:

1. Be sure that you are working on a 3570 Model Bxx drive. The Model Bxx drives have a **blue** UNLOAD button while the Model Cxx drives have a **green** UNLOAD button. If the UNLOAD button is green see *Magstar MP 3570 Tape Subsystem Maintenance Information C—Series Models*.
2. If the service call is on a status 3 machine, see “General Instructions” in the INSP section, then return here to continue the service call.

## Start Here For Drive-Only Models Without Library Attachments

<i>Figure 3 (Page 1 of 2). Start—For All Drive-Only Models Without Library Attachments</i>	
<b>If You Are Here For This Reason</b>	<b>Perform This Action</b>
Are you repairing a <b>library model</b> ?	Go to Figure 4 on page START-6.
FID message from the host.	Go to Figure 8 on page START-12 to fix the fault.
No FID message from the host, but the drive Maintenance, Busy, and Clean indicators are flashing in an attempt to pass on FID information.	Go to Figure 7 on page START-10.
ATTENTION DRIVE message in the host error log or displayed by LEDs.	Go to “Attention Drive Messages” on page START-24 for further isolation.
Some drive LEDs do light, but the drive Maintenance LED never cycles on and off at power on. Bring-up diagnostics are not running.	Go to “Other Obvious Symptom Problems: MAP” on page MAPS-21 to perform further problem determination.
Some LEDs fail to light on the front panel of the drive during power on or when the drive is in use. The drive cooling fan <b>is running</b> .	Go to “Drive LED Problems: MAP” on page MAPS-9 for further isolation.
No LED indicators light on the front panel of the drive during power on. The drive cooling fan <b>is not running</b> .	Go to “Power Problems: MAP” on page MAPS-13 for further isolation.
The drive hangs with all three LED indicators on solid. <b>Note:</b> The three LEDs will stay on momentarily during power on. If it hangs with this condition, the drive has a problem.	Go to “Other Obvious Symptom Problems: MAP” on page MAPS-21 to perform further problem determination.
You have no FID number and there are no indicators lighted to aid in isolation. Looks like power may be missing from some or all components.	Go to “Power Problems: MAP” on page MAPS-13 and perform further problem determination.



<i>Figure 3 (Page 2 of 2). Start—For All Drive-Only Models Without Library Attachments</i>	
<b>If You Are Here For This Reason</b>	<b>Perform This Action</b>
A host or channel detected problem. (No FID message)	<ol style="list-style-type: none"> <li>1. Run the Verify Fix diagnostics using a scratch cartridge to test the Read/Write function. See “Verify Fix—Drive-Only Models” on page PROC-9. If Verify Fix fails, use the FID to repair the drive.</li> <li>2. If you have a SCSI Wrap Tool available, perform “SCSI Port Wrap Test” on page PROC-84.</li> <li>3. Verify that the SCSI address is set correctly. See “Setting the SCSI Address—Drive-Only Model B00” on page INST-9.</li> </ol>
Were you not able to find the reason you are here?	Try the <b>Common</b> entry points Figure 5 on page START-8.

## Start Here For Library Models

**Note:** In Models B02, B12 and B22 tape drive 1 is on the right and tape drive 2 is on the left, as you face the front of the library.

<i>Figure 4 (Page 1 of 2). Start—All Library Models</i>	
<b>If You Are Here For This Reason</b>	<b>Perform This Action</b>
Are you repairing a <b>drive-only model without a library</b> ?	Go to Figure 3 on page START-4.
FID is displayed on the library operator panel display, in the Error/FID log, or in a host error log entry.	Go to Figure 8 on page START-12 to fix the fault.
ATTENTION DRIVE message on library operator panel display or in the error log.	Go to "Attention Drive Messages" on page START-24 for further isolation.
ATTENTION LIBRARY message on library operator panel display or in the error log.	Go to "Attention Library Messages" on page START-25 for further isolation.
RECOVER status on library operator panel display.	Go to "Clearing Tape Drive Recover Status" on page PROC-35.
Library operator panel display hangs with two dark lines across the display. The library LEDs may or may not be flashing.  <b>Note:</b> This is normal for the first 30 seconds during bring-up. If it hangs in this condition, the machine has a problem.	Go to "Other Obvious Symptom Problems: MAP" on page MAPS-21 to perform further problem determination.
Library operator panel display is blank or partial characters are indicated.	Go to "Library Operator Panel Problems: MAP" on page MAPS-3 for further isolation.
Some or all the LEDs fail to light on the front panel of a library machine.	Go to "Library LED Problems: MAP" on page MAPS-5 for further isolation.
You have no FID number and there are no indicators lighted. Looks like power is missing from some or all components.	Go to "Power Problems: MAP" on page MAPS-13 and perform further problem determination.
A host or channel detected problem. (No FID message)	<ol style="list-style-type: none"> <li>1. Run the Verify Fix diagnostics using a scratch cartridge to test the Read/Write function. See "CE Verify Fix on Library Models" on page PROC-13. If Verify Fix fails, use the FID to repair the drive.</li> <li>2. If you have a SCSI Wrap Tool available, perform "SCSI Port Wrap Test" on page PROC-84.</li> <li>3. Verify that the SCSI address is set correctly. See "Setting the SCSI Address and Configuring the Library" on page INST-46.</li> </ol>
You have a Model B02, B12 or B22 and the beginning of line three of the library operator panel display indicates an "N", or the library does not recognize that drive 2 is installed in the library.	Go to "Isolate Drive 1 or Drive 2 Communications Fault" on page PROC-43.
The tape drive status "INIT" is displayed on the operator panel for more than 5 minutes.	Go to "Isolate Drive 1 or Drive 2 Communications Fault" on page PROC-43.
The Bar Code Reader feature is installed and the host displays a message that states:  The cartridge cannot be found. The Volume ID does not match. Incorrect volume mounted in drive.	Go to "Resolving a Mismatch Between the Bar Code Label and VOLSER" on page PROC-33

<i>Figure 4 (Page 2 of 2). Start—All Library Models</i>	
<b>If You Are Here For This Reason</b>	<b>Perform This Action</b>
The bar code reader feature is installed and cannot read the label on a tape cartridge.	Go to “Resolving Bar Code Reader Problems” on page PROC-31.
The tape drive status indicates "CODE LVL" on the operator panel display.	<p>Tape drives 1 and 2 have different microcode levels installed. Update the microcode in the tape drives so that both drives have the same microcode installed. Select the appropriate update procedure below:</p> <ol style="list-style-type: none"> <li>1. See “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.</li> <li>2. See “Updating Microcode from an AS/400” on page PROC-58.</li> <li>3. See “Updating Microcode from RS/6000 by Using TAPEUTIL” on page PROC-59.</li> <li>4. See “Updating Microcode from a Sun System by Using TAPEUTIL” on page PROC-63.</li> <li>5. See “Updating Microcode from a HP—UX System by Using TAPEUTIL” on page PROC-65.</li> <li>6. See “Updating Microcode from a Windows NT System Using NTUTIL” on page PROC-68.</li> </ol>
Were you not able to find the reason you are here?	Try the <b>Common</b> entry points Figure 5 on page START-8.

## Start For Library & Drive-Only Common Entries

Figure 5 (Page 1 of 3). Start—Here for Common Entries Not Previously Listed

If You Are Here For This Reason	Perform This Action
<p>All three drive LED indicators are on solid or library LEDs flash continuously.</p> <p><b>Note:</b> This is normal for a few seconds at power on. If this condition continues, the machine has a problem.</p>	<p>Go to “Other Obvious Symptom Problems: MAP” on page MAPS-21 to perform further problem determination.</p>
<p>Removal of cartridge from loader by hand.</p>	<p>Go to “Removing Tape Cartridge from Drive” on page PROC-23.</p>
<p>Run verification tests.</p>	<p>Go to “Verify Fix” on page PROC-9.</p>
<ol style="list-style-type: none"> <li>1. Obtain 3570 drive error information at the host</li> <li>2. Obtain Service Information Message from a RS/6000.</li> <li>3. Obtain Service Information Message from an AS/400.</li> <li>4. Obtain Service Information Message from a Sun System.</li> <li>5. Obtain Error Information from a HP/UX System.</li> <li>6. Obtain Error Information from a Windows NT System.</li> <li>7. Review Service Information Messages in general.</li> </ol>	<ol style="list-style-type: none"> <li>1. See “Obtaining 3570 Drive Error Information at the Host” on page MSG-2.</li> <li>2. See “Error Log Analysis, RS/6000” on page MSG-3.</li> <li>3. See “Error Log Analysis, AS/400” on page MSG-23.</li> <li>4. See “Sun Error Logs” on page MSG-22.</li> <li>5. See “Obtaining Error Information from an HP/UX System” on page MSG-22.</li> <li>6. See “Obtaining Error Information from a Windows NT System” on page MSG-22.</li> <li>7. See “Service Information Messages (SIMs)” on page MSG-2.</li> </ol>
<p>Clean message from the host, the Clean indicator is on at the drive, or a Clean message is displayed on the library operator panel display.</p>	<p>See “Drive Head Cleaning Procedure” on page PROC-28 for the procedure to use to clean the drive head.</p>
<ol style="list-style-type: none"> <li>1. SCSI problems-AS/400 Environment.</li> <li>2. SCSI problems-AIX Environment.</li> <li>3. SCSI problems-Sun Environment.</li> <li>4. SCSI problems-HP/UX Environment</li> <li>5. SCSI problems-Window NT Environment.</li> <li>6. SCSI Port Wrap Test.</li> </ol>	<ol style="list-style-type: none"> <li>1. Go to “Checking the SCSI Attachment in an AS/400 Environment” on page PROC-73.</li> <li>2. Go to “Checking the SCSI Attachment in an AIX Environment” on page PROC-76.</li> <li>3. Go to “Checking the SCSI Attachment in a Sun Environment” on page PROC-80.</li> <li>4. Go to “Checking the SCSI Attachment in a HP-UX Environment” on page PROC-83</li> <li>5. Go to “Checking the SCSI Attachment in a Windows NT Environment” on page PROC-83</li> <li>6. Go to “SCSI Port Wrap Test” on page PROC-84.</li> </ol>

Figure 5 (Page 2 of 3). Start—Here for Common Entries Not Previously Listed

If You Are Here For This Reason	Perform This Action
<p>Tape damage symptoms</p> <ul style="list-style-type: none"> <li>Broken tape               <ul style="list-style-type: none"> <li>Outbound Reel-to-Reel motor missing tack pulses</li> <li>Failure of circuitry to detect tack pulses</li> </ul> </li> <li>Stretched tape               <ul style="list-style-type: none"> <li>Outbound Reel-to-Reel motor missing tack pulses</li> <li>Failure of circuitry to detect tack pulses</li> </ul> </li> <li>Folded over or wrinkled tape within cartridge               <ul style="list-style-type: none"> <li>Inbound Reel-to-Reel motor running away</li> <li>Failure of dynamic brake</li> </ul> </li> </ul>	<p>See “FID FE—Isolate Fault between Media and Hardware” on page PROC-98</p>
<p>Installation of a machine.</p>	<p>Refer to the INST section.</p>
<p>Remove or relocate a 3570 machine.</p>	<p>See “Removing a 3570” on page INST-70.</p>
<p>Inspect a machine.</p>	<p>See “General Instructions” on page INSP-2.</p>
<ol style="list-style-type: none"> <li>1. Microcode update-from FMR cartridge</li> <li>2. Microcode update-from AS/400</li> <li>3. Microcode update-from RS/6000 by using TAPEUTIL</li> <li>4. Microcode update-from Sun</li> <li>5. Microcode update-from HP/UX</li> <li>6. Microcode update-from Windows NT</li> </ol>	<ol style="list-style-type: none"> <li>1. See:           <ol style="list-style-type: none"> <li>a. “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.</li> <li>b. “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46.</li> </ol> </li> <li>2. See “Updating Microcode from an AS/400” on page PROC-58.</li> <li>3. See “Updating Microcode from RS/6000 by Using TAPEUTIL” on page PROC-59.</li> <li>4. See “Updating Microcode from a Sun System by Using TAPEUTIL” on page PROC-63.</li> <li>5. See “Updating Microcode from a HP—UX System by Using TAPEUTIL” on page PROC-65</li> <li>6. See “Offloading Dumps from 3570 to Windows NT System Using NTUTIL” on page PROC-69</li> </ol>
<p>Update FMR tape with latest microcode.</p>	<ol style="list-style-type: none"> <li>1. See “Making FMR Tape from Scratch Tape—Library Models” on page PROC-39.</li> <li>2. See “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46.</li> </ol>
<p>Making FMR tape from scratch tape.</p>	<ol style="list-style-type: none"> <li>1. See “Making FMR Tape from Scratch Tape—Library Models” on page PROC-39.</li> <li>2. See “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46.</li> </ol>
<p>Making scratch tape from FMR tape.</p>	<ol style="list-style-type: none"> <li>1. See “Making Scratch Tape from FMR Tape—Library Models (Unmaking FMR)” on page PROC-41.</li> <li>2. See “Making Scratch Tape from FMR Tape—Drive-Only Models (Unmaking FMR)” on page PROC-41.</li> </ol>

Figure 5 (Page 3 of 3). Start—Here for Common Entries Not Previously Listed

If You Are Here For This Reason	Perform This Action
<ol style="list-style-type: none"> <li>1. Perform a microcode dump to tape cartridge.</li> <li>2. Offloading dumps from 3570 attached to AS/400.</li> <li>3. Offloading dumps from 3570 to RS/6000.</li> <li>4. Offloading dumps from 3570 to a Sun System.</li> <li>5. Offloading dumps from 3570 to a HP/UX System.</li> <li>6. Offloading dumps from 3570 to a Windows NT System.</li> </ol>	<ol style="list-style-type: none"> <li>1. See:               <ol style="list-style-type: none"> <li>a. "Offloading Dumps from 3570 to Tape Cartridge (Library Models)" on page PROC-56.</li> <li>b. "Offloading Dumps from 3570 to Tape Cartridge (Drive-Only Models)" on page PROC-57.</li> </ol> </li> <li>2. See "Offloading Dumps from 3570 Attached to AS/400" on page PROC-58.</li> <li>3. See "Offloading Dumps from 3570 to RS/6000 by Using TAPEUTIL" on page PROC-61.</li> <li>4. See "Offloading Dumps from 3570 to a Sun System by Using TAPEUTIL" on page PROC-64.</li> <li>5. See "Offloading Dumps from 3570 to a HP—UX System by Using TAPEUTIL" on page PROC-66</li> <li>6. See "Offloading Dumps from 3570 to Windows NT System Using NTUTIL" on page PROC-69</li> </ol>
Microcode problem (FID E5).	See "FID E5—Microcode Problem" on page PROC-92.
You suspect a microcode problem, but no FID E5.	See "Suspected Microcode Problem" on page PROC-8.
Update or review microcode EC level history log.	See "Microcode EC Level History Log" on page PROC-47.
Repair a 3570 model without a FID number or ATTENTION message.	Go to "Other Obvious Symptom Problems: MAP" on page MAPS-21 to perform further problem determination.

## Drive Indicators-Normal Operation for Drive-Only Models

For drive-only models without a library attachment, three LEDs indicate operator messages and error conditions under normal customer operations. Figure 6 shows the location of the operator panel indicators. See "Drive Indicators and Operator Controls" on page INTRO-40 for a description of the indicators.

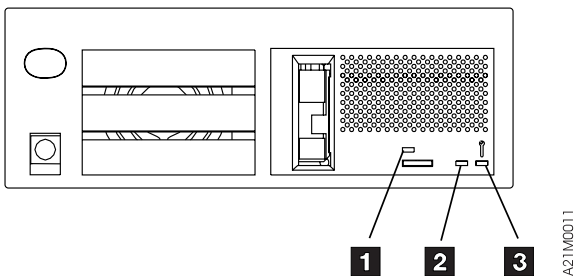


Figure 6. Drive Indicators for Drive-Only Models

Figure 7 shows the combination of the three indicators and their meanings under **normal customer operational conditions**. The Note column refers to an operator action or information.

For the meaning of these LEDs when in CE Mode, see Figure 254 on page PROC-12 for FID decode meanings and Figure 252 on page PROC-9 for meanings when displaying options.

Figure 7. Indicator Meaning During Normal Operational Conditions

Busy <sup>1</sup>	Clean <sup>2</sup>	Maintenance <sup>3</sup>	Note	Message
Off	Off	Off	—	Inactive
Off	Off	Flashing	1	POST or write/read diagnostic test running
Off	Flashing	Off	2	Cleaning is required
Off	On	Off	2	The drive has been disabled until the Head Cleaning procedure is performed.
On	Off	Off	3	Busy, tape in motion for write, read or locate
On	On	Off	—	ATTENTION DRIVE message is indicated. See “Attention Drive Messages” on page START-24.
On	On	On	4 & 5	On momentarily as a lamp test during power-on reset or during microcode recovery.
Flashing	Off	Off	3	Unloading, rewinding or cleaning
Flashing	Flashing	Flashing	5	A hard failure on drive
Off	Off	On	5	A hard failure on drive
Flashing	Flashing	On	5	A hard failure on drive

**Notes:**

1. Maintenance indicator flashing: a normal condition that occurs anytime diagnostics are running. The diagnostics run:
  - At power-on time.
  - After a system reset.
  - When a Send Diagnostic command is sent from the initiator.
  - When executed by the service representative.
 For more information on LED meanings in CE Mode, see Figure 252 on page PROC-9 and Figure 254 on page PROC-12.
2. Clean indicator flashing or ON solid: the 3570 determines that the read/write heads need cleaning. If the Clean indicator is ON solid, the 3570 drive will be disabled until the cleaning operation has been performed.
 

Load the cleaning cartridge into the 3570. See “Drive Head Cleaning Procedure” on page PROC-28. Cleaning is automatic: the Busy indicator is lighted and remains ON until the cleaning cartridge is unloaded. If the Clean indicator remains ON after cleaning or if the Clean indicator comes ON frequently, see “Other Obvious Symptom Problems: MAP” on page MAPS-21 for further isolation.
3. Busy indicator flashing or ON solid: a normal condition that indicates that the drive is executing either a read/write operation or is locating, rewinding, or unloading.
4. Busy, Clean and Maintenance indicators lighted: the LED test that occurs at power-on time, after a system reset or during microcode recovery.
5. Two major conditions may occur here:
  - a. All three indicators flash quickly, then the Maintenance LED stays ON solid while the other two LEDs flash or stay OFF. This indicates a hard failure on the drive and the drive is sending a coded message of the associated FID. For more information on LED meanings in CE Mode, see Figure 252 on page PROC-9 and Figure 254 on page PROC-12.
  - b. All three indicators flash quickly, then all three come ON solid for a time, then the three indicators flash quickly again. This pattern may repeat as many as four times. This indicates that the microcode has encountered problems, and is trying to recover. If the microcode fails to recover, it will then flash the three indicators continuously until the device is powered OFF or reset.

## FID Entry Point

Figure 8 lists each FRU identifier (**Reported FID**) and the field replaceable units (FRUs) to change, or problem areas to investigate under **FRU Name**. The figure (beginning with the Third Release) also contains the **Repair Sequence** you should follow in performing procedures or FRU replacements. Also included are **page Reference or Instruction** to the removal and replacement procedure for the FRU. Each FRU or problem is identified by name. The technical area code (**TAC**), provided here and in the CARR section, is to assist you with call reporting. The **Duration in hours** is intended to give you some idea of how long each FRU removal and replacement procedure will take. These numbers, along with the time it takes to remove and replace decorative covers (see times given for covers in the CARR section) should give you a ball park estimate of what time you can expect to spend replacing the parts. These times do not include diagnose and checkout time.

FIDs are displayed on the operator/CE panel in a FID message and in the error log. For example, if the message is FID1 90, **1** is the severity and **90** is the FID. "Intervention Screens" on page PANEL-9 describes the different types of messages and their impact on 3570 availability. The FID relates to the FRUs that have the highest probability of causing the problem. Only the reported FID is displayed on the panel and in the FID log. See Figure 8 for the complete list of FIDs and associated FRUs. Always replace the FRU or perform the recommended procedure in the order of **Repair Sequence** which takes into consideration failure probability.

If the FID has cable FRUs in the FRU list, reset the cable FRUs before replacing any FRU in the list.

If you are servicing a 3570 model that is **Rack** installed, two people are required to lift the device from the rack. Refer to "Installing the 3570 in a Rack" on page INST-20 for the procedure to use the hoist in cases where you are alone.

The service information message (SIM) record, which the 3570 sends to the host, also has the reported FID information. See "Service Information Messages (SIMs)" on page MSG-2.

Figure 8 (Page 1 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
00	The drive serial number is the default value				
	1	Invalid drive serial number	—	—	Enter valid drive serial number. Go to "Drive Serial Number—Library Models Only" on page PROC-36.
01	The drive logic card serial number is the default value				
	1	Invalid drive logic card serial number. This number is set when the card is built and cannot be changed in the field.	—	—	Replace the drive logic card. The procedure is at "FID EA: Drive Logic Card" on page CARR-16. If this does not resolve the problem, call for support.
03	Invalid setup detected				
	1	Configuration problem	—	—	Ensure the config/install options are correct (library models only).



Figure 8 (Page 2 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
90	Electronic fault. See also "Library Operator Panel Problems: MAP" on page MAPS-3.				
	1	Library operator panel display	50%	L05 (0.2)	CARR-36
	2	Library operator panel display cable	40%	C03 (0.1)	CARR-36
	3	Library control card	10%	T15 (0.2)	CARR-38
94	Bar code reader failure. Perform the procedure at "Resolving Bar Code Reader Problems" on page PROC-31 before replacing any of the following FRUs.				
	1	Bar code reader	70%	T18 (0.1)	CARR-37
	2	Library control card	20%	T15 (0.1)	CARR-38
	3	Picker assembly	3%	T12 (0.1)	CARR-40
	4	Picker cable	3%	C03 (0.1)	CARR-39
	5	Library interface cable	2%	C03 (0.1)	CARR-49
	6	Drive logic card	2%	L01 (0.5)	CARR-16
95	Did not detect accessor movement.				
	<ol style="list-style-type: none"> <li>1. Check for anything that might obstruct picker movement.</li> <li>2. Ensure that cartridges are positioned in the magazines properly. If the picker does not place the cartridges fully into the magazines, replace the picker assembly before replacing any other FRUs.</li> <li>3. This failure can also be caused by infrared light reflecting from the picker belts onto the Cartridge Present sensor. If the picker belts are shiny and you suspect this is the cause, clean the picker belts with alcohol on a lint-free cloth.</li> <li>4. If the above checks don't fix the problem, cycle the power off then on to the 3570 and observe the accessor assembly before replacing FRUs: <ol style="list-style-type: none"> <li>a. If the accessor motor assembly can move the picker back and forth, replace the accessor assembly before replacing any of the other FRUs.</li> <li>b. If accessor motor assembly cannot move the picker back and forth, replace the FRUs in the order listed below.</li> </ol> </li> </ol>				
	1	Accessor motor assembly	75%	T17 (0.2)	CARR-38
	2	Library control card	15%	T15 (0.1)	CARR-38
	3	Library sensor cable	5%	T04 (0.4)	CARR-50
4	Accessor assembly	5%	T14 (0.6)	CARR-37	
96	Timeout trying to extract a cartridge from a drive.				
	<ol style="list-style-type: none"> <li>1. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred. Look for physical defects. Have the customer replace the cartridge if it is damaged.</li> <li>2. A false 96 error can occur when the library door is opened when the library is attempting to put a cartridge away as part of the power-up sequence. If you believe this occurred, do not replace FRUs at this time.</li> <li>3. Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> <li>4. Ensure that the drive door is not binding or sticking.</li> </ol>				
	1	Loader assembly	30%	T45 (1.6)	CARR-28
	2	Picker assembly	20%	T12 (0.1)	CARR-40
	3	Picker cable	20%	C03 (0.1)	CARR-39
	4	Library control card	10%	T15 (0.1)	CARR-38
	5	Drive logic card, see Note 1 on page START-23.	8%	L01 (0.5)	CARR-16
	6	Loader home sensor	8%	T31 (0.1)	CARR-33
7	Library sensor cable	4%	T04 (0.4)	CARR-50	

Figure 8 (Page 3 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
97	Electronic-detected fault				
	1	Library control card	70%	T15 (0.1)	CARR-38
	2	Drive logic card	25%	L01 (0.5)	CARR-16
	3	Library interface cable	3%	C03 (0.1)	CARR-49
	4	Power supply	2%	P04 (0.1)	CARR-32
98	Load or unload error while moving cleaner cartridge between the library cleaner cartridge cell and the drive. Sensor did not change state. <b>Notes:</b> 1. Check the cleaner cartridge for physical damage. 2. Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Picker assembly	70%	T12 (0.1)	CARR-40
	2	Cleaner cartridge- present sensor	25%	T31 (0.1)	CARR-49
	3	Library control card	4%	T15 (0.1)	CARR-38
	4	Library sensor cable	1%	T04 (0.4)	CARR-50
9A	One of the sensors in the library did not change states. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Picker assembly	70%	T12 (0.1)	CARR-40
	2	Picker cable	20%	C03 (0.1)	CARR-39
	3	Library control card	7%	T15 (0.1)	CARR-38
	4	Library sensor cable	3%	T04 (0.4)	CARR-50
9B	Sensor in an invalid condition. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Drive global sensor pair	90%	T31 (0.2)	CARR-41
	2	Library control card	9%	T15 (0.1)	CARR-38
	3	Library sensor cable	1%	T04 (0.4)	CARR-50
9C	Sensor in an invalid condition. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Magazine global sensor pair	90%	T31 (0.2)	CARR-42
	2	Library control card	7%	T15 (0.1)	CARR-38
	3	Library sensor cable	3%	L01 (0.4)	CARR-50

Figure 8 (Page 4 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
9E	Sensor did not change state. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Priority cell cartridge-present sensor	90%	T31 (0.1)	CARR-48
	2	Library sensor cable	5%	L01 (0.4)	CARR-50
	3	Library control card	5%	T15 (0.1)	CARR-38
9F	Load or unload error when moving a cartridge between the drive and the library (a sensor did not change state). <ol style="list-style-type: none"><li>1. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred. Look for physical defects. Have the customer replace the cartridge if it is damaged.</li><li>2. A false 9F error can occur when the library door is opened when the library is attempting to put a cartridge away as part of the power-up sequence. If you believe this occurred, do not replace FRUs at this time.</li><li>3. Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li><li>4. Ensure that the drive door is not binding or sticking.</li></ol>				
	1	Picker assembly	30%	T12 (0.1)	CARR-40
	2	Loader assembly	20%	T45 (1.6)	CARR-28
	3	Picker cable	20%	C03 (0.1)	CARR-39
	4	Library control card	10%	T15 (0.1)	CARR-38
	5	Drive logic card, see Note 1 on page START-23.	8%	L01 (0.5)	CARR-16
	6	Loader home sensor	8%	T31 (0.1)	CARR-33
	7	Library sensor cable	4%	T04 (0.4)	CARR-50
A0	Sensor did not change state. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Magazine 2 sensor	90%	T31 (0.2)	CARR-48
	2	Library control card	7%	T15 (0.1)	CARR-38
	3	Library sensor cable	3%	T04 (0.4)	CARR-50
A1	Sensor did not change state. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Magazine 1 sensor	90%	T31 (0.1)	CARR-49
	2	Library control card	7%	T15 (0.1)	CARR-38
	3	Library sensor cable	3%	T04 (0.4)	CARR-50

Figure 8 (Page 5 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
A3	Sensor did not change state <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Cleaner cartridge- present sensor	90%	T31 (0.1)	CARR-49
	2	Library control card	7%	T15 (0.1)	CARR-38
	3	Library sensor cable	3%	T04 (0.4)	CARR-50
A7	Picker or priority slot error. <b>Notes:</b> 1. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred for physical defects. Have the customer replace the cartridge if it is damaged. 2. Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Library magazine	50%	Q05 (0.1)	Customer purchase item. Try another magazine before replacing any FRUs below.
	2	Picker assembly	40%	T12 (0.1)	CARR-40
	3	Picker cable	5%	C03 (0.1)	CARR-39
	4	Library control card	5%	T15 (0.1)	CARR-38
A8	Picker or magazine error. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred for physical defects. Have the customer replace the cartridge if it is damaged. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Library magazine	50%	Q05 (0.1)	Customer purchase item. Try another magazine before replacing any FRUs below.
	2	Picker assembly	40%	T12 (0.1)	CARR-40
	3	Picker cable	5%	C03 (0.1)	CARR-39
	4	Library control card	5%	T15 (0.1)	CARR-38
A9	Picker feed error. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred for physical defects. Have the customer replace the cartridge if it is damaged. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Library magazine	50%	Q05 (0.1)	Customer purchase item. Try another magazine before replacing any FRUs below.
	2	Picker assembly	40%	T12 (0.1)	CARR-40
	3	Picker cable	5%	C03 (0.1)	CARR-39
	4	Library control card	5%	T15 (0.1)	CARR-38

Figure 8 (Page 6 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
AA	Library door open sensor <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Library door open sensor	80%	T31 (0.2)	CARR-51
	2	Library control card	14%	T15 (0.1)	CARR-38
	3	Library sensor cable	6%	T04 (0.4)	CARR-50
B1	Drive LED fault detected				
	1	Drive LED card	81%	L05 (0.1)	CARR-31
	2	Drive logic card	10%	L01 (0.5)	CARR-16
	3	Drive sensor cable	9%	T04 (1.1)	CARR-29
B9	Cartridge is not fully seated in the loader. <b>Note:</b> This could be an operator problem in drive-only machines without a library. 1. Ensure that the cartridge is not damaged. 2. Ensure that the cartridge is a 3570 type cartridge.				
	1	Tape cartridge	40%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge before replacing the FRUs below.
	2	Loader assembly	35%	T45 (1.6)	CARR-28
	3	Picker assembly (For library only)	25%	T12 (0.1)	CARR-40
BA	Loader asm or servo card				
	1	Loader assembly	50%	T45 (1.6)	CARR-28
	2	Drive servo card	45%	T53 (1.0)	CARR-27
	3	Drive logic card	3%	L01 (0.5)	CARR-16
	4	Mother Board	2%	L02 (1.0)	CARR-28
BB	Loader asm, servo card, or tape cartridge. 1. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred for physical defects. Have the customer replace the cartridge if it is damaged. 2. Also ensure that the cartridge is a 3570 type cartridge.				
	1	Tape cartridge (check first)	20%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge before replacing the FRUs below.
	2	Loader assembly	50%	T45 (1.6)	CARR-28
	3	Drive servo card	30%	T53 (1.0)	CARR-27

Figure 8 (Page 7 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
BC	Load or unload failure. <b>Note: This FID can be caused by microcode. If the microcode level in this 3570 is at D114_22C or lower contact the next level of support before replacing any hardware.</b>				
	1. Before replacing any FRUs below, inspect the cartridge that was being used when the error occurred for physical defects. Have the customer replace the cartridge if it is damaged.				
	2. Ensure that the cartridge is a 3570 type cartridge.				
	3. Ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Tape cartridge (check first)	20%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge before replacing the FRUs below.
2	Loader assembly ( <b>See note</b> )	55%	T45 (1.6)	CARR-28	
3	Drive servo card	20%	T53 (1.0)	CARR-27	
4	Drive logic card	5%	L01 (0.5)	CARR-16	
BF	Thermal error. The tripped thermal is located on the drive logic card. Causes of a thermal trip can be overheating of the logic card circuits, a missing front drive bezel which is needed to deflect airflow to the drive logic card, a failing drive fan, or blockage of airflow in the fan area. If the cooling system appears to be adequate, replace the drive logic card.				
	1	Drive logic card	75%	L01 (0.5)	CARR-16
	2	Drive cooling fan	25%	A03 (0.3)	CARR-13
C1	Plus 5 or plus 12 volts not within specification. This FID is also reported when the drive detects a power outage. Before replacing FRU's power off then back on.				
	1	Power supply	90%	P04 (0.1)	CARR-32
	2	Drive servo card	10%	T53 (1.0)	CARR-27
C5	Tape cartridge or cartridge type sensor <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Tape cartridge (Check first)	90%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge.
	2	Cartridge type sensor, see Note 3 on page START-23.	6%	T31 (1.6)	CARR-28
	3	Drive servo card	4%	T53 (1.0)	CARR-27
CA	Sensor failed to change state <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Loader home sensor	55%	T31 (0.1)	CARR-33
	2	Drive servo card	41%	T53 (1.0)	CARR-27
	3	Drive sensor cable	9%	T04 (1.1)	CARR-29

Figure 8 (Page 8 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
CD	Sensor failed to change state <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	Drive logic card, see Note 1 on page START-23.	92%	T31 (0.5)	CARR-16
	2	Drive logic card, see Note 4 on page START-23.	8%	L01 (N/A)	CARR-16
D0	Read or write failure, servo error, or IPS calibration error.				
	1	Head-actuator assembly (D08=clean only, T22=replace)	80%	D08/ T22	PROC-28CARR-25
	2	Drive servo card	12%	T53 (1.0)	CARR-27
	3	Loader assembly	4%	T45 (1.6)	CARR-28
	4	Drive analog card	2%	T21 (0.6)	CARR-20
	5	Mother board	2%	L02 (1.0)	CARR-28
D1	Calibration error; possible interface problem between the head and the servo card				
	1	Head-actuator assembly (D08=clean only, T22=replace)	55%	D08/ T22 (0.8)	PROC-28CARR-25
	2	Drive servo card	40%	T53 (1.0)	CARR-27
	3	Drive logic card	5%	L01 (0.5)	CARR-16
D2	The head did not move. Head asm, servo card, analog card, or mother board				
	1	Head-actuator assembly (D08=clean only, T22=replace)	45%	D08/T22 (0.8)	PROC-28CARR-25
	2	Drive servo card	25%	T53 (1.0)	CARR-27
	3	Drive analog card	25%	T21 (0.6)	CARR-20
	4	Mother board	5%	L02 (1.0)	CARR-28
D3	Servo error while moving tape. Head asm (D08=clean only, T22=replace), cartridge, servo card, analog card, or mother board				
	1	Tape cartridge (check first)	45%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge before replacing the FRUs below.
	2	Head-actuator assembly, (D08=clean only, T22=replace)	20%	D08/ T22 (0.8)	PROC-28CARR-25
	3	Drive servo card	15%	T53 (1.0)	CARR-27
	4	Drive analog card	15%	T21 (0.6)	CARR-20
	5	Mother board	5%	L02 (1.0)	CARR-28
D8	Read/write error. (D08=clean only, T22=replace)				
	1	Drive servo card	54%	T53 (1.0)	CARR-27
	2	Head-actuator assembly, (D08=clean only, T22=replace)	36%	D08/ T22 (0.8)	PROC-28CARR-25
	3	Drive logic card	7%	L01 (0.5)	CARR-16
	4	Mother board	3%	L02 (1.0)	CARR-28

Figure 8 (Page 9 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
DD	Fault detected in loader sensors or the sensors are in an invalid combination. <b>Note:</b> Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	1	File protect, and cartridge type sensors. See Note 4 on page START-23.	37%	T45 (1.6)	CARR-28
	2	Loader home sensor	18%	T31 (0.1)	CARR-33
	3	Drive servo card	26%	T53 (1.0)	CARR-27
	4	Drive logic card, see Note 1 on page START-23.	15%	L01 (0.5)	CARR-16
	5	Drive logic card, see Note 4 on page START-23.	5%	L01 (N/A)	CARR-16
	6	Drive sensor cable	3%	T04 (1.1)	CARR-29
	7	Mother board	1%	L02 (1.0)	CARR-28
E0	Tape motion error				
	1	Tape cartridge (check first)	77%	D07 (0.1)	Customer item. Inspect for damage. Try another cartridge before replacing the FRUs below.
	2	Loader assembly	20%	T45 (1.6)	CARR-28
E4	Electronic-detected fault				
	1	Drive logic card	23%	L01 (0.5)	CARR-16
	2	Drive analog card	23%	T21 (0.6)	CARR-20
	3	Drive servo card	23%	T53 (1.0)	CARR-27
	4	Mother board	23%	L02 (1.0)	CARR-28
E5	Microcode detected a fault with the microcode				
	1	Microcode (known or unknown) (M01 = known, M02 = new)	100%	M01/ M02	PROC-92
E6	Timing problem in the microcode or the electronics, or multiple check-1 errors occurred				
	1	Microcode (known or new) (M01 = known, M02 = new)	50%	M01/M02	PROC-92 and PROC-94
	2	Drive logic card	20%	L01 (0.5)	CARR-16
	3	Drive analog card	15%	T21 (0.6)	CARR-20
	4	Drive servo card	10%	T53 (1.0)	CARR-27
E7	Timing problem in the microcode or the electronics				
	1	Microcode (known or new) (M01 = known, M02 = new)	50%	M01/ M02	PROC-92 and PROC-94
	2	Drive logic card	25%	L01 (0.5)	CARR-16
	3	Drive analog card	25%	T21 (0.6)	CARR-20



Figure 8 (Page 10 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
E8	Timing problem while writing and/or reading				
	1	Set a microcode trap based on the expert systems data, get a dump , and contact your next level of support.	—	—	PROC-53
EA	Electronic failure				
	1	Drive logic card	60%	L01 (0.5)	CARR-16
	2	Drive analog card	15%	T21 (0.6)	CARR-20
	3	Drive servo card	10%	T53 (1.0)	CARR-27
	4	Power supply	10%	P04 (0.1)	CARR-32
	5	Mother board	5%	L02 (1.0)	CARR-28
EB	Electronic failure				
	1	Drive analog card	60%	T21 (0.6)	CARR-20
	2	Drive servo card	15%	T53 (1.0)	CARR-27
	3	Drive logic card	10%	L01 (0.5)	CARR-16
	4	Power supply	10%	P04 (0.1)	CARR-32
	5	Mother board	5%	L02 (1.0)	CARR-28
EC	Electronic failure				
	1	Drive servo card	60%	T53 (1.0)	CARR-27
	2	Drive analog card	15%	T21 (0.6)	CARR-20
	3	Drive logic card	10%	L01 (0.5)	CARR-16
	4	Power supply	10%	P04 (0.1)	CARR-32
	5	Mother board	5%	L02 (1.0)	CARR-28
ED	Electronic failure				
	1	Drive logic card	55%	L01 (0.5)	CARR-16
	2	Drive analog card	35%	T21 (0.6)	CARR-20
	3	Mother board	10%	L02 (1.0)	CARR-28
EE	Electronic failure				
	1	Drive logic card	55%	L01 (0.5)	CARR-16
	2	Drive servo card	35%	T53 (1.0)	CARR-27
	3	Mother board	10%	L02 (1.0)	CARR-28
F0	Read error				
	1	Tape cartridge	60%	D07 (0.1)	Customer supply PROC-98
	2	Head-actuator assembly	15%	T22 (0.8)	CARR-25
	3	Drive analog card	10%	T21 (0.6)	CARR-20
	4	Drive logic card	5%	L01 (0.5)	CARR-16
	5	Drive sensor cable	5%	T04 (1.1)	CARR-29
	6	Mother board	5%	L02 (1.0)	CARR-28

Figure 8 (Page 11 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
F1	Read error				
	1	Tape cartridge	60%	D07 (0.1)	Customer supply PROC-98
	2	Head-actuator assembly	15%	T22 (0.8)	CARR-25
	3	Drive analog card	10%	T21 (0.6)	CARR-20
	4	Drive logic card	5%	L01 (0.5)	CARR-16
	5	Mother board	5%	L02 (1.0)	CARR-28
	6	Drive sensor cable	5%	T04 (1.1)	CARR-29
F2	Read-back check error.				
	1	Tape cartridge or hardware	60%	D07 (0.1)	PROC-98.
	2	Head-actuator assembly	15%	T22 (0.8)	CARR-25
	3	Drive analog card	10%	T21 (0.6)	CARR-20
	4	Drive logic card	10%	L01 (0.5)	CARR-16
	5	Mother board	5%	L02 (1.0)	CARR-28
F3	Servo error				
	1	Tape cartridge or hardware	60%	D07 (0.1)	"FID FE—Isolate Fault between Media and Hardware" on page PROC-98.
	2	Head-actuator assembly (D08=clean only, T22=replace)	15%	D08/T22 (0.8)	CARR-25
	3	Drive servo card	10%	T53 (1.0)	CARR-27
	4	Drive analog card	5%	T21 (0.6)	CARR-20
	5	Mother board	5%	L02 (1.0)	CARR-28
	6	Drive sensor cable	5%	T04 (1.1)	CARR-29
F4	RS-422 bus error (drive logic card or RS-422 cables)				
	1	RS-422 interface problem	—	—	Run the RS-422 wrap test. See "RS-422 Port Wrap Test" on page PROC-89. If problem re-occurs, replace the following FRUs. If that does not fix the problem, get a microcode dump and contact your next level of support.
	2	Drive logic card	80%	L01 (0.5)	CARR-16
	3	RS-422 cable-internal to drive	10%	C04 (0.1)	CARR-35
	4	RS-422 cable, drive to drive	10%	C04 (0.1)	CARR-35
F5	SCSI bus error (drive logic card or SCSI cables)				
	1	SCSI interface, operator procedural, or host problem	—	—	Run the SCSI wrap test. See "SCSI Port Wrap Test" on page PROC-84. If problem re-occurs, replace the following FRUs. If that does not fix the problem, get a microcode dump and contact your next level of support.
	2	Drive logic card	80%	L01 (0.5)	CARR-16
	3	Internal SCSI cable	20%	C04 (0.2)	CARR-34

Figure 8 (Page 12 of 12). FIDs, FRUs, and TACs

Reported FID	Repair Sequence	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
F6	Informational message—Cleaning required due to performance.				
	1	Operator, procedural, or host problem	100%	—	See 5 on page START-23 below.
FE	Read/write error. See “FID FE—Isolate Fault between Media and Hardware” on page PROC-98.				
	1	Tape cartridge or hardware	100%	D07 (0.1)	“FID FE—Isolate Fault between Media and Hardware” on page PROC-98
FF	Informational or non-hardware related status or error				
	1	Operator, procedural, or host problem	100%	—	See 5 on page START-23 below.
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. The cartridge-present sensor is part of the drive logic card.</li> <li>2. The cartridge type sensor is part of the drive loader assembly.</li> <li>3. These parts are all part of the drive loader assembly.</li> <li>4. This line item is for failures in the drive logic card itself.</li> <li>5. Information FID F6 or FF with FSCs 7036, 7037, 7038 and C559 are normal. These FSCs are generated when a drive requires cleaning or when a drive has been cleaned.</li> </ol>					

## Attention Drive Messages

Library machines:

1. Some attention messages (ATTENTION DRIVE) have an associated FID that is not displayed until you press the Enter push button.
2. Use Figure 9 for ATTENTION DRIVE messages without an associated FID.
3. If ATTENTION DRIVE is displayed, press the Enter push button. If a FID appears, go to “FID Entry Point” on page START-12.
4. If no FID is presented, use Figure 9 to find the fault.

Drive-only machines:

1. On drive-only installations the drive Busy and Clean LED indicators will be on solid to show that a ‘ATTENTION DRIVE’ is being presented. This may apply to all ATTENTION DRIVE messages except FSC Trap Taken.
2. See “Drive Indicators-Normal Operation for Drive-Only Models” on page START-10 for the meaning of these flashing LEDs.

Figure 9. ATTENTION DRIVE Messages

Message Meaning	FRUs	FRU Name	Probability	TAC Code & (Duration in hours)	Page Reference
Load Unload Error	1. Ensure that the cartridge and tape are not broken. 2. Ensure that the cartridge is a 3570 compatible-type cartridge. 3. Before replacing FRUs below, ensure that the loader sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	FE	Tape cartridge	50%	D07 (0.1)	Customer supply, PROC-98
	BC	Loader asm	40%	T45 (1.6)	CARR-28
	EC	Drive servo card	7%	T53 (1.0)	CARR-27
	EA	Drive logic card	2%	L01 (0.5)	CARR-16
	E9	Mother board	1%	L02 (1.0)	CARR-28
FSC Trap Taken	The microcode encountered the trap address set from a CE panel menu. This is valid only for library models.				
	—	Not a fault	—	—	—
Tension Dropped	Tape motion error (velocity or tape slipping error). Check the tape cartridge before replacing any FRUs.				
	FE	Tape cartridge	70%	D07 (0.1)	Customer supply PROC-98
	BC	Loader asm	27%	T45 (1.6)	CARR-28
	EC	Drive servo card	3%	T53 (1.0)	CARR-27
Invalid cartridge	1. Ensure that the cartridge and tape are not broken. 2. Ensure that the cartridge is a 3570 compatible-type cartridge. 3. Before replacing FRUs below, ensure that the loader sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	FE	Tape cartridge	60%	D07 (0.1)	Customer supply PROC-98
	BC	Loader asm	30%	T45 (1.6)	CARR-28
	EA	Drive logic card	4%	L01 (0.5)	CARR-16
	EC	Drive servo card	4%	T53 (1.0)	CARR-27
	E9	Mother board	2%	L02 (1.0)	CARR-28

# Attention Library Messages

Some attention messages (ATTENTION LIBRARY) have an associated FID that is not displayed until you press the Enter push button. Use Figure 10 for ATTENTION LIBRARY messages without an associated FID.

1. If ATTENTION LIBRARY is displayed, press the Enter push button. If a FID appears, go to “FID Entry Point” on page START-12.
2. If no FID is presented, use Figure 10 to find the fault.
3. If an Attention and Supplemental Message indicating DRIVE DISABLED UNTIL CLEANED is displayed, the tape drive must be cleaned before further use of the drive is allowed. See “Resolving ATTENTION Messages” on page PANEL-10 for further information.

*Figure 10 (Page 1 of 5). ATTENTION LIBRARY Messages*

Message Meaning	FRUs	FRU Name or Description	Prob-ability	TAC Code & (Duration in hours)	Page Reference or Instruction
Move Error	Ensure that the cartridge is not damaged or the tape broken, and that the cartridge is a 3570 cartridge. Also ensure that at least one magazine is installed and that there is no global obstruction in the picker path. Before replacing FRUs below, ensure that the global and priority cell sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	9A	Picker assembly	50%	T12 (0.1)	CARR-40
	FD	Magazine	20%	Q05 (0.1)	Customer-purchased
	BC	Loader assembly	10%	T45 (1.6)	CARR-28
	CA	Loader-home sensor	6%	T31 (0.1)	CARR-33
	EA	Cartridge-present sensor (on drive logic card)	5%	T31 (0.5)	CARR-16
	97	Library control card	3%	T15 (0.1)	CARR-38
	99	Picker cable	3%	C03 (0.1)	CARR-39
Timeout Error	An operation timed out or did not complete in the allotted timeframe. This is usually caused by a hardware failure. Before replacing FRUs below, ensure that the global and priority cell sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	9A	Picker assembly	50%	T12 (0.1)	CARR-40
	FD	Magazine	20%	Q05 (0.1)	Customer-purchased
	BC	Loader assembly	10%	T45 (1.6)	CARR-28
	CA	Loader-home sensor	6%	T31 (0.1)	CARR-33
	EA	Cartridge-present sensor (on drive logic card)	5%	T31 (0.5)	CARR-16
	97	Library control card	3%	T15 (0.1)	CARR-38
	99	Picker cable	3%	C03 (0.1)	CARR-39
A5	Library sensor cable	3%	T04 (0.4)	CARR-50	

Figure 10 (Page 2 of 5). ATTENTION LIBRARY Messages

Message Meaning	FRUs	FRU Name or Description	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
Clear Picker Path A	<p>The device detected the presence of a possible blockage in the cartridge path, such as in the magazine or in the priority cell.</p> <ol style="list-style-type: none"> <li>1. Check the position of all cartridges to ensure they are properly positioned in the magazine and in the priority cell. A cartridge that extends too far into the magazine in the import position or a damaged cartridge can cause this error.</li> <li>2. Check for a binding or sticking cartridge door.</li> <li>3. Remove the magazine and look for any obvious obstructions.</li> <li>4. Try another magazine in the library.</li> <li>5. Before replacing FRUs below, ensure that the global and priority cell sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	9C	Magazine global sensor pair (A)	90%	T31 (0.2)	CARR-41
	97	Library control card	6%	T15 (0.1)	CARR-38
	A5	Library sensor cable	4%	T04 (0.4)	CARR-50
Clear Picker Path B	<p>The device detected the presence of a possible blockage in the cartridge path between the drive and the picker, or between the cleaner cell and the picker.</p> <ol style="list-style-type: none"> <li>1. Check the position of the cleaner cartridge and ensure that it is fully seated within the cleaner cell. If the cleaner cartridge is not fully seated in the cleaner cell, replace the cleaner cell retention spring (P/N 05H2912).</li> <li>2. Ensure that no cartridges or other obstacles are in the picker path between the drive and the picker.</li> <li>3. Check for a binding or sticking cartridge door.</li> <li>4. Before replacing FRUs below, ensure that the global, picker and loader sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	9B	Drive global sensor pair (B)	90%	T31 (0.2)	CARR-41
	97	Library control card	6%	T15 (0.1)	CARR-38
	A5	Library sensor cable	4%	T04 (0.4)	CARR-50
Wrong Mode	An operation was requested from the initiator which cannot be run with the current mode setting.				
	—	—	100%	Q05	Change mode to Auto, Random, or Manual as needed.
No Magazine 1, 2, or Both	<ol style="list-style-type: none"> <li>1. Ensure that the appropriate magazine is properly installed and latched in place. If the ATTENTION LIBRARY message persists, try a different magazine. If a different magazine fails to correct the problem, replace the FRUs below: <b>HINT: If both magazines are present, but neither is being sensed, the problem is not likely to be the sensor or cable.</b></li> <li>2. Before replacing FRUs below, ensure that the magazine sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	A0	Magazine 2 sensor	44%	T31 (0.2)	CARR-48
	A1	Magazine 1 sensor	44%	T31 (0.1)	CARR-49
	97	Library control card	6%	T15 (0.1)	CARR-38
	A5	Library sensor cable	4%	T04 (0.4)	CARR-50

Figure 10 (Page 3 of 5). ATTENTION LIBRARY Messages

Message Meaning	FRUs	FRU Name or Description	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
No cartridge	<p>The device detects the presence of cartridges, but cannot find a cartridge in the <b>import</b> position in the magazine or the priority cell.</p> <ol style="list-style-type: none"> <li>1. Check the position of all the cartridges to ensure they are properly positioned in the import position of the magazine and the priority cell. If this condition is not cleared, remove and replace the magazine.</li> <li>2. Press Start.</li> <li>3. Before replacing FRUs below, ensure that the magazine and priority cell sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	9A	Picker assembly	50%	T12 (0.1)	CARR-40
	9E	Priority cell cartridge-present sensor	30%	T31 (0.1)	CARR-48
	97	Library control card	10%	T15 (0.1)	CARR-38
	A5	Library sensor cable	7%	T04 (0.4)	CARR-50
Extra cartridge	<p>The device loaded a cartridge from the magazine and detected that another cartridge was placed in its home position. The device attempts to place the now-displaced cartridge in the priority cell to await operator action. If the priority cell is full, it ejects the cartridge when the priority slot is unloaded or when the Enter push button is pressed.</p> <ol style="list-style-type: none"> <li>1. Ensure that no cartridge has been inserted into an 'in use' cell.</li> <li>2. Before replacing FRUs below, ensure that the appropriate sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	9E	Priority cell cartridge-present sensor	40%	T31 (0.1)	CARR-48
	9A	Picker assembly	30%	T12 (0.1)	CARR-40
	97	Library control card	20%	T15 (0.1)	CARR-38
	A5	Library sensor cable	5%	T04 (0.4)	CARR-50
No Cleaner cartridge	<p>A request was made to clean the head, but the device cannot find a cleaner cartridge in the cleaner cell.</p> <ol style="list-style-type: none"> <li>1. Check the cleaner cell to ensure that a cleaner cartridge is present in the cell.</li> <li>2. Ensure that it is a <b>cleaner cartridge</b> and not just a data cartridge. The holes in the casing are different and the media in the cleaner cartridge does not fill the entire cartridge. Cleaner cartridges have a gray file protect lever.</li> <li>3. Before replacing FRUs below, ensure that the cleaner cartridge present sensor is operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</li> </ol>				
	A3	Cleaner cartridge- present sensor	64%	T31 (0.1)	CARR-49
	9A	Picker assembly	21%	T12 (0.1)	CARR-40
	A5	Library sensor cable	10%	T04 (0.4)	CARR-50
	97	Library control card	5%	T15 (0.1)	CARR-38

Figure 10 (Page 4 of 5). ATTENTION LIBRARY Messages

Message Meaning	FRUs	FRU Name or Description	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
Tach Error	A tach error was detected during an accessor motor operation.				
	<ol style="list-style-type: none"> <li>1. Check for anything that might obstruct picker movement.</li> <li>2. Ensure that cartridges are positioned in the magazine properly.</li> <li>3. If the above checks don't fix the problem, cycle the power off then on to the 3570 and observe the accessor assembly before replacing FRUs.                             <ol style="list-style-type: none"> <li>a. If the accessor motor assembly can move the picker back and forth, replace the accessor assembly before replacing any of the other FRUs.</li> <li>b. If accessor motor assembly cannot move the picker back and forth, replace the FRUs in the order listed below.</li> </ol> </li> </ol>				
	95	Accessor motor assembly	80%	T17 (0.2)	CARR-38
	97	Library control card	10%	T15 (0.1)	CARR-38
	A5	Library sensor cable	6%	T04 (0.4)	CARR-50
	99	Picker cable	2%	C03 (0.1)	CARR-39
Library IRQ Fault	A library interrupt is on solid. Insure that the power cable from the power supply to the library control card is plugged and not loose. A drawing of this cable with expected voltages is located at Figure 14 on page MAPS-29. If the power is OK to the library control card, replace the following FRUs in the order listed:				
	97	Library control card	90%	T15 (0.1)	CARR-38
	C1	Power supply	10%	P04 (0.1)	CARR-32
Magazine Full	The magazine is full of cartridges. The device detected that the magazine cannot hold any more cartridges.				
	<b>Note:</b> Before replacing FRUs below, ensure that the priority cell, picker, and cartridge present sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.				
	FD	Cartridge magazine	95%	Q05 (0.1)	Remove the magazine and replace the cartridges or insert another full magazine.
	9A	Picker assembly	4%	T12 (0.1)	CARR-40
Library Not Enabled	Ensure there are cartridges in the library and that they are seated in the import position.				
	9E	Priority cell cartridge-present sensor	48%	T31 (0.1)	CARR-48
	9A	Picker assembly	34%	T12 (0.1)	CARR-40
	A5	Library sensor cable	10%	T04 (0.4)	CARR-50
	97	Library control card	5%	T15 (0.1)	CARR-38
Feed Over-current	An overcurrent condition was detected in the library feed motor circuitry.				
	97	Library control card	60%	T15 (0.1)	CARR-38
	9A	Picker assembly	20%	T12 (0.1)	CARR-40
Pinch Over-current	An overcurrent condition was detected in the library pinch motor circuitry.				
	97	Library control card	60%	T15 (0.1)	CARR-38
	9a	Picker assembly	20%	T12 (0.1)	CARR-40
Picker Over-current	An overcurrent condition was detected in the library picker motor circuitry.				
	97	Library control card	60%	T15 (0.1)	CARR-38
	9A	Picker assembly	20%	T12 (0.1)	CARR-40



Figure 10 (Page 5 of 5). ATTENTION LIBRARY Messages

Message Meaning	FRUs	FRU Name or Description	Probability	TAC Code & (Duration in hours)	Page Reference or Instruction
Transport Full	<p>The picker attempted to unload a cartridge but had no place to put it. A tape cartridge is present in slot that the device tried to unload to, or it appears to the machine that the slot is full. Could be a full slot or a sense error. The tape cartridge was left in the transport.</p> <p>1. Ensure that a cartridge was not placed in an <b>in use</b> cell, causing this failure.                  2. Before replacing FRUs below, ensure that the priority cell, picker, and cartridge present sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</p>				
	FE	Tape cartridge	70%	— (0.1)	Remove the cartridge
	9A	Picker assembly	20%	T12 (0.1)	CARR-40
	97	Library control card	6%	T15 (0.1)	CARR-38
	FD	Magazine	4%	Q05 (0.1)	Check magazine for defect.
Library Door Open	<p>The device detected that the library door was opened.</p> <p><b>Note:</b> Before replacing FRUs below, ensure that the library door sensor is operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</p>				
	—	Library door open is a normal condition if the operator has been adding or removing cartridges without using the priority cell position. If the door was not opened, but the machine thinks it was, replace the FRUs that follow until the problem is fixed.	—	—	Close the library door.
	AA	Library door open sensor	90%	T31 (0.2)	CARR-51
	97	Library control card	6%	T15 (0.1)	CARR-38
	A5	Library sensor cable	4%	T04 (0.4)	CARR-50
Target Cell Full	<p>The device detected that the destination cell was full.</p> <p><b>Note:</b> Before replacing FRUs below, ensure that the priority cell, picker, and cartridge present sensors are operating correctly. See Figure 130 on page PANEL-27 and select <b>UTILITIES</b> from the CE OPTIONS Menu, then select <b>DISP SENSORS</b> from the CE UTILITIES Menu.</p>				
	9E	Priority cell cartridge present sensor	70%	T31 (0.1)	CARR-48
	A5	Library sensor cable	20%	T04 (0.4)	CARR-50
	97	Library control card	10%	T15 (0.1)	CARR-38



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## Library Operator Panel Problems: MAP

This procedure helps you isolate library operator panel failures.

See the CARR section for check, adjustment, removal, and replacement procedures.

See "Operator Panel" on page PANEL-1 for a description of the operator panel.

Unless otherwise directed, run **Fix Verify** from the CE Options Menu to test the drive after a FRU replacement.

If the recommended repair actions do not fix the problem, call your next level of support.

The table below may send you to another MAP. If not, continue with this MAP.

<i>Figure 11. Library LED Type Failures and Where To Go First</i>	
<b>If You Have the Following Symptoms</b>	<b>Go Here First</b>
Library LEDs flash continuously	Go to Library LED Problems step 005 on page MAPS-5.
Some or all library LEDs fail to light at Power-on	Go to Library LED Problems step 008 on page MAPS-5.
Not all library LEDs come on at Power-on	Go to Library LED Problems step 023 on page MAPS-7.
None of these symptoms were noted	Go to Step 001.

**001**

(From page MAPS-3)

Have the customer vary the drive offline, if not done before.

Perform "Prepare the Tape Device for Service" on page PROC-6.

Switch on power to the library device.

**Can you see any display on the library operator panel display?**

Yes No

**002**

Switch power off to the library device, then power-on and observe the three LEDs that normally indicate that the two magazines and priority cell are busy. The LEDs should flash on and off during power on, then go off after the bring-up diagnostics complete execution.

**Did any of the library operator panel LEDs light?**

Yes No

**003**

(Step **003** continues)

**003** (continued)

A power problem is causing the operator panel to fail. Go to "Power Problems: MAP" on page MAPS-13 for further isolation. Return to this procedure if the power supply is OK.

**004**

3570 power is good to the library control card which drives the library operator panel LEDs.

– Refer to Figure 135 on page PANEL-32 and run the Panel Test Option of the diagnostic test.

**Note:** Panel Test is on machines with microcode release 4\_xxx or later.

The test should allow you to see if each pixel turns on at the panel display.

**Did the test fail?**

Yes No

**005**

Go to Step 009 on page MAPS-4.

**006**

(Step **006** continues)

## Library Operator Panel Problems (continued)

### 006 (continued)

- Power the device off and check that the library operator panel display cable connector from the library operator panel display to the library control card is seated properly.

If the library operator panel display cable connector is seated, replace the following FRUs:

“FID 90: Library Operator Panel Display” on page CARR-36 (90%)

“FID 97: Library Control Card” on page CARR-38 (8%)

“FID A5: Library Sensor Cable” on page CARR-50 (2%)

**Note:** An alternative to replacing the library sensor cable is to perform a continuity check of the cable. If it checks OK, don't replace it.

---

007

A display is seen, but may not be correct.

**Does the data on the display seem to be correct?**

Yes No

008

Replace the following FRUs in the order listed:

“FID 90: Library Operator Panel Display” on page CARR-36 (90%)

“FID 97: Library Control Card” on page CARR-38 (8%)

“FID A5: Library Sensor Cable” on page CARR-50 (2%)

**Note:** An alternative to replacing the library sensor cable is to perform a continuity check of the cable. If it checks OK, don't replace it.

009

(From Library LED Problems step 013 on page MAPS-6)

(From step 005)

(Step 009 continues)

### 009 (continued)

The display appears to be working for now. If the problem appears again, replace the following FRUs in the order listed:

“FID 90: Library Operator Panel Display” on page CARR-36 (90%)

“FID 97: Library Control Card” on page CARR-38 (8%)

“FID A5: Library Sensor Cable” on page CARR-50 (2%)

**Note:** An alternative to replacing the library sensor cable is to perform a continuity check of the cable. If it checks OK, don't replace it.

---

## Library LED Problems: MAP

This procedure helps you isolate library LED failures.

See the CARR section for check, adjustment, removal, and replacement procedures.

See "Operator Panel" on page PANEL-1 for a description of the operator panel.

Unless otherwise directed, run **Fix Verify** from the CE Options Menu to test the drive after a FRU replacement.

If the recommended repair actions do not fix the problem, call your next level of support.

**001**

Perform "Prepare the Tape Device for Service" on page PROC-6.

Switch on power to the library device and observe the 3 LEDs that normally light when the magazines or priority cell are busy. The 3 LEDs should flash on and off during bring-up diagnostics, then go off when the library is initialized.

**Did any of the three library LEDs light?**

Yes No

**002**

None of the three library LEDs lit during bring-up. Continue at Step 008.

**003**

At least one library LED lit. The library LEDs should flash for a short while, then go off. If they continue to flash indefinitely, a problem with library initialization has occurred.

**Do the library LEDs flash on and off continuously (more than one minute)?**

Yes No

**004**

Continue at Step 023 on page MAPS-7.

**005**

(From page MAPS-3)

(From step 029)

When the library LEDs flash on and off continuously, the library operator panel display usually has only 2 blank (dark) lines displayed. The library device was never initialized by the microcode.

Since this is a library problem, perform removal of the following:

"Library Chassis Covers" on page CARR-4.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Now that you have access to the cable that runs from the power supply to the mother board, power-off the device and remove the end that is plugged into connector CD3. A diagram is located at Figure 15 on page MAPS-29. Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the mother board.

**Does the voltage check OK?**

Yes No

**006**

Replace the following FRUs in the order listed.

Power supply (80%)

Cable from the power supply to the mother board (20%)

**007**

Power is OK to the mother board. Replace the following FRUs in the order listed.

Drive logic card (60%)

Library control card (30%)

Mother board (5%)

Library interface cable (3%)

Library sensor cable (2%)

**008**

(From page MAPS-3)

(From steps 002 and 025)

(Step **008** continues)

## Library LED Problems (continued)

**008** (continued)

Some or all library LEDs failed to light during power-up.

**Is the library operator panel display completely blank?**

**Yes No**

**009**

Continue at Step 011.

**010**

The library operator panel display is completely blank. Continue at Step 018 on page MAPS-7.

**011**

(From step 009)

Display is not blank.

**Does the library operator panel display have 2 dark lines showing continuously?**

**Yes No**

**012**

- Refer to Figure 135 on page PANEL-32 and run the Panel Test Option of the diagnostic loop routine. This option should allow you to determine if all the pixels are working correctly in the operator panel display.

**Note:** The Panel Test is only on machines with microcode level 4\_xxx or higher.

**Did the Panel Test fail?**

**Yes No**

**013**

Go to <Library Operator Panel Problems step 009 on page MAPS-4

**014**

Perform the following remove procedures:  
“Library Chassis Covers” on page CARR-4.  
(Step **014** continues)

**014** (continued)

Replace the following FRUs in the order listed:

Library control card (40%)

Library LED card (40%)

Library sensor cable (20%)

**015**

Two dark lines on the library operator panel display indicate that the microcode is not running properly. With power-off, perform the following remove procedures:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Now that you have access to the cable that runs from the power supply to the mother board, power-off the device and remove the end that is plugged into connector CD3. A diagram is located at Figure 15 on page MAPS-29. Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the mother board.

**Does the voltage check OK?**

**Yes No**

**016**

Replace the following FRUs in the order listed:

Power supply (80%)

Cable from the power supply to the mother board (20%)

**017**

Power is OK to the library control card which drives the library operator panel LEDs and library operator panel display. Replace the following FRUs in the order listed:

Library control card (50%)

Drive logic card (40%)

(Step **017** continues)



**017** (continued)

Mother board (5%)

Library sensor cable (3%)

Library interface cable (2%)

**018**

(From step 010)

With power-off, perform the remove procedure at “Library Chassis Covers” on page CARR-4.

Now that you have access to the cable that runs from the power supply to the library control card, power-off the device and remove the end of the cable that is plugged into connector CD5 on the library control card. A diagram is located at Figure 14 on page MAPS-29. Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the library control card.

**Does the voltage check OK?**

**Yes No**

**019**

Replace the following FRUs in the order listed:

Power supply (80%)

Cable from the power supply to the library control card (20%)

**020**

Power is OK to the library control card. Observe the drive LEDs while powering off, then back on. They should all light for a short time, then go off, then the Maintenance LED should flash while the drive diagnostics are running.

**Did the drive LEDs all come on and stay on?**

**Yes No**

**021**

Replace the following FRUs in the order listed:

Library control card (80%)  
(Step **021** continues)

**021** (continued)

Library interface cable (10%)

Library sensor cable (10%)

**022**

Perform the following remove procedures:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed:

Drive logic card (80%)

Library control card (10%)

Drive servo card (5%)

Mother board (5%)

**023**

(From page MAPS-3)

(From step 004)

Some of the library LEDs are working OK, some may not be working properly. During power-on, the 2 magazine and priority cell LEDs should flash on and off until the bring-up diagnostics are completed. Power-off, then power-on the device, and observe the library LEDs.

**Do all of them flash on and off?**

**Yes No**

**024**

**Do any of the 3 LEDs flash on and off?**

**Yes No**

**025**

Continue at Step 008 on page MAPS-5.

**026**

Replace the following FRUs in the order listed:

Library LED card (80%)

Library sensor cable (20%)

## Library LED Problems (continued)

027

All the library LEDs flash on and off. They should flash on and off for a short time until bring-up diagnostics are complete. Then they should turn off.

**Do they flash on and off continuously?**

**Yes**   **No**

028

This is a normal situation. The machine is working as it should.

029

Continue isolation at Step 005 on page MAPS-5.

## Drive LED Problems: MAP

This procedure helps you isolate Drive LED failures.

See the CARR section for check, adjustment, removal, and replacement procedures.

See "Operator Panel" on page PANEL-1 for a description of the operator panel.

Unless otherwise directed, run **Fix Verify** from the CE Options Menu to test the drive after a FRU replacement.

If the recommended repair actions do not fix the problem, call your next level of support.

**001**

Have the customer vary the drive offline, if not done before.

Perform "Prepare the Tape Device for Service" on page PROC-6.

**Note:** If this drive is installed inside a library model, by removing a tape cartridge from the priority cell location, and viewing in toward the drive, you can see the drive LEDs without having to remove the Library top cover.

Switch on power to the device and observe the 3 LEDs labeled Busy, Clean, and Maintenance. The LEDs should all light for a few seconds during the first phase of internal electronics testing, at power on. When the first phase is complete, the microcode will turn off all three LEDs momentarily. Next, the Maintenance LED should flash during the next phase of the electronic diagnostic bring-up. When all the tests complete successfully, all three LEDs will go off.

Now, power on the device and observe the drive LEDs.

**Did any of the drive LEDs light?**

**Yes No**

**002**

Continue at Step 012 on page MAPS-10.

**003**

At least some drive LEDs lit. The LEDs should have gone off after completion of the bring-up diagnostics.

**Did the drive LEDs come on and stay on solid?**

**Yes No**

**004**

(Step **004** continues)

**004** (continued)

Continue at Step 015 on page MAPS-11.

**005**

The drive LEDs come on and stay on at Power-on.

**Is this a library model?**

**Yes No**

**006**

Perform the following removal procedures:

"Decorative Cover—Drive-Only Models" on page CARR-5.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the order listed:

Drive logic card (80%)

Drive servo card (10%)

Mother board (5%)

Drive sensor cable (3%)

Drive LED card (2%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

**007**

This is a library model. Power-off, then power-on the library device and observe the 3 LEDs on the library operator panel. They should flash on and off until the bring-up diagnostics are complete. (Step **007** continues)

## Drive LED Problems (continued)

007 (continued)

Did any of the library LEDs flash on and off?

Yes No

008

Perform the following remove procedures:  
“Library Chassis Covers” on page CARR-4.

For this step, refer to Figure 14 on page MAPS-29, then power-off the library and remove the power cable plugged into the top of the library control card at connector CD5. The other end goes to the power supply. Power-on and check for proper voltages at the CD5, as defined in the referenced figure.

Do the voltages check OK?

Yes No

009

One or more voltages are missing. Replace the following FRUs in the order listed.

Power supply (80%)

Cable from the power supply to the library control card (20%)

010

Voltages were OK. Perform the following remove procedures:

“Library Chassis Covers” on page CARR-4 if not done before.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed.

Drive logic card (60%)

Library control card (20%)

Drive servo card (10%)

Mother board (5%)

Drive sensor cable (3%)

(Step 010 continues)

010 (continued)

Drive LED card (2%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

---

011

Library operator panel LEDs flash on and off. Replace the following FRUs in the order listed.

Drive logic card (80%)

Drive servo card (10%)

Mother board (5%)

Drive sensor cable (3%)

Drive LED card (2%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

---

012

(From step 002)

The drive LEDs did not light at Power-on.

If this is a library model, perform the following removal procedures:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

If this is a drive-only model, perform the following removal procedures:

“Decorative Cover—Drive-Only Models” on page CARR-5.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

You now have access to the power cable going from the power supply to the mother board. Also, refer to Figure 15 on page MAPS-29 for a power diagram. Unplug the power cable from mother board at connector CD3, and power the device on. Check for the appropriate voltages at the cable pins shown in the referenced figure.

(Step 012 continues)

**012** (continued)

**Does power check OK at the cable end?**

**Yes No**

**013**

Power is missing at the cable. Replace the following FRUs in the order listed.

Power supply (80%)

Power cable from the power supply to the mother board (20%)

**014**

Power to the mother board checks OK. Replace the following FRUs in the order listed.

Drive logic card (80%)

Drive servo card (10%)

Mother board (5%)

Drive sensor cable (3%)

Drive LED card (2%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**015**

(From step 004)

At least some drive LEDs lit.

**Do all 3 LEDs light for a few seconds when power comes up?**

**Yes No**

**016**

At least one LED failed to light.

If this is a library model, perform the following removal procedures:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

If this is a drive-only model, perform the following removal procedures:

(Step **016** continues)

**016** (continued)

“Decorative Cover—Drive-Only Models” on page CARR-5.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed:

“FID B1: Drive LED Card” on page CARR-31 (50%)

“FID EC: Drive Servo Card and FID E9: Mother Board” on page CARR-27 (20%)

“FID EA: Drive Logic Card” on page CARR-16 (20%)

“FID DA: Drive Sensor Cable” on page CARR-29 (5%)

“FID E9: Mother Board” on page CARR-28 (5%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**017**

The drive LEDs appears to be working now. The problem may be intermittent. If the LED failure returns, perform the following:

If this is a library model, perform the following removal procedures:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

If this is a drive-only model, perform the following removal procedures:

“Decorative Cover—Drive-Only Models” on page CARR-5.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Now replace the following FRUs in the order listed until the problem is resolved.

“FID B1: Drive LED Card” on page CARR-31 (88%)

(Step **017** continues)

## Drive LED Problems (continued)

### 017 (continued)

"FID EC: Drive Servo Card and FID E9: Mother Board" on page CARR-27 (5%)

"FID EA: Drive Logic Card" on page CARR-16 (5%)

"FID DA: Drive Sensor Cable" on page CARR-29 (1%)

"FID E9: Mother Board" on page CARR-28 (1%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

---

## Power Problems: MAP

This procedure helps you isolate power failures.

See the CARR section for check, adjustment, removal, and replacement procedures.

See "Power Supply" on page INTRO-17 for a description of 3570 power.

Unless otherwise directed, run **Fix Verify** from the CE Options Menu to test the drive after a FRU replacement.

If the recommended repair actions do not fix the problem, call your next level of support.

**001**

Have the customer vary the drive offline, if it was not already done.

"Prepare the Tape Device for Service" on page PROC-6.

Perform necessary Remove/Replace procedures as follows:

For drive-only models, perform removal of the "Decorative Cover—Drive-Only Models" on page CARR-5 to expose the power supply for further service, then return here.

For library models, perform removal of the "Library Chassis Covers" on page CARR-4 to expose the power supply for further service, then return here.

If more than one drive is installed in the library device, answer the following questions for both drives. When a distinction needs to be made between the two drives, they will be called Drive 1 and Drive 2.

If your device has only one drive, this MAP will call it drive 1.

If power was removed to perform the above procedures, apply power to the product now.

**Does a power supply fan fail to rotate?**

**Yes No**

**002**

The fan or fans are rotating. Power is getting to the fan motors. Continue at Step 021 on page MAPS-15.

**003**

Unplug the 3570 power cord from the source outlet. Measure the ac voltage at the source outlet.

(Step **003** continues)

**003** (continued)

**Is ac voltage at the source outlet correct?**

**Yes No**

**004**

Inform the customer that ac power is unavailable at the customer-provided outlet.

**005**

Disconnect the power cord from the 3570. Check the power cord for continuity.

**Is the power cord OK?**

**Yes No**

**006**

Replace the 3570 power cord (no FID).

**007**

**Is there only 1 drive in this device?**

**Yes No**

**008**

This is a library with 2 drives. Continue at Step 016 on page MAPS-14.

**009**

(From step 017)

Power off the device, refer to Figure 15 on page MAPS-29, and disconnect the cable from the mother board connector CD3 of drive 1.

**Note:** If you have only one drive, it is drive 1.

The other end of the cable goes to the power supply. This cable has four heavy wires and plugs into the mother board at the rear of the drive near the cooling assembly.

Power the device on and observe the cooling fan. (Step **009** continues)

## Power Problems (continued)

009 (continued)

Does the cooling fan turn on now?

Yes No

010

Is this a library device?

Yes No

011

Replace the "FID C1: Power Supply" on page CARR-32.

012

Power off the device, refer to Figure 14 on page MAPS-29, and disconnect the cable from the library control card connector CD5. The other end of the cable goes to the power supply. This cable has four heavy wires and plugs into the library control card at the top of the card.

Power the device on and observe the cooling fan.

Does the cooling fan turn on now?

Yes No

013

Replace the "FID C1: Power Supply" on page CARR-32.

014

Replace the "FID 97: Library Control Card" on page CARR-38.

015

Replace the following FRUs in the order listed:

"FID E9: Mother Board" on page CARR-28. (60%)

"FID C1: Power Supply" on page CARR-32. (20%)

"FID EA: Drive Logic Card" on page CARR-16. (10%)

Drive Servo Card, see "FID EC: Drive Servo Card and FID E9: Mother Board" on page CARR-27. (5%)

(Step 015 continues)

015 (continued)

"FID EB: Drive Analog Card" on page CARR-20. (5%)

016

(From step 008)

This device is a library with two drives.

Is drive 2 failing?

Yes No

017

Drive 1 or library power is failing. Continue at Step 009 on page MAPS-13.

018

Drive 2 is failing. Power off the device, refer to Figure 15 on page MAPS-29, and disconnect the cable from the mother board connector CD3. The other end of the cable goes to the power supply. This cable has four heavy wires and plugs into the mother board at the rear of the drive near the cooling assembly.

Power the device on and observe the cooling fan.

Does the cooling fan turn on now?

Yes No

019

Replace the "FID C1: Power Supply" on page CARR-32.

020

Replace the following FRUs in the order listed:

"FID E9: Mother Board" on page CARR-28. (60%)

"FID C1: Power Supply" on page CARR-32. (20%)

"FID EA: Drive Logic Card" on page CARR-16. (10%)

Drive Servo Card, see "FID EC: Drive Servo Card and FID E9: Mother Board" on page CARR-27. (5%)

"FID EB: Drive Analog Card" on page CARR-20. (5%)



**021**

(From step 002)

**Is this a library Model?**

**Yes No**

**022**

This is a drive-only model.  
Continue at Step 034 on page MAPS-16.

**023**

This is a library model. Power the library off then on and observe the library operator panel. Look at the library LEDs and the operator panel display.

**Does the library operator panel show any signs of power being on?**

**Yes No**

**024**

The library operator panel LEDs and display show no power to them.

Perform the following removals if not done before:

“Library Chassis Covers” on page CARR-4.

Find the cable that runs from the power supply to the library control card, power-off the device and remove the end that is plugged into connector CD5. A diagram is located at Figure 14 on page MAPS-29 Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the library control card.

**Does the voltage check OK?**

**Yes No**

**025**

Replace the following FRUs in the order listed.

Power supply (80%)

Cable from the power supply to the library control card (20%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**026**

Replace the following in the order listed:

Library control card (80%)

Mother board (10%)

Power supply (10%)

At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**027**

The library operator panel has power. Power to the library is probably OK. Power off the library and wait a few seconds. Power-on the library while observing the drive LEDs on the front of the drive pack.

**Do any of the drive LEDs in each installed drive light at all at power-on?**

**Yes No**

**028**

Perform the following removals on the failing drive if not done before:

“Library Chassis Covers” on page CARR-4.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Find the cable that runs from the power supply to the mother board, power-off the device and remove the end that is plugged into connector CD3. A diagram is located at Figure 15 on page MAPS-29. Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the mother board.

**Does the voltage check OK?**

**Yes No**

**029**

Replace the following FRUs, associated with the failing drive, in the order listed.

(Step 029 continues)

## Power Problems (continued)

**029** (continued)

Power supply (80%)

Cable from the power supply to the mother board (20%)

**030**

Power checks OK to the mother board.  
Replace the following FRUs from the failing drive in the order listed.

Drive servo card (45%)

Drive logic card (45%)

Mother board (10%)

Drive sensor cable (5%)

Drive LED card (5%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

**031**

LEDs light on the drive, but a power problem may still exist.

**Does the drive pack fan rotate in each installed drive with power on?**

**Yes No**

**032**

Replace the following FRUs in the order listed:

"FID C1: Power Supply" on page CARR-32 (90%).

"FID BE: Drive Cooling Fan" on page CARR-13 (9%).

Cable from the power supply to the drive pack fan (no FID assigned) (1%).

**Note:** An alternative to replacement of this cable is to disconnect both ends and continuity check the cable. If it checks OK, do not replace it.

**033**

The power supply appears to be OK, but there may be an intermittent failure or a failure in the cable from the power supply to the electronic

controls. If unable to determine the failure, call the support center.

**034**

(From step 022)

This is a drive-only model with a power problem. Power the drive off then on and observe the drive LEDs on the front of the drive pack.

**Do any of the LEDs light at all at power-on?**

**Yes No**

**035**

**Does the drive pack fan rotate with power on?**

**Yes No**

**036**

Replace the following FRUs in the order listed:

"FID BE: Drive Cooling Fan" on page CARR-13 (90%).

"FID C1: Power Supply" on page CARR-32 (9%).

Cable from the power supply to the drive pack fan (no FID) (1%).

**Note:** An alternative to replacement of this cable is to disconnect both ends and continuity check the cable. If it checks OK, do not replace it.

**037**

Both the power supply fan and the drive fan are rotating with power on, but the drive LEDs fail to light.

Perform the following removal procedures:

"Decorative Cover—Drive-Only Models" on page CARR-5.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

You now have access to the power cable going from the power supply to the mother board. Also, refer to Figure 15 on

page MAPS-29 for a power diagram.  
 Unplug the power cable from mother board at connector CD3, and power the device on. Check for the appropriate voltages at the cable pins shown in the referenced figure.

**Does power check OK at the cable end?**

**Yes No**

**038**

Power is missing at the cable.  
 Replace the following FRUs in the order listed.

Power supply (80%)

Power cable from the power supply to the mother board (20%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

**039**

Power to the mother board checks OK.  
 Replace the following FRUs in the order listed.

Drive logic card (80%)

Drive servo card (10%)

Mother board (5%)

Drive sensor cable (3%)

Drive LED card (2%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

**040**

LEDs light on the drive and the power supply fan rotates, but a power problem may still exist.

**Does the drive pack fan rotate with power on?**

**Yes No**

**041**

Replace the following FRUs in the order listed:

(Step **041** continues)

**041** (continued)

Drive cooling fan (80%).

Power supply (15%).

Cable from the power supply to the drive pack fan (no FID) (5%).

**Note:** An alternative to replacement of this cable is to disconnect both ends and continuity check the cable. If it checks OK, do not replace it.

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

**042**

The power supply appears to be OK, but there may be an intermittent failure or a failure in the cable from the power supply to the electronic controls. Perform "Verify Fix" on page PROC-9 and if a failure occurs, restart into the MAPs from the START section. If unable to get the failure to occur, but the customer is getting failures, call the support center.



## 3570 Tape Cartridge Damage Problems: MAP

This procedure helps you isolate tape cartridge damage problems.

See the CARR section for check, adjustment, removal, and replacement procedures.

See "Operator Panel" on page PANEL-1 for a description of the operator panel.

Unless otherwise directed, run **Fix Verify** from the CE Options Menu to test the drive after a FRU replacement.

If the recommended repair actions do not fix the problem, call your next level of support.

### 001

Tape cartridges may be damaged when certain failures occur on the 3570 drive. Refer to the table below and attempt to find the tape damage symptom that brought you here, then follow the recommended MAP entry or maintenance procedure:

*Figure 12. Tape Damage Symptoms, Possible Causes, and Where To Go*

Symptom That Brought You Here	Possible Causes/Comments	MAP Entry
Broken tape	Outbound RR motor missing tach pulses Failure of circuitry to detect tach pulses	Go to Step 002.
Stretched tape	Outbound RR motor missing tach pulses Failure of circuitry to detect tach pulses	Go to Step 003.
Folded over or wrinkled tape within cartridge	Inbound RR motor running away Failure of dynamic brake	Go to Step 004.

### 002

(From step 001)

Broken tape is your symptom. Replace the following FRUs in the failing drive in the order listed:

Drive servo card (48%)

Loader assembly (48%)

Drive logic card (3%)

Mother board (1%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

### 003

(From step 001)

Stretched tape is your symptom. Replace the following FRUs in the failing drive in the order listed:

(Step **003** continues)

### 003 (continued)

Drive servo card (48%)

Loader assembly (48%)

Drive logic card (3%)

Mother board (1%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

### 004

(From step 001)

Folded over or wrinkled tape is your symptom. Failure may be caused by failure of dynamic brake on input motor

Replace the following FRUs in the failing drive in the order listed:

Loader assembly (motor failure) (48%)

Drive servo card (48%)

(Step **004** continues)

## 3570 Tape Cartridge Damage Problems (continued)

**004** (continued)

Drive logic card (3%)

Mother board (1%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

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## Other Obvious Symptom Problems: MAP

This MAP is intended to assist in repairing problems that are **not** your normal **FID display**, **ATTENTION DRIVE** or **ATTENTION LIBRARY** message. The device may be hung or have an unusual LED display.

Refer to Figure 13 and attempt to find the symptom you are looking to fix. Some columns have more than one symptom listed. If all don't apply, but **one** does, try the recommended **MAP Entry**.

*Figure 13. Symptoms, Comments, and Where To Go*

One or More Symptoms That Brought You Here	Comments and Directions	MAP Entry
Library attachment not recognized Library never calibrates on Power On Library operator panel display has two dark lines	Drive or drive to library interface failure	Go to Step 001.
The three drive LEDs stay on solid and the device appears to be hung.	Drive or library circuit failure.	Go to Step 004 on page MAPS-22.
The library operator panel display has a <i>Recovery Started</i> message with a FSC number, but the device appears to be hung.	Microcode or drive logic card failure.	Go to Figure 8 on page START-12 and follow the FID E6 entry in the table.
The library or drive-only device hangs.	Drive or library circuit failure	Go to Step 004 on page MAPS-22.
A drive's LEDs all light at power on, then go off, but the device is hung. The library LEDs all come on but the library operator panel display appears to be hung (library models).	Drive or library circuit failure.	Go to Step 022 on page MAPS-25.
The library device doesn't recognize that a magazine is present.	Library magazine sensor circuit failure.	Go to Step 016 on page MAPS-24.
The library device doesn't recognize a cartridge is present in the priority cell.	The cartridge not in <b>import</b> position. The priority cell cartridge-present sensor may be failing.	Go to Step 019 on page MAPS-25.
The Maintenance LED is on solid, and none of the other drive LEDs are on.	Drive logic card failure	Go to Step 033 on page MAPS-27.
A drive Clean LED is on solid, or comes on frequently.	Drive failure	Go to Step 009 on page MAPS-23.

**001**

(From page MAPS-21)

You are here for **one or more** of the following reasons:

(Step **001** continues)

**001** (continued)

The machine does not recognize the fact that it is a library machine.

The library never calibrates itself at Power-on.  
(Step **001** continues)

## Other Obvious Symptom Problems (continued)

### 001 (continued)

The Library Operator Panel Display has only two dark lines displayed.

With power on the device, inspect the library LEDs, the drive fan that exhausts through the rear of the device, and any other part you can see, hear or feel (the drive LEDs are visible through the priority cell), to ensure that power is on.

#### Is some power on in the device?

Yes No

002

This is a power problem that is handled by another MAP. Go to "Power Problems: MAP" on page MAPS-13 and continue isolation.

003

Power appears to be OK in the device.

Perform the following remove procedures:

"Library Chassis Covers" on page CARR-4.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the failing drive in the order listed:

Drive logic card (55%)

Library control card (35%)

Mother board (5%)

Library interface cable (5%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

004

(From page MAPS-21)

(From page MAPS-21)

You are here for **one or more** of the following reasons:

Three LEDs of a drive stay on all the time.

A drive appears to be hung.  
(Step **004** continues)

### 004 (continued)

The library appears to be hung.

The library operator panel display has a *Recovery Started* message, but the device appears to be hung.

#### Is this a library machine?

Yes No

005

Perform the following removal procedures:

"Decorative Cover—Drive-Only Models" on page CARR-5.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

This is a drive-only device without a library.

Replace the following FRUs in the order listed:

Drive logic card (45%)

Drive servo card (45%)

Mother board (4%)

Drive LED card (4%)

Drive sensor cable (2%)

When the repair is complete, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

006

This is a library machine. Inspect the drive LEDs with power on. They should all go on for awhile, then go off or flash.

#### Are any drive LEDs on solid continuously?

Yes No

007

Drive LEDs are working correctly. The problem must be only with the library LEDs.

Perform the following remove procedures:

"Library Chassis Covers" on page CARR-4.

"FID B2: Cooling Pack" on page CARR-12.

(Step **007** continues)



**007** (continued)

“Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed:

Library control card (90%)

Library sensor cable (6%)

Library LED card (2%)

&Flda2 (2%)

When the repair is complete, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**008**

Perform the following removal procedures:

“Decorative Cover—Drive-Only Models” on page CARR-5.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the failing drive in the order listed:

Drive logic card (45%)

Drive servo card (45%)

Mother board (4%)

Drive LED card (4%)

Drive sensor cable (2%)

When the repair is complete, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**009**

(From page MAPS-21)

(From page PROC-28)

You are here because a drive Clean LED is on solid, or comes on too frequently.

**Does the Clean LED in the failing drive act the same with different tape cartridges?**

**Yes No**

**010**

(Step **010** continues)

**010** (continued)

The problem is likely a defective or worn-out tape cartridge. Install a cleaner cartridge into the failing drive and perform a clean cycle. If this does not improve the situation, ask your customer to retire that tape cartridge and begin to use another one. Go to “End of Call” on page PROC-15.

**011**

The failure is probably not caused by any one tape cartridge.

**Does a Clean LED stay on all the time?**

**Yes No**

**012**

When a drive has been cleaned, a record of the cleaning is saved in non-volatile memory (which is updated once every 8 hours). If the drive has been cleaned but is powered off before the cleaning is recorded in non-volatile memory, the record of the drive cleaning is lost and the drive may require cleaning again when it is powered on.

To force the non-volatile memory to be updated immediately (instead of waiting for the 8 hour update), select the save statistics menu option after cleaning the drive. The save statistics option is reached from the Operator Options menu by selecting SERVICES, and then STATISTICS.

Too frequent clean requests may be caused by too many errors occurring during R/W operations. Ensure that the customer cleaner cartridge is not worn out. If it has not been replaced recently, you may want to try cleaning the failing drive with a new cleaner cartridge. If this does not fix the problem, do the following:

Perform the following removal procedures:

“Decorative Cover—Drive-Only Models” on page CARR-5.

“FID B2: Cooling Pack” on page CARR-12.

“Drive Assembly Top Cover” on page CARR-16.

(Step **012** continues)

## Other Obvious Symptom Problems (continued)

### 012 (continued)

Now replace the following FRUs in the failing drive in the order listed:

Head-actuator assembly (30%)

Drive analog card (20%)

Drive logic card (20%)

Drive servo card (20%)

Mother board (10%)

When complete, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

### 013

There may be a failure to reset the Clean LED. Power off/on the device and observe the Clean LED. It should come on solid, then go off while the drive microcode performs the bring up tests.

#### Does the Clean LED go off after coming on for a short time during bringup?

Yes No

### 014

The Clean LED is on solid. It may not be getting a reset from the electronics.

Perform the following removal procedures:

"Decorative Cover—Drive-Only Models" on page CARR-5.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the failing drive in the order listed:

Drive LED card (30%)

Drive servo card (20%)

Drive logic card (20%)

Mother board (20%)

Drive sensor cable (10%)

When complete, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

### 015

The Clean LED does go off. This is normal operation. The LED is not on solid at this time. The problem may have gone away for now. If the problem comes back, do the following:

Perform the following removal procedures:

"Decorative Cover—Drive-Only Models" on page CARR-5.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the failing drive in the order listed:

Drive logic card (40%)

Drive servo card (40%)

Mother board (10%)

Drive sensor cable (10%)

When complete, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

### 016

(From page MAPS-21)

You are here because your library device does not recognize that one or more magazines are installed.

During calibrate, the library should sense that a magazine is present and then inventory the cartridges that are in the magazine. It should then mark each cartridge present or absent on the library operator panel display. With the current failure on the machine, the library device is not able to sense the presence of the magazine, with or without tape cartridges installed.

#### Does the machine fail to recognize both magazines?

Yes No

### 017

Only one magazine is not recognized. Inspect the failing magazine lock lever and ensure that it is not broken, and that it is in the locked position. If it is in the locked position, do the following:

Perform the following remove procedures:

- “Library Chassis Covers” on page CARR-4.
- “FID B2: Cooling Pack” on page CARR-12.
- “Drive Assembly Top Cover” on page CARR-16.

Now replace the following FRUs in the order listed:

- Magazine 2 sensor (left) or Magazine 1 sensor (right) (90%)
- Library sensor cable (4%)
- Library control card (2%)
- Drive logic card (2%)
- Library interface cable (1%)
- Mother board (1%)

When repairs are complete, go to “Verify Fix” on page PROC-9 then go to “End of Call” on page PROC-15.

**018**

Neither magazine is recognized as being installed. Inspect the failing magazine lock levers and ensure that they are not broken, and are in the locked position. If they **are** in the locked position, do the following:

Perform the following remove procedures:

- “Library Chassis Covers” on page CARR-4.
- “FID B2: Cooling Pack” on page CARR-12.
- “Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed:

- Library control card (40%)
- Drive logic card (40%)
- Mother board (5%)
- Library interface cable (5%)

When repairs are complete, go to “Verify Fix” on page PROC-9 then go to “End of Call” on page PROC-15.

**019**

(From page MAPS-21)

You are here because your library device does not recognize that a cartridge is in the priority cell. (Step **019** continues)

**019** (continued)

Inspect the cartridge and ensure that it is far enough into the priority cell to be detected.

**Was the cartridge in far enough to be detected?**

**Yes No**

**020**

The cartridge not being installed far enough into the priority cell was probably the problem. Go to “End of Call” on page PROC-15.

**021**

Sensing of the cartridge in the priority cell is failing.

Perform the following remove procedures as needed:

- “Library Chassis Covers” on page CARR-4.
- “FID B2: Cooling Pack” on page CARR-12.
- “Drive Assembly Top Cover” on page CARR-16.

Replace the following FRUs in the order listed:

- Priority cell cartridge-present sensor (60%)
- Drive logic card (15%)
- Library control card (15%)
- Mother board (5%)
- Library sensor cable (5%)

When repairs are complete, go to “Verify Fix” on page PROC-9 then go to “End of Call” on page PROC-15.

**022**

(From page MAPS-21)

You are here for one of two reasons:

- The drive appears to hang during bring-up.
- The library appears to hang during bring-up.

Observe the power supply fan and the drive pack fan in each drive installed in this device. They should all be on with power to each drive. (Step **022** continues)

## Other Obvious Symptom Problems (continued)

022 (continued)

**Are all fans running?**

Yes No

023

Continue isolation at "Power Problems: MAP" on page MAPS-13.

024

Power to the fans is OK.

**Are you here because a drive may be hung?**

Yes No

025

The library may be hung.

With power-off, perform the remove procedure at "Library Chassis Covers" on page CARR-4.

Now that you have access to the cable that runs from the power supply to the library control card, remove the end of the cable that is plugged into connector CD5. on the library control card. A diagram is located at Figure 14 on page MAPS-29. Power-on the device and measure for the proper voltages between the voltage pins and ground pins at the cable end that was removed from the library control card.

**Does the voltage check OK?**

Yes No

026

Replace the following FRUs in the order listed:

Power supply (80%)

Cable from the power supply to the library control card (20%)

027

Power is OK to the library control card. Observe the drive LEDs while powering off, then back on. They should all light for a short time, then go off, then the Maintenance LED should flash while the drive diagnostics are running.

**Did the drive LEDs all come on and stay on?**

Yes No

028

Perform the following remove procedures as needed:

"Library Chassis Covers" on page CARR-4.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the order listed:

Library control card (80%)

Library interface cable (10%)

Library sensor cable (10%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

029

Perform the following remove procedures as needed:

"Library Chassis Covers" on page CARR-4.

"FID B2: Cooling Pack" on page CARR-12.

"Drive Assembly Top Cover" on page CARR-16.

Replace the following FRUs in the order listed:

Drive logic card (55%)

Library control card (35%)

Mother board (5%)

Library interface cable (5%)

At the completion of repairs, go to "Verify Fix" on page PROC-9, then go to "End of Call" on page PROC-15.

030

A drive may be hung.

(Step 030 continues)

**030** (continued)

If this is a library model, perform the following removal procedures:

- “Library Chassis Covers” on page CARR-4.
- “FID B2: Cooling Pack” on page CARR-12.
- “Drive Assembly Top Cover” on page CARR-16.

If this is a drive-only model, perform the following removal procedures:

- “Decorative Cover—Drive-Only Models” on page CARR-5.
- “FID B2: Cooling Pack” on page CARR-12.
- “Drive Assembly Top Cover” on page CARR-16.

You now have access to the power cable going from the power supply to the mother board. Also, refer to Figure 15 on page MAPS-29 for a power diagram. Unplug the power cable from mother board at connector CD3, and power the device on. Check for the appropriate voltages at the cable pins shown in the referenced figure.

**Does power check OK at the cable end?**

**Yes No**

**031**

Power is missing at the cable. Replace the following FRUs in the order listed.

- Power supply (80%)
- Power cable from the power supply to the mother board (20%)
- At the completion of repairs, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**032**

Power to the mother board checks OK. Replace the following FRUs in the failing drive in the order listed.

- Drive logic card (80%)
- Drive servo card (10%)
- Mother board (5%)
- Drive sensor cable (3%)
- Drive LED card (2%)

(Step **032** continues)

**032** (continued)

When the repair is complete, go to “Verify Fix” on page PROC-9, then go to “End of Call” on page PROC-15.

**033**

(From page MAPS-21)

You are here because a drive-only device has a Maintenance LED on solid, but none of the other drive LEDs are on. This is an indication that the drive logic card has had a catastrophic failure.

Observe the power supply fan and the drive pack fan. They should both be running with power on.

**Are both fans running with power on?**

**Yes No**

**034**

The failure was probably caused by overheating of the drive logic card components.

**Is the power supply fan running?**

**Yes No**

**035**

Continue isolation at “Power Problems: MAP” on page MAPS-13. If the symptom continues after fixing the power problem, return to the beginning of this MAP and begin again.

**036**

The drive cooling fan must be failing. Replace the following FRUs in the order listed:

- Drive cooling fan (90%)
- Cable-drive fan to power supply (10%)

When the fan problem is corrected, check to see if the same symptom is on the machine that brought you here. If the machine is still failing the same way, replace the drive logic card card. (100%) Refer to “FID EA: Drive Logic Card” on page CARR-16 for the removal and replacement procedure.

## Other Obvious Symptom Problems (continued)

037

Since the fans are both running, the failure of the drive logic card is probably not caused by overheating. Replace the drive logic card. (100%) Refer to "FID EA: Drive Logic Card" on page CARR-16 for the removal and replacement procedure.

---

## Diagrams Referred to by MAPs

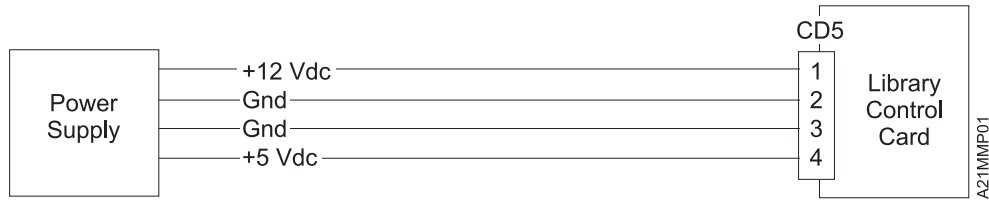


Figure 14. Library Electronic Power Diagram

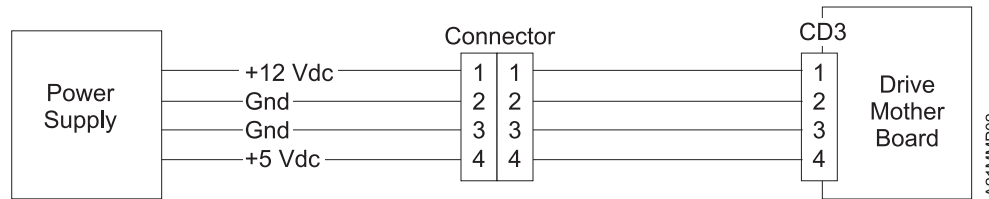
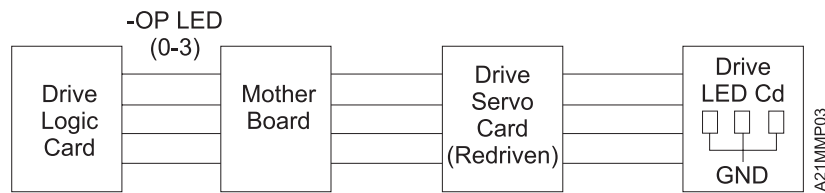
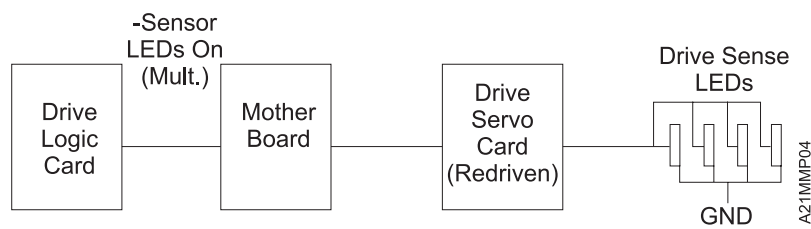


Figure 15. Drive Electronics Power



Note: One LED line not used

Figure 16. Drive LED Circuitry



Note: All drive sensor LEDs powered this way

Figure 17. Drive Sensor LED Circuitry





# Introduction

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## 3570 Introduction

### Product Overview

The IBM 3570 Tape Subsystem is a new family of tape handling products that provide high capacity, performance, and reliable tape cartridge processing, in a compact, low cost design. Designed for the mid-range systems, the 3570 attaches through the small computer system interface (SCSI) to systems like the AS/400, RS/6000, PC Server/Netfinity, HP, Sun and other OEM products that utilize the SCSI interface.

The IBM 3570 Tape Subsystem, B-Series Models are available in stand-alone and rack-mounted units, and with drive only models. The stand-alone and rack-mounted units come with a random access cartridge loader (Library) attachment which allows up to 20 tape cartridges per Library device. Multiple devices may be added to a single SCSI interface. These library models come with one or two drives.

For more information on models, see "IBM 3570 Tape Subsystem, B-Series Models" on page INTRO-5.

### New Technologies Save Time, Are More Reliable

The 3570, like the IBM 3590 High Performance Magnetic Tape Subsystem uses a newly introduced technology for longitudinal recording. In addition, the 3570 introduces a new, more reliable tape cartridge configuration that cuts in half the normal data acquisition time. The new technology and cartridge configuration can significantly increase the performance of longitudinal recording while considerably improving reliability.

### Broad Applications

The Library version of the 3570 can be used to provide low cost high availability of data that is usually archived or resides on relatively expensive disk media. This application allows backup data to be available within seconds without the need to have operator intervention and mount delays.

Another use is the automatic backup storage for midrange systems or servers which have large amounts of disk or need unattended storage capacity for multiple backups.

### Tape Cartridge Capacity

The IBM Magstar MP 3570 Tape Subsystem uses a metal particle tape and a new IBM Magstar Fast Access Linear Tape 3570 cartridge that can store 5GB of non-compacted data. The 3570 tape drive uses a compaction algorithm which can increase the storage capacity of these cartridge to 15GB.

**Data Compression:** The 3570 improved compression algorithm (IBMLZ1) provides highly efficient compression. The IBMLZ1 algorithm furnishes hardware execution efficiency by using as few machine cycles as possible to compress or decompress a byte, achieving good coding efficiency for broad applications, and performing compression without performance loss.

**Large On-line Capacity Available:** With 2 magazines of cartridges, each library can provide up to 300 GB of on-line data capacity with a data access rate of up to 20 GB/hr at a 3:1 data compaction ratio. Dual-drive models B02, B12 and B22 can provide up to double this data access rate (up to 40GB per hour at a 3:1 data compaction ratio). This, along with the fact that multiple library models may be attached to one SCSI attachment allows very large on-line storage capability for the cost conscious midrange computer user.

## A New Cartridge and Tape Movement Technology

The 3570 introduces a new concept for IBM tape drives that increases reliability along with faster data access. The 3570 drive, a key component of the 3570 Tape Subsystem, uses a new cartridge with a supply spool and a take-up spool. The normal start point for the 3570 tape is the physical mid point of the tape's length. As a result, to access data after the cartridge is loaded and has reached load point, the maximum distance it must travel is 1/2 the length of the tape, and the average distance is only 1/4 the length of tape. This reduced travel shortens data retrieval time and reduces head wear. Delays needed for tape load threading by other tape products is eliminated since the 3570 tape cartridge never needs to be threaded. When stationed at load point, which is near the center of the tape, the 3570 is ready to read or write data immediately in either direction.

## Interleaved Longitudinal Recording Technology

The 3570 Tape Subsystem reads and writes in a new 128-track format using the serpentine interleaved longitudinal recording technology, first introduced with the IBM 3590 High Performance Magnetic Tape Subsystem. All 3570 Bxx Models read and write 4 tracks at a time.

Writing and reading, with this improved methodology, along with beginning in the center of the tape, allows high speed data access at a very low cost.

The interleaved longitudinal recording technology allows the 3570 to write multiple tracks from the center of the physical tape to the end, in either direction, then index the head, or move the head vertically, for the return trip. The result is tracks interleaved across the width of the tape, from the center out in both directions.

The 3570 tape cartridge have a smaller profile than most other IBM tape products, and can not be interchanged with other products.

## Historical Comparison of Tape Technologies

See Figure 18 on page INTRO-5 for an explanation of the historical changes that have led to this new technology.

Historically, the 18 tracks recorded on 3480 media were used to record ECC information along with the data. The original base 3490 models also used the same 18-track format but were later enhanced in the 3490E models, which implemented two sets of 18 tracks. In the 3490E device the first 18 tracks are recorded when the tape moves in a forward direction until the physical end of the tape is reached. Then, using an electronic head switch (not physically moving the head itself in any direction but switching to a second set of read-write heads), a second set of 18 tracks is recorded when the tape moves in a backward direction until the physical beginning of the tape is reached.

In the 3590 a second generation of thin film magneto resistive (MR) heads is used, which, together with the 3590 tape medium allows recording with much higher area density, both in number of bits as well as number of tracks per inch. Similar to the 3590, the 3570 data is written in blocks of user data using multiple track format and where ECC information are recorded differently compared to the older track formats. The first set of four tracks is written from the halfway point along the length of the tape to near the end of the tape, where the head is indexed to the next set of four tracks for return to the tape center. The process continues until all 128 tracks are written. The process is repeated in the other direction of tape until the tape is full.

**Note:** Not all tape cartridges will be full from one end to the other. This example is used to show how a complete tape cartridge could be utilized for maximum effectiveness.

An example of tape track recording progression is shown in Figure 18 on page INTRO-5. The 3570 recording process is very similar to that of the 3590, but with fewer heads and with a two-reel cartridge.

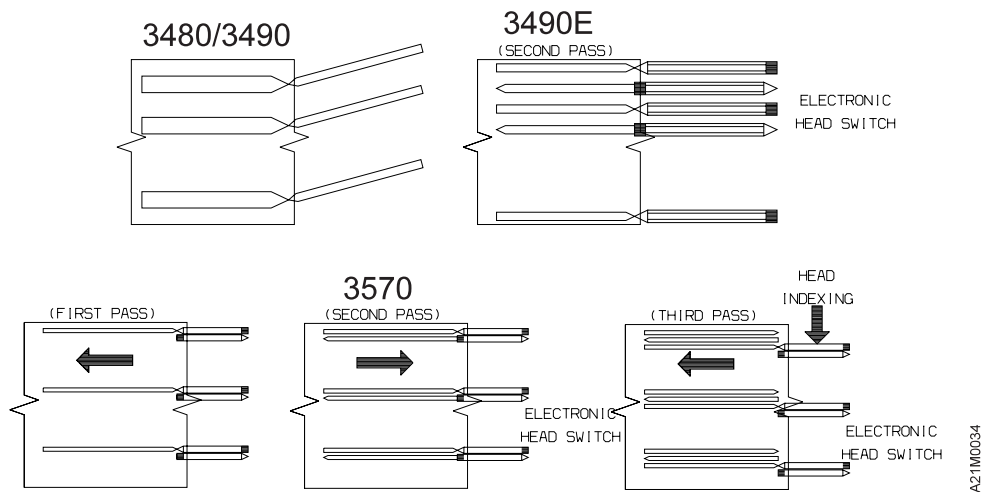


Figure 18. Serpentine Interleaved Track Sets

## IBM 3570 Tape Subsystem, B-Series Models

The following single drive 3570 models are available:

Model B00 Drive is a customer setup (CSU) Tape Subsystem which may be installed on a desk or table. It does not include the library attachment. See Figure 19 on page INTRO-6

Model B01 is a customer setup (CSU) stand-alone library Tape Subsystem with a 20-cartridge random access cartridge loader. See Figure 20 on page INTRO-7

Model B11 is a rack-mounted library tape subsystem with a 20-cartridge random access cartridge loader. The Model B11 is similar to the Model B01 except for external covers and being rack-mounted. See Figure 20 on page INTRO-7

Model B21 is a customer setup (CSU) rack-mounted library Tape Subsystem with a 20-cartridge random access cartridge loader. It is identical to a Model B11 except that it attaches only to IBM Netfinity or IBM PC Server systems, and is mounted in a EIA-310-D industry standard 19-inch rack such as the IBM Netfinity Rack (9306900) or NetBAY22 (9306200). See Figure 21 on page INTRO-8.

The following dual drive 3570 models are available:

Model B02 is a customer setup (CSU) stand-alone library Tape Subsystem with a 20-cartridge random access cartridge loader.

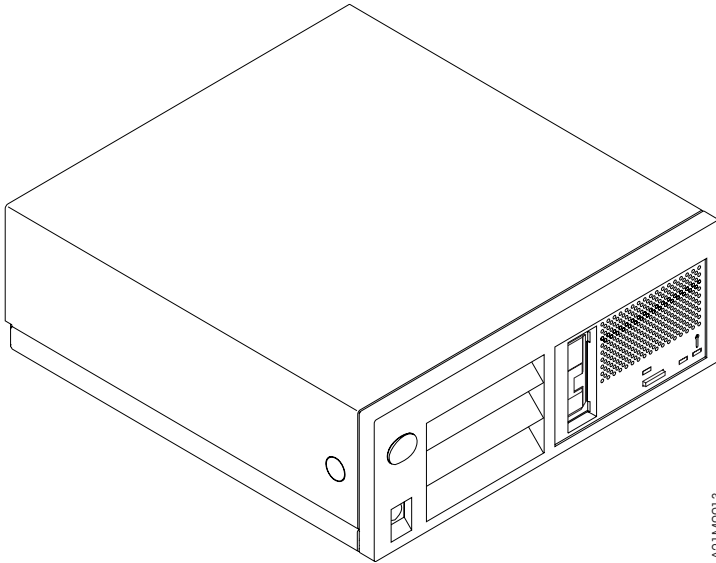
Model B12 is a rack-mounted library Tape Subsystem with a 20-cartridge random access cartridge loader.

Model B22 is a customer setup (CSU) rack-mounted library Tape Subsystem with a 20-cartridge random access cartridge loader that attaches only to IBM Netfinity or IBM PC Server systems, and is mounted in a EIA-310-D industry standard 19-inch rack such as the IBM Netfinity Rack (9306900) or NetBAY22 (9306200). See Figure 21 on page INTRO-8.

These devices operate as SCSI-2 devices with SCSI-3 features. The 3570 attaches to host processors through the 3570 SCSI system adapter, which is a 2-byte wide SCSI fast interface. It uses a SCSI-3 68-pin P connector.

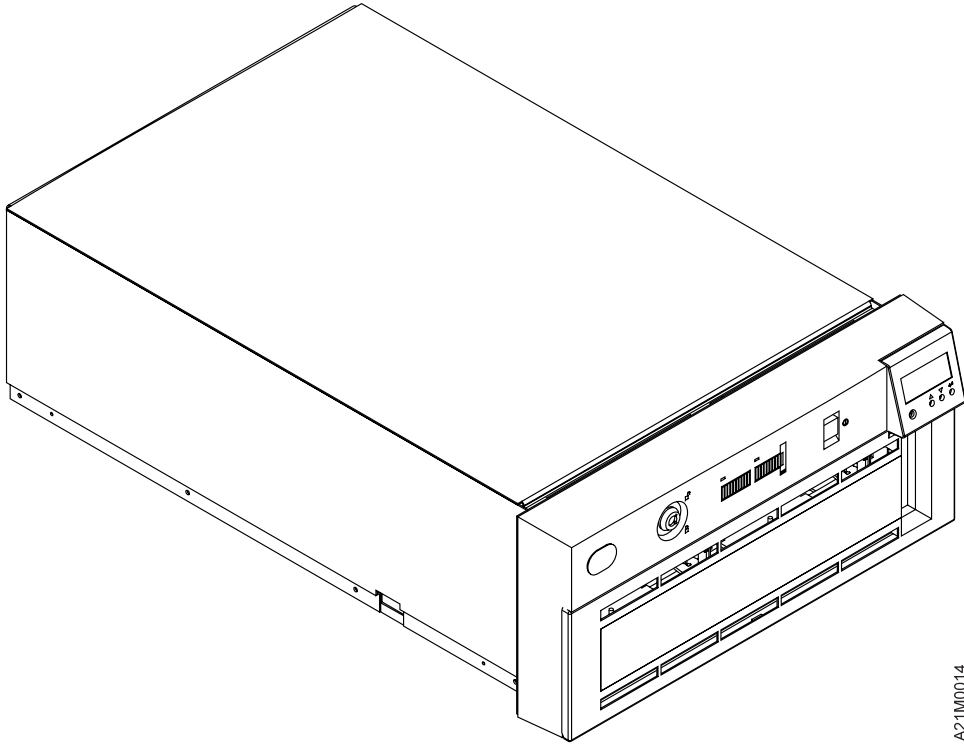
The 3570 can be integrated with any host system that supports a SCSI-2 interface and has the proper drivers installed.

An optional Bar Code Reader feature is available that can improve application performance for library models. When the host re-inventories the cartridges, it can take several minutes for the host to mount each cartridge in a drive and read the volume serial number identification from the tape in a full library. A bar code reader eliminates the need to load each cartridge in a drive. This feature can be installed on new or installed Magstar MP libraries and provides an efficient way to inventory cartridges in the library.



A21MD013

Figure 19. Model B00 Drive



A21M0014

Figure 20. Library Model B11 and B12



A21M0106

| *Figure 21. Library Models B21 and B22*



---

## Compatibility with Other Magstar MP Tape Subsystems

The Magstar MP B-Series tape drive can be distinguished from the Magstar MP C-Series tape drive by the color of the unload button on the drive from panel. The C-Series unload button is green; the B-Series unload button is blue.

The Magstar MP B-Format data cartridge can be distinguished from the Magstar MP C-Format data cartridge by the color of the file protect switch and Bar Code/Volser label, and also by the Volume ID printed on the label. The C-Format switch and label are green; the B-Series switch and label are blue. The C-Format Volume ID begins with a "G" (Gxxxxxx), and the B-Format Volume ID begins with a "F" (Fxxxxxx).

Only Magstar MP 3570 B-Format Tape cartridges can be written and read by Magstar MP 3570 B-Series Tape Subsystems.

The newer C-Format Tape cartridges can only be written, read and interchanged between Magstar MP 3570 C-Series Tape Subsystems and the Magstar MP 3570 Model C Tape Drives feature of the Magstar MP Tape Library Dataserver. The C-Format Tape cartridges cannot be used in Magstar MP 3570 B-Series Tape Subsystems or in Magstar MP 3570 Model B1A tape drives in a Tape Library Dataserver.

---

## Operating Systems

Refer to *IBM Magstar MP 3570 Tape Subsystem Introduction and Planning Guide, B-Series Models*, GA32-0348 for planning for program support.

---

## SCSI Physical Interface Characteristics

The 3570 Tape Subsystem operates as a SCSI-2 device with SCSI-3 features. The instruction set is SCSI-2, but includes SCSI-3 commands and mode sense data.

The 3570 Tape Subsystem attaches to host processors through the Magstar MP SCSI system adapter, which is a fast/wide (16-bit) differential SCSI interface. It uses a shielded high-density SCSI-3 68-pin P connector that accommodates 16 bus addresses. The 3570 attaches to a differentially driven, wide (16 bit) SCSI-3 P-cable.

Under the SCSI-2 protocol, this type of attachment allows cable lengths of up to 25 m (81 ft) with the appropriate cable and terminator selection. The stub length at each device must not exceed 0.2 m (0.66 ft). The 3570 Tape Subsystem also logically supports the narrow (8-bit) protocol. An interposer is required to connect the 3570 Tape Subsystem to a SCSI-2 bus.

**Note:** Only 8 bus addresses (0 to 7) are valid for an 8-bit SCSI bus.

## Bus Termination

The SCSI bus and all of the wires in the SCSI cable must be properly terminated according to the SCSI standard. This termination is especially important if a system mixes devices or initiators with 68-pin connectors with those of the older 50-pin style.

An external terminator may be mounted into a socket that is a part of the SCSI cable connector. A terminator must be installed on the last device on each end of a string of multiple devices. In a single-device installation, the terminator is installed in the socket of this device. The 3570 Tape Subsystem is delivered with an external differential terminator included, but it is not installed if the device is located in the middle of a SCSI string.

## SCSI Bus Jumper

| Models B02, B12 and B22 include a SCSI Bus Jumper, a short SCSI cable which is attached or removed  
| depending on the library configuration.

| **Base Configuration:** For Models B02, B12 and B22 set up in Base Configuration, the SCSI Bus  
| jumper is attached between the two drives so the drives are on the same SCSI bus.

| **Split Configuration:** For Models Models B02, B12 and B22 set up in a Split configuration, the SCSI  
| Bus Jumper is removed so each drive port is attached to a separate SCSI bus. Thus, each drive port in a  
| Split Configuration has the same cable and termination requirements as a single-drive model B01, B11 or  
| B21.

---

## Device Characteristics

Figure 22 shows the physical specifications of the 3570 Tape Subsystem.

*Figure 22. Physical Specifications*

Dimensions	Model B00	Model B01	Model B02	Model B11/B21 (rack-mounted)	Model B12/B22 (rack-mounted)
<b>Height</b>	112 mm (4.4")	217 mm (8.5")	217 mm (8.5")	217 mm (8.5")	217 mm (8.5")
<b>Width</b>	320 mm (12.6")	483 mm (19.0")	483 mm (19.0")	444 mm (17.5")	444 mm (17.5")
<b>Depth</b>	338 mm (13.3")	771 mm (30.4")	771 mm (30.4")	714 mm (28.1")	714 mm (28.1")
<b>Weight</b>	8.4 kg (18.5 lb)	35 kg (77.1 lb)	40 kg (88.2 lb)	24 kg (52.8 lb)	29 kg (63.9 lb)
<b>Weight with Pedestal</b>	8.5 kg (18.7 lb) (see note)	39.8 kg (87.7 lb) (see note)	44.8 kg (98.6 lb) (see note)	N/A	N/A
<b>Display Panel</b>	No	Yes	Yes	Yes	Yes
<b>Magstar MP Media</b>	One cartridge	Up to 20 cartridges	Up to 20 cartridges	Up to 20 cartridges	Up to 20 cartridges
<b>Tape Drives</b>	1	1	1	2	2

**Note:**  
Models B01 and B02 stand on a pedestal that raises each unit by 25 mm (1 in) above the floor or table surface.

## Orientation

Model B00 operates in two orientations:

Horizontal when the cartridge loader cell is vertical

Vertical when the cartridge loader cell is horizontal and the power switch is near the bottom.

All library models operate only in horizontal orientation, with slots arrayed vertically, and the priority cell on the right.

## Power Consumption

stand-alone Models:

60 watts nominal

Library Models:

70 watts nominal

## AC Distribution

AC power to the 3570 power supply is supplied from a wall outlet, rack enclosure, or other AC source.

**AC Input Voltages:** The 3570 power supply accepts input voltages and frequencies from 100 volts AC (nominal) to 240 volts AC (nominal), and from 50 Hz (nominal) to 60 Hz (nominal). The power supply automatically adjusts itself for proper operation when the voltages and frequencies are with the specification shown in Figure 23.

Figure 23. AC Input Voltages

Frequency	Frequency Tolerance	Input Voltage (VAC-RMS) Nominal	Input Voltage (VAC-RMS) Minimum-Maximum
50 Hz	±0.5 Hz	100 110 200 220 230 240	90–110 96.5–119 180–220 193–238 202–249 210–259
60 Hz	±0.5 Hz	100 110 120 127 200 208 220 240	90–110 96.5–119 104–127 111–137 180–220 180–220 193–238 208–254

**Power Cords:** A ship group provides the power cords needed to implement the electrical environment for the device. The power cords are 10-ampere line cords that provide either one-phase or two-phase power and ground, with an appliance coupler at the device end of the cord. The other end of the cord is determined by application and country and can be ordered by the customer.

See *IBM Magstar MP 3570 Tape Subsystem Introduction and Planning Guide, B-Series Models* for a list of part numbers of power cables by country.

**Power Control:** All 3570 models have a power-control switch located on the front of the devices. Input-power overload protection is provided by an automatic (reset) circuit breaker.

There is no power-on indicator on the device. All models have LEDs on the front. These LEDs are turned ON with power ON for a short time. The microcode turns OFF the LEDs after a checkpoint in the power-on self-test (POST). Library models have operator panels where power-on status is displayed after the LEDs have been turned OFF.

Remote power control is not the responsibility of the IBM 3570 Tape Subsystem. If required, it is provided by the enclosure or higher level subassembly.

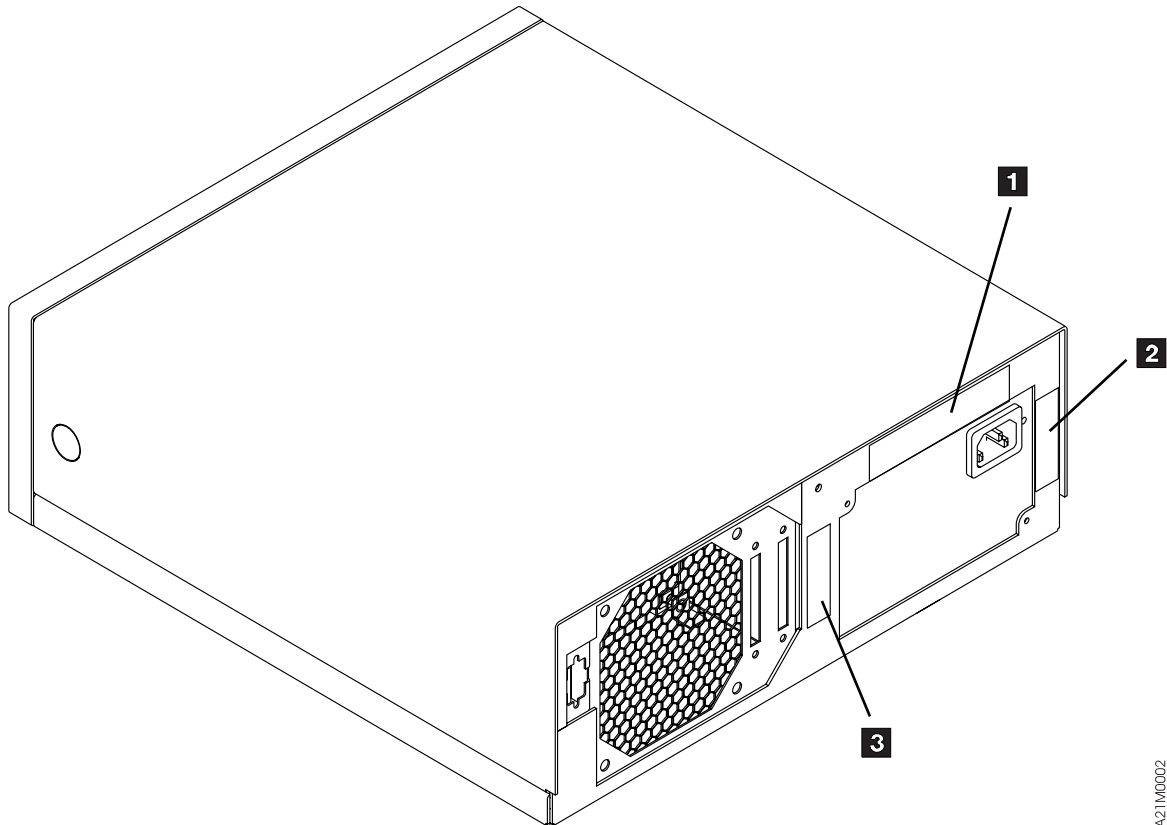
## Serial Number and Label Locations

See Figure 24. The following labels are installed on models without the library:

UL/CSA 1

Model and serial numbers with barcode and date of manufacture, item 2 .

EC label, item 3



A21M0002

Figure 24. Label Locations for Models Without Libraries

See Figure 25. The following labels are installed on Models with libraries:

Model and serial numbers with barcode and date of manufacture, item 1

EC label, item 2

UL/CSA 3

Weight label with a triangular symbol 4

**Note:** The serial number is also present above the left magazine lever opening on the front of the library.  
See item 14 in Figure 48 on page INTRO-44.

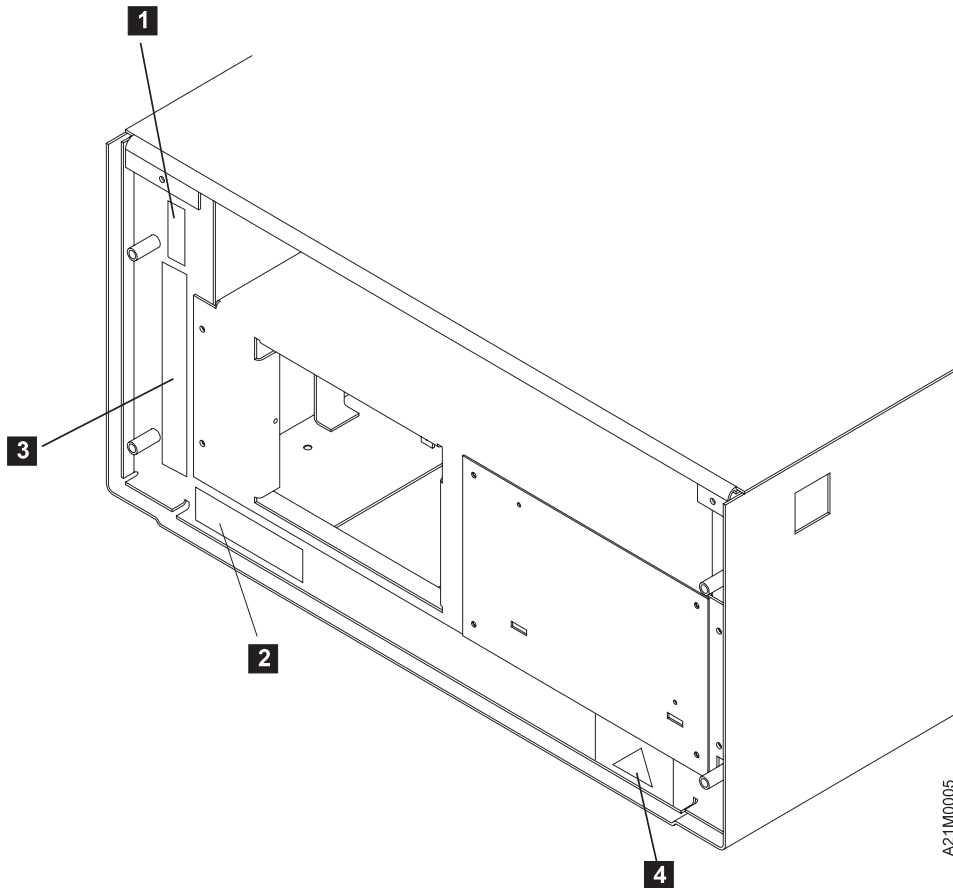
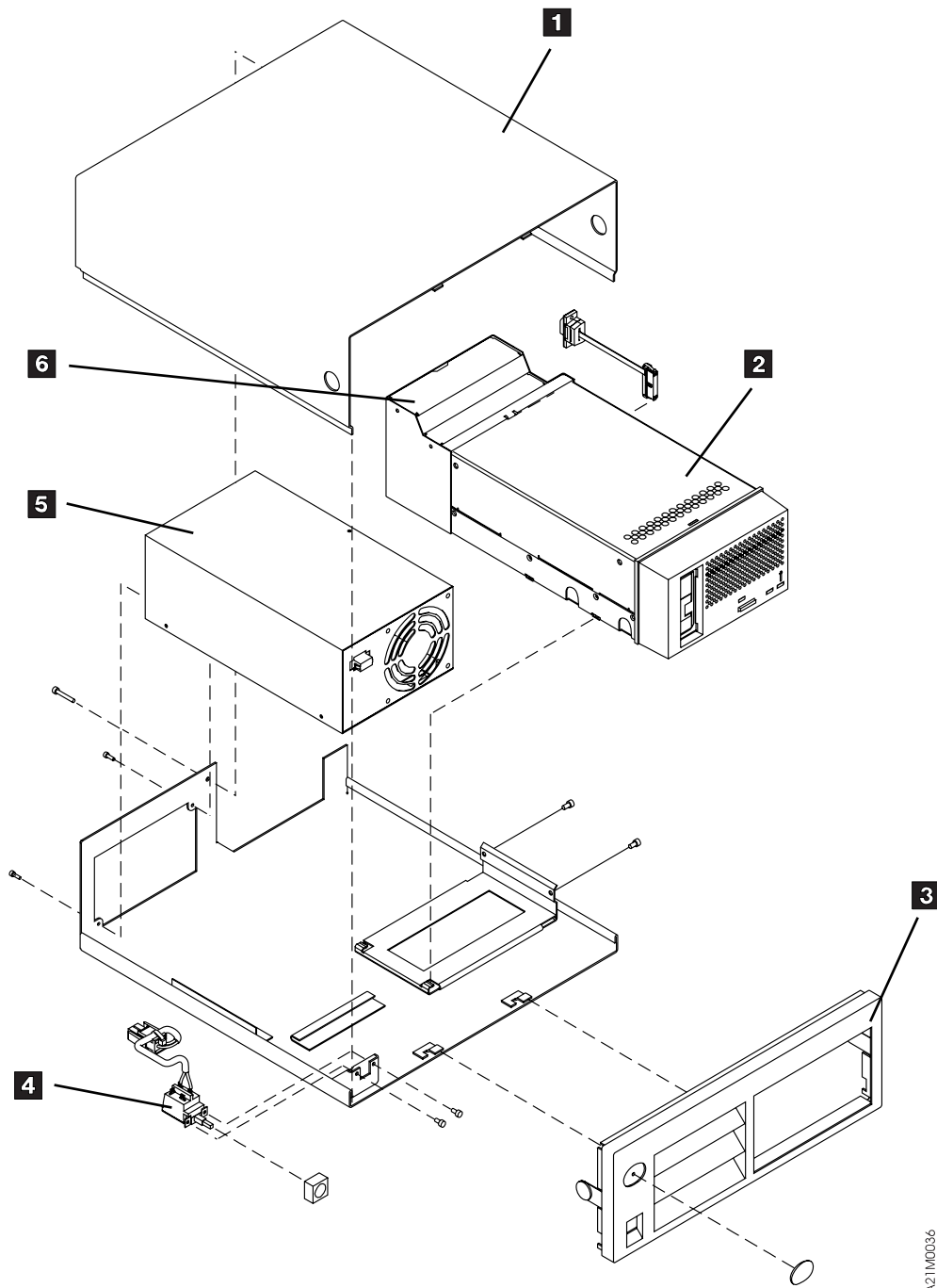


Figure 25. Label Locations for Models With Libraries

## Functional Unit Descriptions

For the following functional unit descriptions, it may be helpful to refer to the following tables for exploded views of several models or major components.

<i>Figure 26. Table of Exploded Views of Various Models</i>		
<b>Model/Part</b>	<b>Description</b>	<b>Figure Location</b>
Basic Drive Pack	Standard drive unit used in each model	Figure 29 on page INTRO-19
B00	Desktop drive W/O library attachment.	Figure 27 on page INTRO-16
B01	Stand-Alone Library version with one drive	Figure 30 on page INTRO-23
B11, B21	Rack-Mounted Library version with one drive	Figure 32 on page INTRO-25
B02	Stand-Alone Library version with two drives	Figure 31 on page INTRO-24
B12, B22	Rack-Mounted Library version with two drives	Figure 33 on page INTRO-26
<p><b>Note:</b></p> <p>The Models B01 and B11, and Models B02 and B12 are nearly identical except for external covers and where the devices are mounted. Model B11 and B21, B12 and B22 are nearly identical except for front bezel which is slotted, and operator display panel which is not slopped, to allow models B21 and B22 to fit further into mounting racks and not interfere with rack front door.</p>		



A21M0036

Figure 27. Model B00 Drive



## Power Supply

Each model of the 3570 has a power supply under its decorative cover that supplies power to the drive and also provides power to the Library when installed in a Library Model.

When the model has two drives, each drive will have its own power supply. In this case, the first power supply (located on the right side of the box facing from the front) provides power to its drive and the library.

Figure 27 on page INTRO-16 5 , Figure 30 on page INTRO-23 item 3 , and Figure 32 on page INTRO-25 2 show all three configurations where the single drive power supply is located.

Figure 28 shows the power distribution.

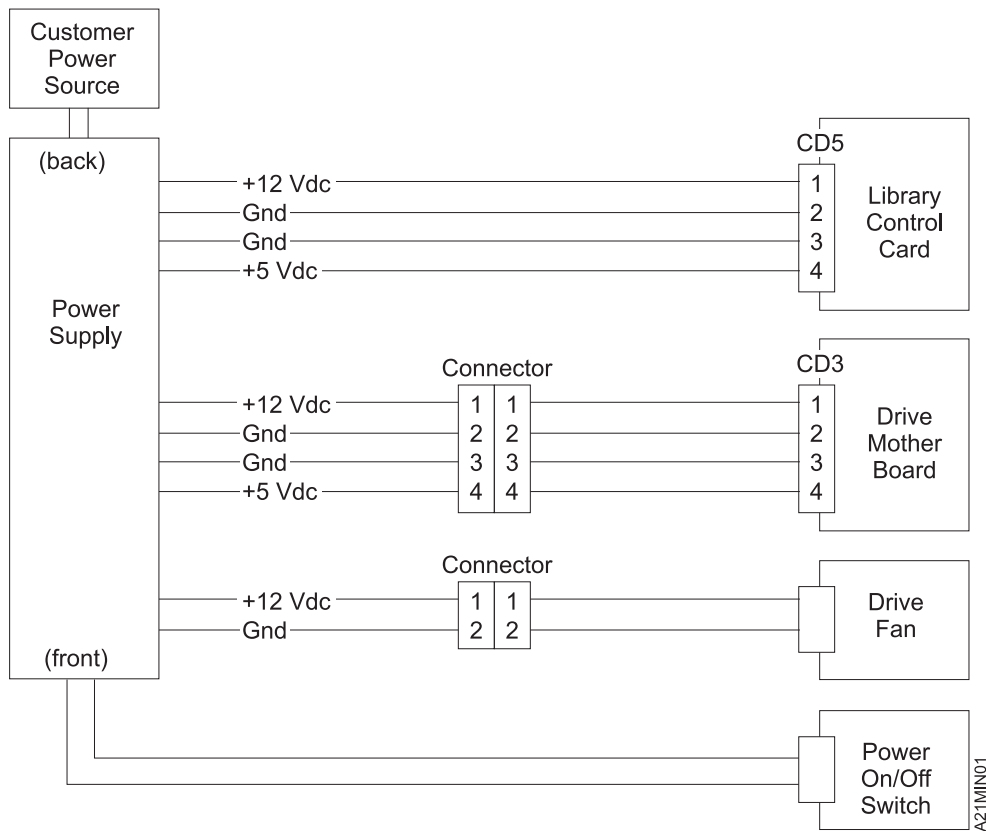


Figure 28. Power Block Diagram

## Drive Pack

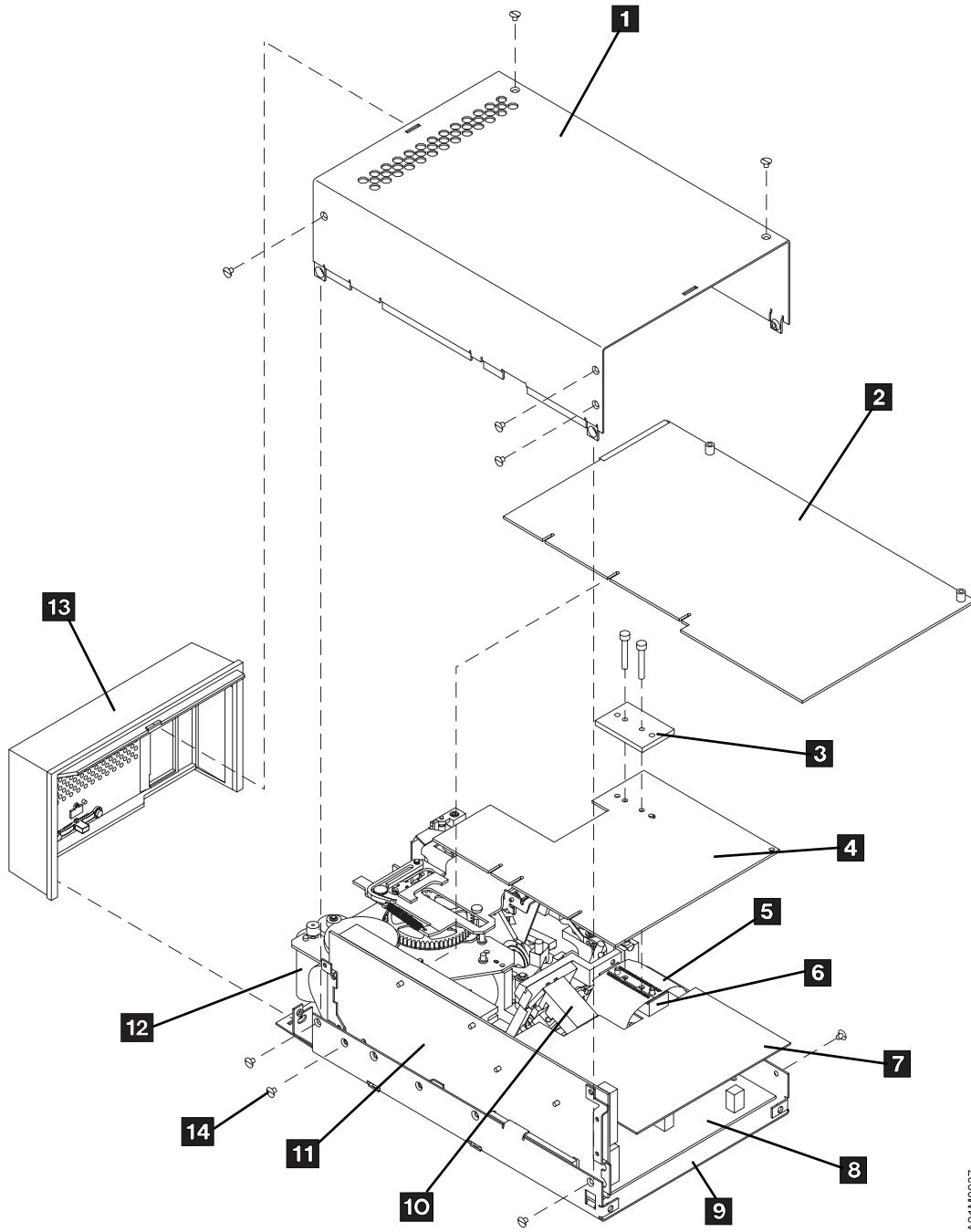
The 3570 drive pack has its own protective covers which must be removed to access the FRUs that are inside. The drive pack, shown in Figure 27 on page INTRO-16 2 , in the drive-only machine, and in Figure 30 on page INTRO-23 14 and Figure 32 on page INTRO-25 12 inside two single drive library machine configurations, is a stand-alone 5.25 inch form factor functional unit with a host SCSI interface. In addition to its own protective covers, it is always covered by external decorative covers, whether a stand-alone or rack-mounted device. Power and cooling are provided under the decorative covers as well. The Models B02 and B12 each contain two drive packs and two power supplies.

## Cooling Pack

Figure 27 on page INTRO-16 item 6 shows where the cooling pack is attached to the drive pack. All drive packs come with a cooling pack attached.

The cooling pack contains the drive cooling fan and the internal SCSI cable which plugs into the drive logic card. The cooling pack accepts the customer SCSI cable coming from the host system. The drive cooling fan and the internal SCSI cable are both FRUs. The cooling pack should be removed from the drive unit to more easily access the FRUs under the drive pack cover.

The FRUs contained within the drive pack are discussed below. See Figure 29 on page INTRO-19 for locations of all drive components discussed next.



A21M0037

Figure 29. Base Drive Components (All Models)

## Drive Logic Card Overview

The drive logic card, item 2 , contains the primary electronic controls for the drive and the library device, if installed. It is plugged into the mother board, item 11 , and is the first card visible when the top protective cover of the drive is removed. This card contains the SCSI controls for the box, several processors, memory buffers, clock generation circuits, and control logic for R/W data flow and reel to reel tape motion. It provides connectivity for the library function through the library control card.

### Drive Logic Card—How it works

The drive logic card, located in each drive pack, basically consists of a data path and a control path. The data path receives data from the SCSI bus, then buffers it, checks it for parity and CRC, compacts it, re-buffers it, formats it to fit the 3570 data format, and sends it to the drive analog card, and ultimately to the head-actuator assembly to be written to the media. In read-back, it receives read data pulses from the drive analog card, clocks them, de-skews them, corrects parallel data, buffers it, de-compacts it, and transfers the data to the SCSI bus.

The drive logic card contains the main microprocessor, the microcode load, clock generation circuits, reset controls, and control registers that interface with all other drive electrical/mechanical components.

**Library Models:** The drive logic card controls the motion of the accessor assembly and the picker assembly by sending commands to these devices through the library control card which performs as the library interface. The drive logic card also monitors tach pulses from the motors, and sense data from the various library sensors through the library control card interface.

**Host Communications:** The drive logic card serves as the primary SCSI interface for the device through a SCSI adapter and on-board SCSI drivers. All host communications to the 3570 go through the drive logic card via this interface. SCSI commands are received, and routed under microcode control throughout the device. SCSI data is received and sent as discussed earlier.

The SCSI ID switch is located on the drive logic card and is used to set the SCSI address for drive-only installations. The SCSI ID switch is not used on library models. The SCSI address on library models is set from the library operator panel display.

**Microcode:** Microcode, which is housed on the drive logic card, handles data and commands from the SCSI bus, and transfers data and controls the drive analog card, drive servo card, the loader assembly, head-actuator assembly, and the library components. During read from the media, the microcode controls the receiving and buffering of data from the drive logic card, and controls the actuator location in relation to the media. The microcode also provides communication to the operator or CE by communicating through the drive LEDs, the library operator panel display, and library LEDs. Bring-up diagnostics perform initialization and testing during Power On, and collects and presents error or ATTENTION data when intervention is required. Each installed drive contains microcode.

**Data Handling:** The drive logic card controls special compaction hardware to compact data before sending it out to be written to the tape media. During a tape read operation, data that is received from the R/W head is first corrected for skew, then is un-compacted and buffered for further transmission over the SCSI bus.

**Sense Gathering:** Sensing devices located in the drive pack send sense data through the drive servo card to the drive logic card. Sensing devices located in the library area send sense data through the library control card to the drive logic card.

**Drive Logic Card to Drive Analog Card Interface:** Most clocking for the 3570 is generated by the drive logic card. It operates at 40Mhz or clocks derived from this frequency. The microprocessor resident on the drive logic card runs at 20Mhz. The only off card use for drive logic card clock circuitry is a 20Mhz signal sent to the drive analog card during write operations and during transfer of LWR (Loop Write to Read) data. The library control card contains its own clock controls. During a write operation the drive logic card sends equalized write data and clock pulses to the drive analog card. During transfer of LWR data, the drive logic card clocks the LWR data from the drive analog card. The data is buffered and checked in both directions to ensure data integrity.

**Drive Logic Card to Drive Servo Card Interface:** The drive logic card is also the primary electronic source for controlling movement of the reel-to-reel motors, the head actuator, and readout of the loader sensors. The drive logic card provides control registers for each of these functions, which in turn are powered by the drive servo card to perform the actual movement of motors and solenoids. Feedback of tach pulses and sensors is transferred to the drive logic card from the drive servo card for processing by the microcode.

**Reset and Power Controls:** Power on reset for the 3570 is handled by the drive logic card. It checks power as it comes up or goes down, and provides reset levels to the other electronic circuits until power is at the proper levels. This *clamping* of the electronic cards keeps noise and glitches from occurring during power transitions.

## Drive Analog Card

The drive analog card, item 4, contains the write drivers, read preamplifiers and bias circuits for both data and servo channels. It provides precise switching of write current for four channels at a time to the R/W head during a write cycle, and detects and converts analog signals from the R/W head to digital signals during a tape read cycle. The drive analog card is designed and positioned so that it makes physical contact with the R/W head through thin film cable connections, item 5, yet can still be plugged into the mother board. The R/W head is part of the head-actuator assembly, item 1.

## Head-Actuator Assembly

The head-actuator assembly, item 1, contains the R/W head, and the actuator assembly, factory pinned. The entire unit is one FRU. The R/W head transfers write current as controlled by the drive analog card to the tape as it passes in contact with the R/W head during a write cycle, and transfers signals from the tape as it passes in contact with the R/W head during read cycles. The actuator assembly positions the head in the appropriate location to read or write across the width of the tape.

## Drive Servo Card

The drive servo card, item 8 provides circuitry that drives the loader motor, reel motors, and head actuator from signals originating in the drive logic card. It is the last card in the stack to plug into the mother board.

## Loader Assembly

The loader assembly, item 12, is mounted on the bottom plate, item 9. The loader assembly contains the mechanical and electrical components to move the tape cartridge into and out of the loader, to move the tape forward and backwards, to sense when the tape cartridge is in position to be read, and to sense the type of tape cartridge that is loaded. The loader assembly as attached to the bottom plate is one FRU. There are several smaller FRUs such as the loader door, drive LED card and the loader home sensor that

are also FRUs and may be replaced without replacing the entire loader assembly. When the loader assembly is replaced, all these FRUs are included in the assembly.

## **Drive Sensor Cable**

The drive sensor cable (not shown) is connected to numerous sensors and components on the loader assembly, and is replaceable without replacing the loader assembly. It attaches at the other end to the drive servo card.

## **Loader Door**

The loader door (not shown) is an integral part of the loader assembly, but may be replaced by itself if damaged.

## **Drive LED Card**

The drive LED card (not shown) is located near the front of the tape unit and provides circuitry that lights the Busy, Clean, and Maintenance LEDs for the drive and contains the Unload push button. This card has limited function in a library configuration.

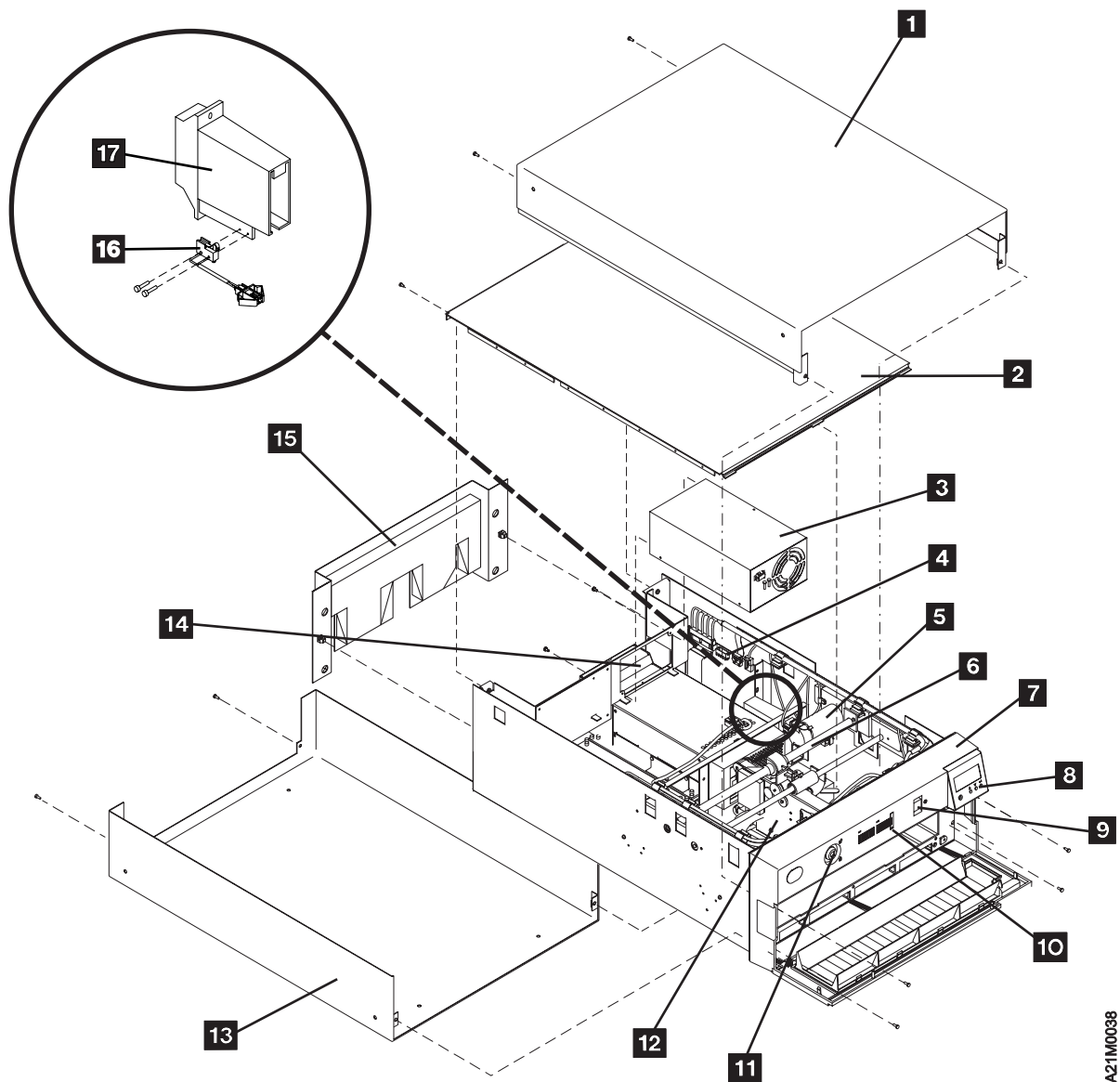
## **Internal SCSI Cable**

The internal SCSI cable is part of the cooling pack assembly and provides SCSI signal connectivity between the drive logic card and the host system cable connection point on the rear of the cooling pack.

## Library Components

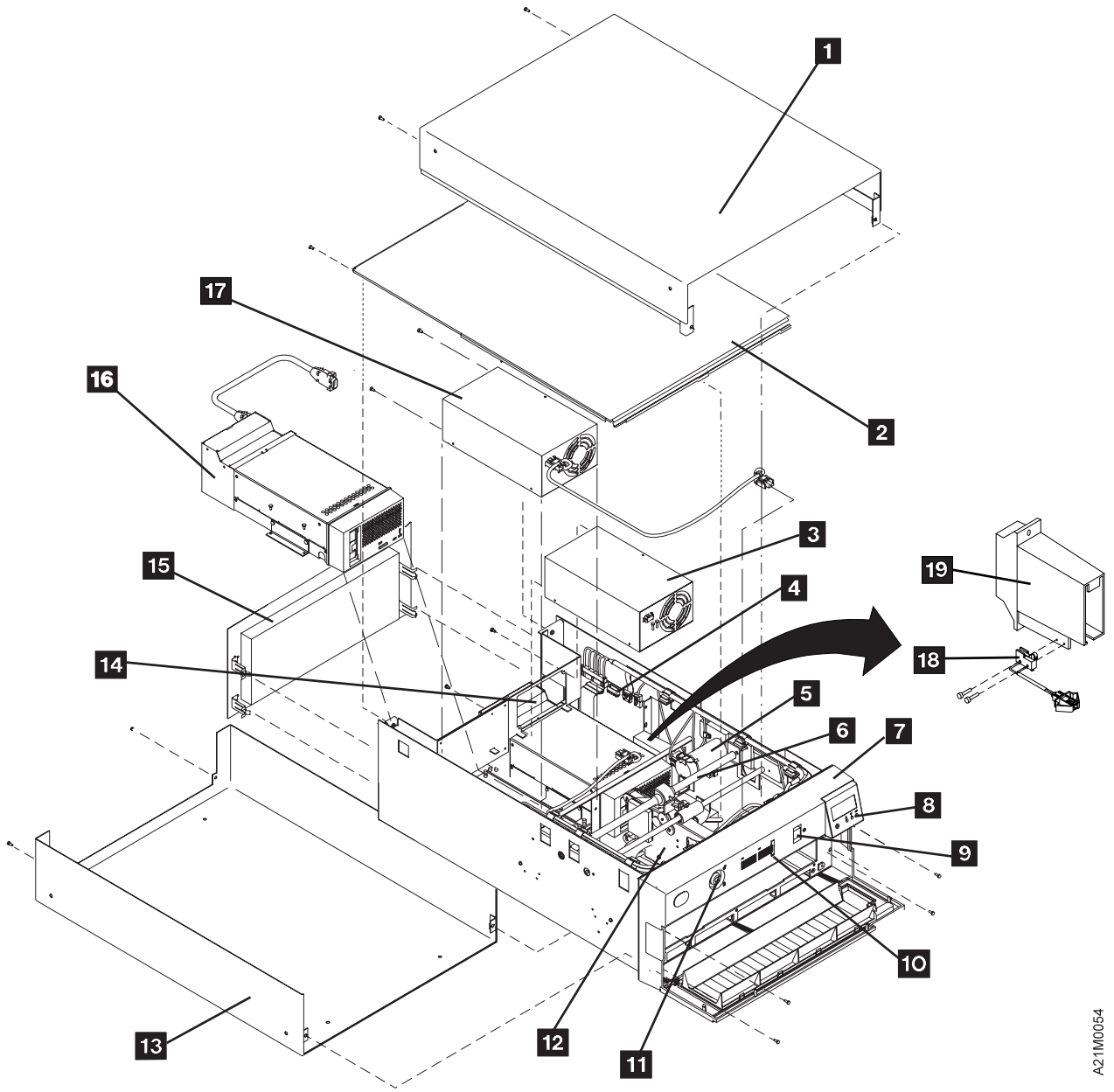
The library components are shown in Figure 30, Figure 31 on page INTRO-24, Figure 32 on page INTRO-25, Figure 33 on page INTRO-26, Figure 34 on page INTRO-27 and Figure 35 on page INTRO-28. They offer six models, all containing a 20 cartridge automated cartridge loader capable of operating in random, auto or manual access mode for tape volumes. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models GA32-0345* for location and functional description of the library. Each major component is discussed in detail in the LIBRARY section. They are shown here only for continuity.

Since the major difference between stand-alone and rack-mounted models is the external covers, and the major differences between single drive models and dual drive models is the number of drives and drive components, the following reverse key references are made only to Figure 33 on page INTRO-26.



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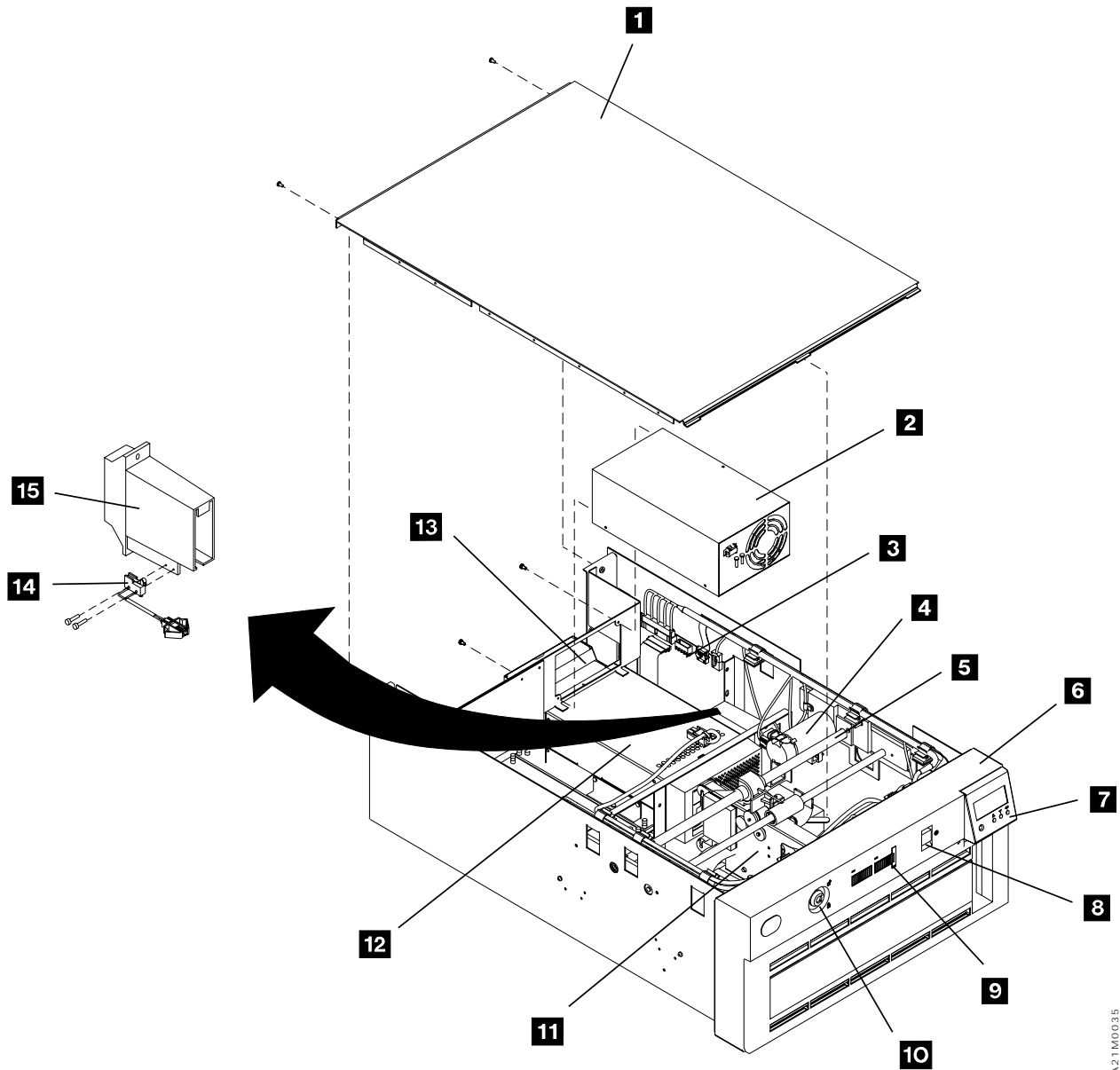
Figure 30. Model B01-Stand-Alone Library Model



A21M0054

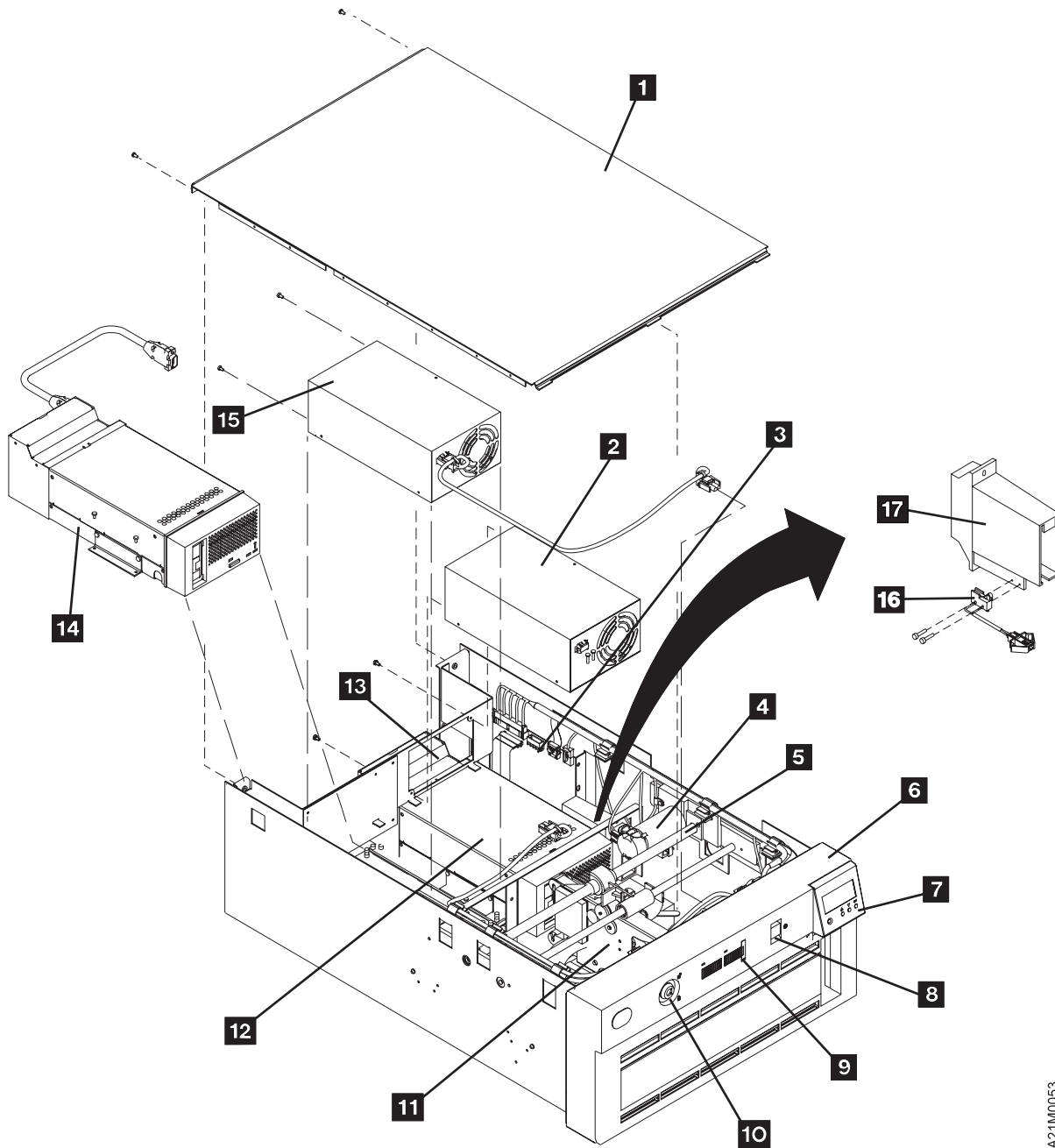
Figure 31. Model B02-Stand-Alone Library Model





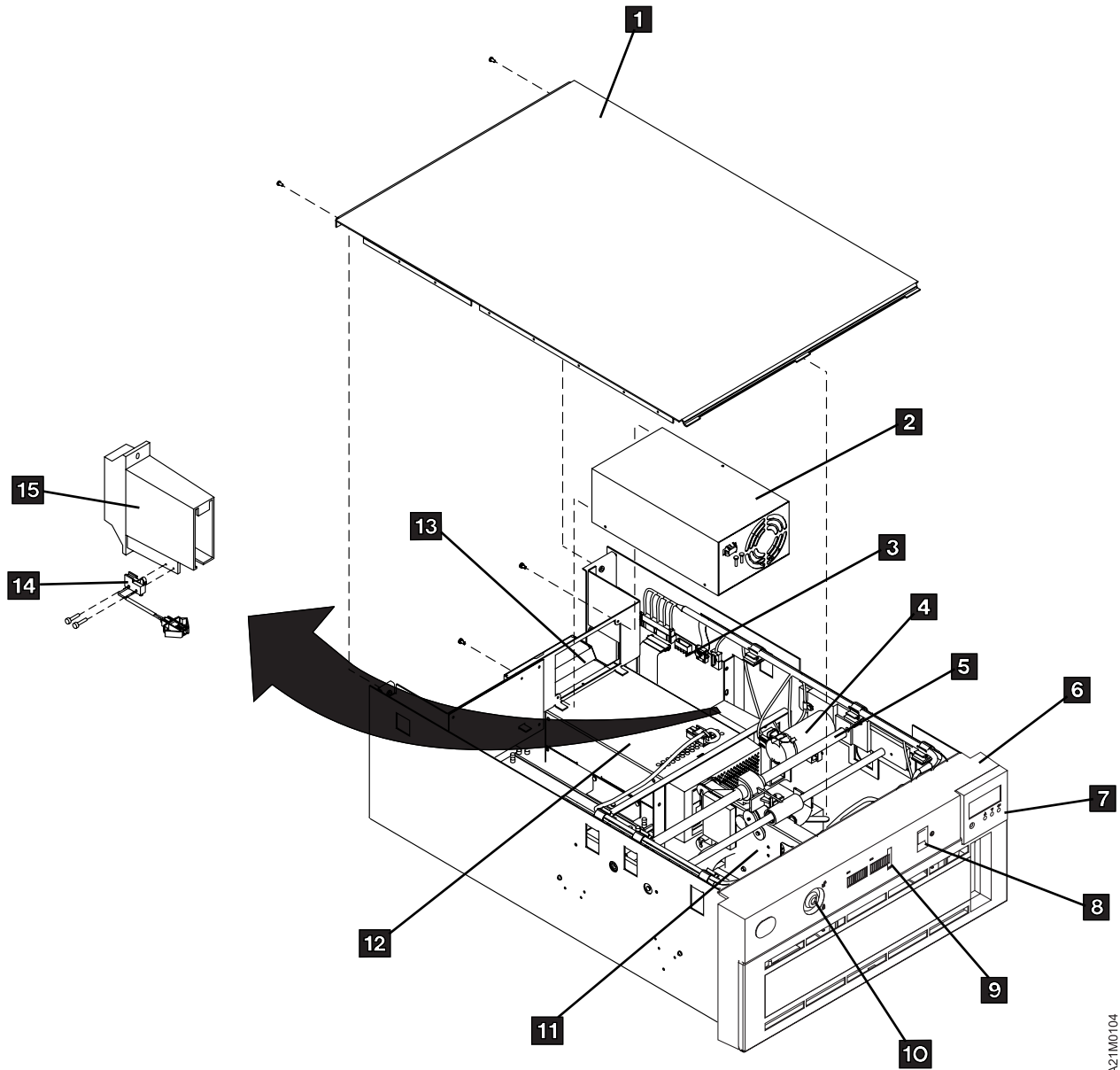
A21M0035

Figure 32. Model B11-Rack-Mounted Library Model



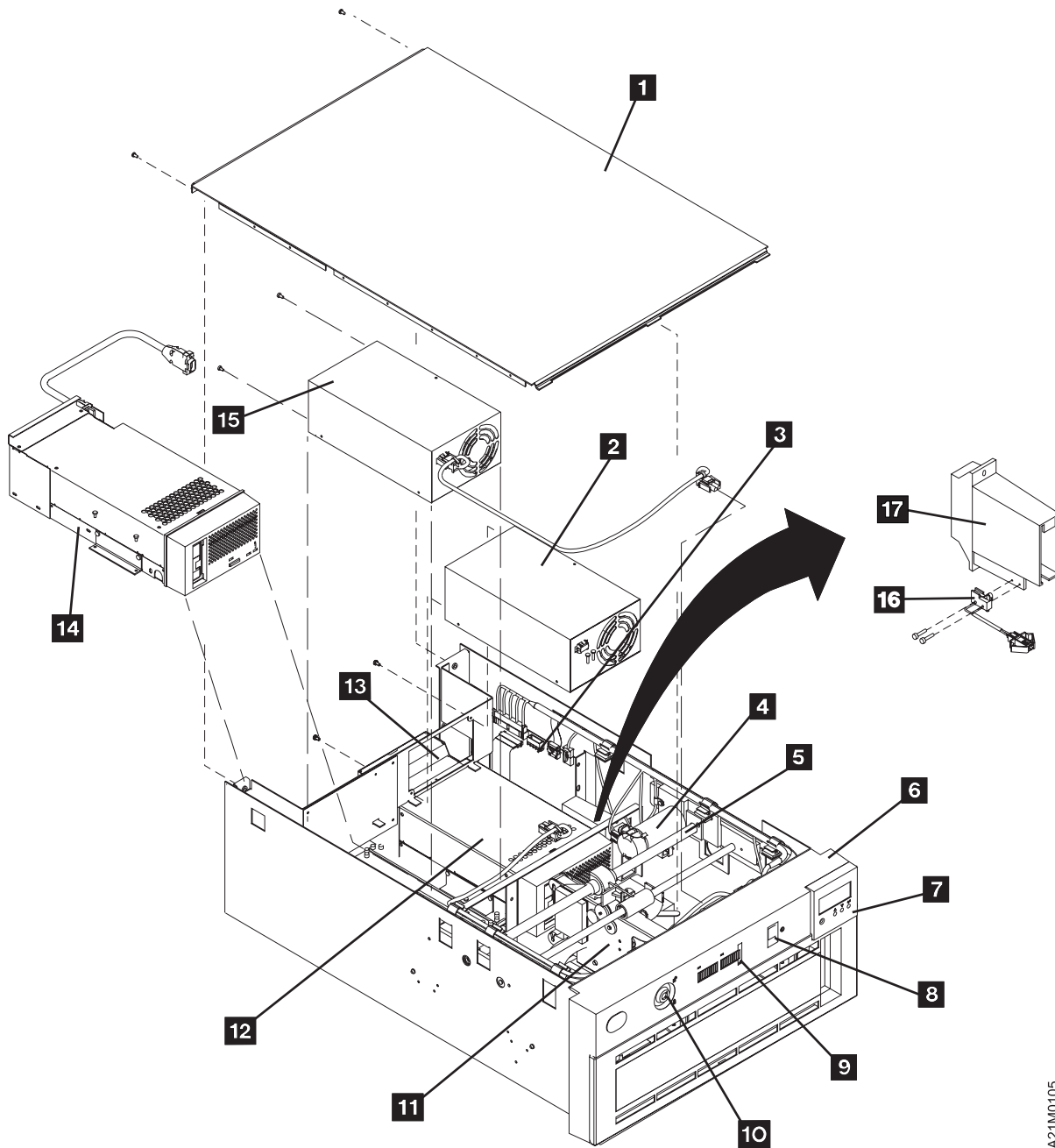
A21M0053

Figure 33. Model B12-Rack-Mounted Library Model



AZ1M0104

| Figure 34. Model B21-Rack-Mounted Library Model



A21M0105

| Figure 35. Model B22-Rack-Mounted Library Model

<i>Figure 36. Library Components</i>	
<b>Component</b>	<b>Key (Refer to Figure 33 on page INTRO-26)</b>
Top protective cover	1
Power supply (drive 1)	2
Library control card	3
Bar code reader (Optional)	3 (card mounted on library control card)
Accessor motor assembly	4
Accessor assembly	5
Library front cover assembly	6
Library operator panel display	7
Library AC switch and cable assembly	8
Library LED card	9
Security key lock	1
Picker assembly	11
Bar code reader (Optional)	11 (sensor mounted on picker assembly)
Drive pack (drive 1)	12
Cooling pack (drive 1)	13
Drive pack (drive 2)	14
Power supply (drive 2)	15
Cleaner cartridge- present sensor	16
Cleaner cell assembly	17
Library sensors and sensor cable	Not shown
Picker cable	Flat cable (not shown)
Library interface cable	Not shown.
Magazine global sensor pair	Not shown
Drive global sensor pair	Not shown
RS422 Drive-to-drive cable	Shown but not numbered (see rear of item 16 ).
<b>Note:</b> The Drive Pack, Power Supply and Cooling Pack for Drive 2 are found only in the Model B02, B12 and B22.	

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## 3570 Media and Cartridge

The 3570 Tape Subsystem uses a serpentine longitudinal recording technology called interleaved -longitudinal recording in a self enclosed tape cartridge. See Figure 37.

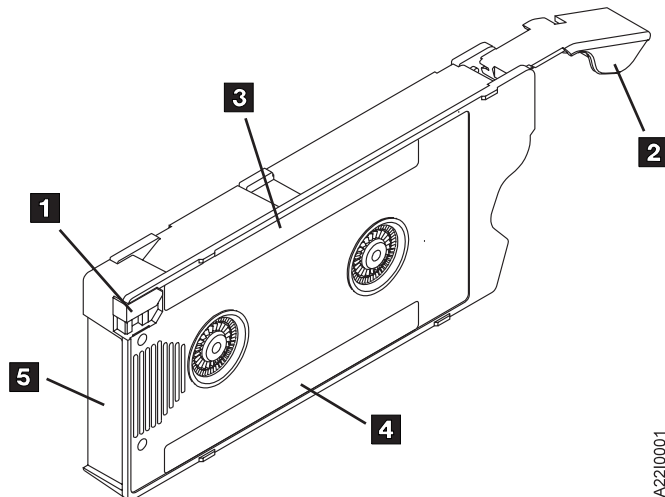


Figure 37. 3570 Fast Access Cartridge Data Tape

The automatic cartridge loader in the subsystem opens the cartridge door 2 and allows the cartridge to enter the tape path.

The cartridge remains closed during storage and handling to help protect the tape and tape path from external contaminants.

Each tape cartridge includes a file-protect selector, item 1 that, when placed in the upward position as indicated, prevents data from being written on or erased from the tape by a tape device.

Each data cartridge is identified by a factory-applied volume/serial (volser) number and a bar code. The volser and bar code appear on a label (see item 3 in Figure 37) along the edges of both the data and cleaning cartridges. Label, item 3 also has a small space in which the operator may write a note. An optional Bar Code Reader feature is available to read the bar code labels.

**Note:** Do not write on, mark over, or otherwise obscure either of the bar codes on a cartridge; doing so may cause the system to malfunction.

Another label is placed on the cartridge along the bottom of the plastic face (see item 4 in Figure 37). It is marked IBM Magstar MP Fast Access Linear Tape (or IBM Magstar MP Cleaning Cartridge in the case of a cleaning cartridge).

User-supplied labels should not be affixed to the cartridge because they may interfere with the proper handling of the cartridge in either the drive or the library transport mechanism.

Label, item 5 is located on the end of the cartridge, opposite the cartridge door, and contains a bar code identical to the one located on the top label.

If a cartridge label needs to be replaced, a kit containing enough labels for 10 cartridges can be ordered. See "Replacing Cartridge Labels" on page PROC-29 for more information.

No labels are permitted on the back aluminum surface, narrow top or bottom surfaces, nor the flip-up door end of the cartridge.

A series of **hole location positions** are designed into the plastic casing below the file protect lever. Absence or presence of holes in these location positions are sensed by the 3570 drive to determine the type of cartridge that is being loaded. The data and cleaning tapes each have three holes open, but they are located at different location positions. The hole positions are numbered from **bottom to top**, the top being #4 which is closest to the file protect lever.

Figure 38 summarizes the IBM Magstar MP Fast Access Cartridge Tape 3570 parameters.

*Figure 38. IBM Magstar MP Fast Access Cartridge Tape 3570 Cartridge Type*

Cartridge Type	Hole Position #1 (bot)	Hole Position #2	Hole Position #3	Hole Position #4 (top)	Accent Color	Label Print Color
B-Format	Closed	Open	Open	Open	Blue	Blue
C-Format	Closed	Closed	Open	Open	Green	Green
Cleaner	Open	Open	Open	Closed	Gray	Gray
Not Used	Open	Open	Open	Open	—	—
Not Used	Closed	Closed	Closed	Closed	—	—
Reserved	All Other Combinations	—	—	—	—	—

### 3570 Cleaner Cartridge

The need for cleaning the tape head is due to the presence of various debris elements that can accumulate on the read/write head surface over usage.

The 3570 cleaner cartridge, identified by the bottom label, and by gray colored accents on the file protect selector, contains a media that, when passed over the tape head, acts to remove foreign particles attached to the head. The surface also acts to attract the removed particles.

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## Library Attachment for Models B01, B02, B11, B12, B21 and B22

Devices with a 20-cartridge library attachment create an automation subsystem library capable of either random access of volumes for tape processing applications or sequential access of volumes for backup, restore, and scratch volume operations. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models*, GA32-0345 for location and functional description of the library.

The operating mode of the library can be selected by a SCSI command from the initiator or can be selected manually at the operator panel.

See Figure 39. The 20 cartridges for the library models are packaged 10 per magazine. Magazine 1, item 3 can contain 10 cartridges. Two of these magazines can be loaded into the subsystem at a time. The magazine is designed to provide for retention of cartridges in each of the 10 storage cells in two possible physical positions, the *Import* position or the *Export* position. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models*, GA32-0345 for a detailed description of magazine functions.

Library models have a priority cell that can be used to load or unload cartridges from the subsystem without removing the cartridge magazine. To use this feature, the last cartridge cell, item 2 in magazine 1 must be unused, that is, magazine 1, item 3 can contain only 9 cartridges (the right-most cell of magazine 1 must be empty). Magazine 1 must always be present to use the priority cell. Magazine 2, item 4 may contain up to 10 cartridges.

The operator panel, item 1 has a display and push buttons for operating the subsystem.

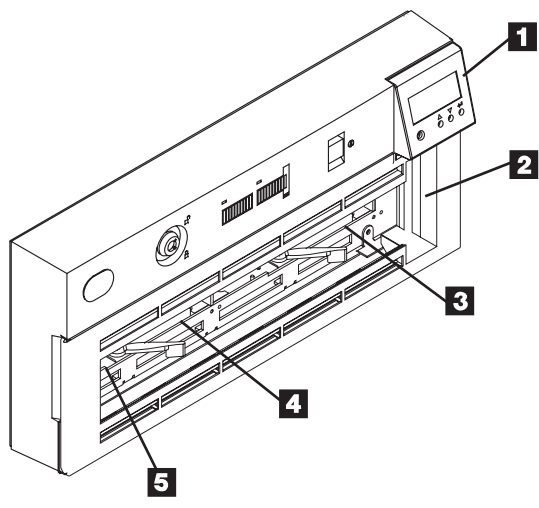


Figure 39. Magazine and Cartridge Locations for Library Models B01, B02, B11 and B12

## Library Magazine

See Figure 41 on page INTRO-34. The library can hold two 10-cartridge magazines, item 1. The magazine has two positions for each cartridge.

The cartridges are retained in either the import 2 or the export 3 position. The figure shows five cartridges in each position. This different positioning allows the operator to quickly see which and how many cartridges have been processed by the host system.



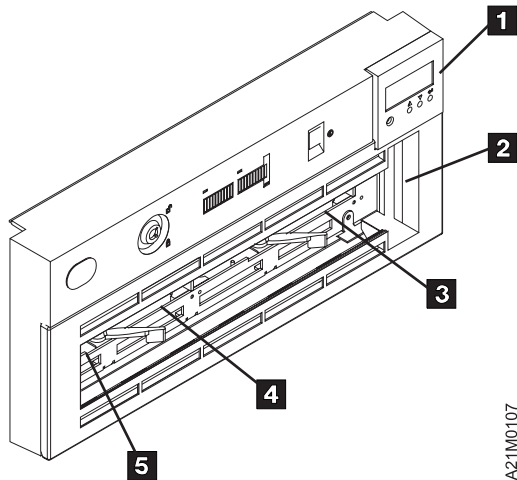


Figure 40. Magazine and cartridge locations, Models B21 and B22

**Import Position:** The operator puts the cartridge to the fully inserted position, which is flush with the edge of the magazine. In this position, the library transport has easy access to the cartridge, while the operator would have difficulty removing the cartridge.

**Export Position:** The library puts the cartridge in this position so that the cartridge is partially exposed to where the operator can remove these *processed* cartridges.

**Note:** In random mode, the library returns the cartridge to the import position for future re-use, unless the initiator has asked for the cartridge to be exported from the magazine, in which case the cartridge is placed in the export position in the priority cell.

Each magazine has a cartridge lock that is automatically unlocked when the magazine is secured in the library, thus making the cartridges easily accessible to both the operator and the transport. A thumb-operated slide mechanism allows the operator to temporarily unlock the magazine for cartridge removal and refilling. When the slide is released, the magazine automatically locks.

For random mode operation, magazine 1 (see Figure 39 on page INTRO-32) must be present to allow access to the priority cell. Requests for specific cartridges to be mounted can only be satisfied when magazine 1 is present in the library.

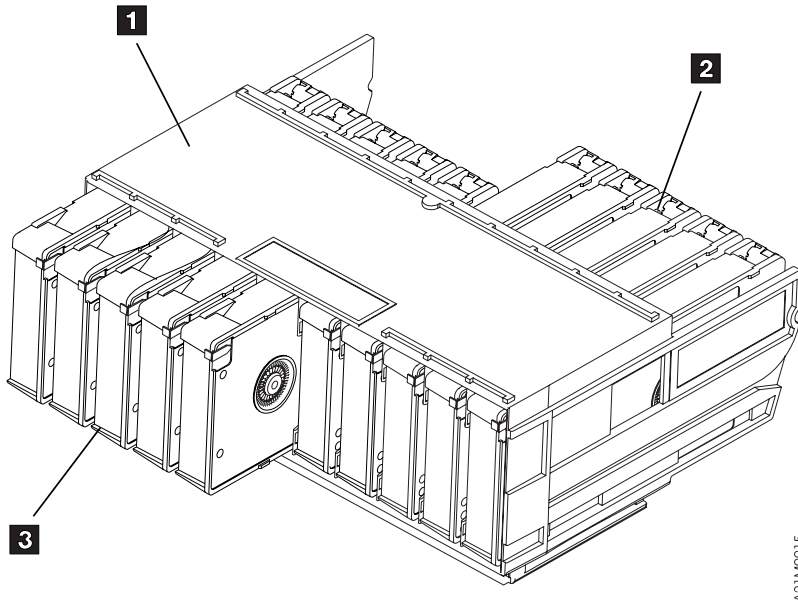


Figure 41. 3570 Cartridge Magazine

## Library Modes

The library is set to either automatic, random or manual mode. For an explanation of each, see the LIBRARY section.

## Library Configuration

The library is set to either base configuration or split configuration. For an explanation of each, see the LIBRARY section.

## System Attachment

### SCSI Addressing

The SCSI unit address is set during installation. See the INST section.

### SCSI Interface and Cable

A differential SCSI interface is offered. The SCSI interface cable connector is a 68 pin P-cable connector. When configured for SCSI, the 3570 subsystems are configured with one SCSI adapter.

The 3570 SCSI system adapter is a 2-byte wide SCSI fast interface. It uses a SCSI-3 68-pin P connector interface that accommodates 16 bus addresses.

### SCSI Features and Cables

The following section describes the feature codes for the RISC System/6000 and AS/400 systems (see Figure 42, Figure 43, Figure 44, and Figure 45).

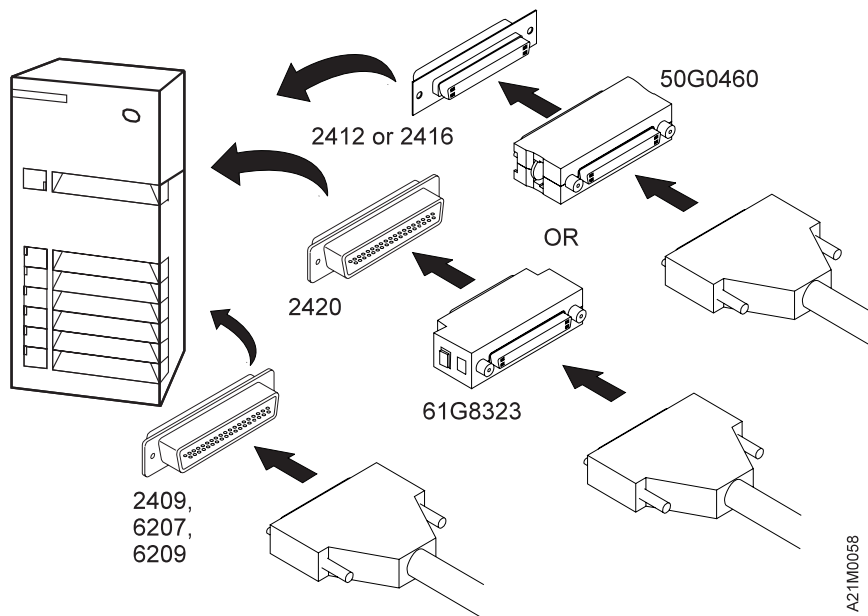


Figure 42. SCSI System Cable Attachment at the RS/6000 Host (Initiator)

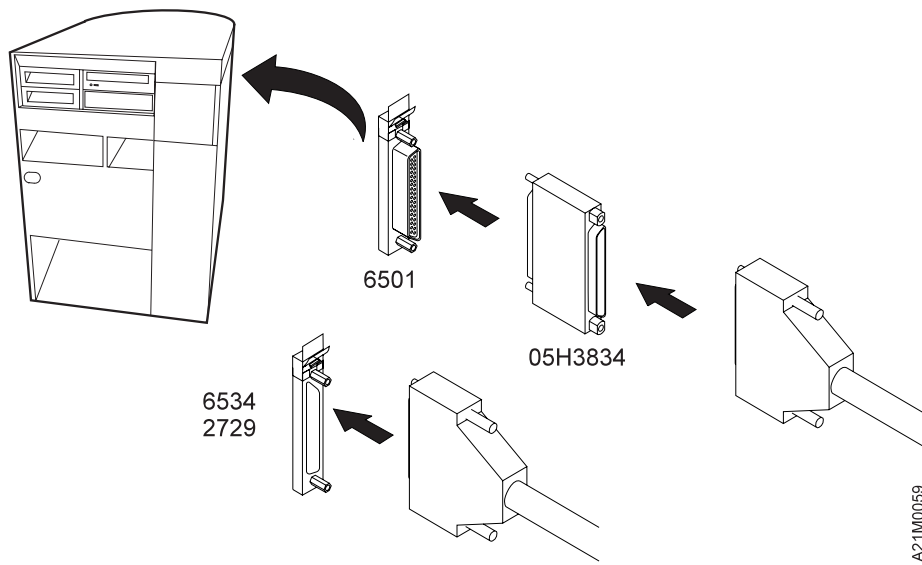


Figure 43. SCSI System Cable Attachment at the AS/400 Host (Initiator)

**Notes:**

1. For RISC System/6000, use the host-provided SCSI connectors at the host end to provide the daisy chain for multi-device applications.
2. For Models B02, B12 or B22 set up in the Base Configuration, use the supplied SCSI Bus Jumper to connect drive 1 to drive 2; select a single SCSI cable feature and a single interposer feature to attach the 3570 to one SCSI bus.
3. For Models B02, B12 or B22 set up in the Split Configuration, discard the supplied SCSI Bus Jumper and select 2 SCSI cable features and 2 interposer features for attachment of the 3570 to two SCSI busses.

*Figure 44. RISC System/6000 and AS/400 Interposers*

Host	Host Connection (Feature Codes Are for the Host)	Interposer P/N and Feature Code (Feature Codes Are for Magstar MP)
RS/6000	PCI SCSI-2 Differential Fast/Wide Adapter (FC 2409, identifier 4-B)	None required
RS/6000	PCI SCSI-2 Differential Fast/Wide Adapter (FC 6207, identifier 4-L)	None required
RS/6000	PCI SCSI-2 Fast/Wide Differential Adapter (FC 6209, identifier 4-B)	None required
RS/6000	SCSI-2 Differential Fast/Wide Adapter/A (FC 2416, identifier 4-6)	50G0460 (FC 2892)
RS/6000	Enhanced SCSI-2 Differential Fast/Wide Adapter/A (FC 2412, identifier 4-C)	50G0460 (FC 2892)
RS/6000	SCSI-2 Differential Fast/Narrow High-Performance External I/O Controller (FC 2420, identifier 4-2)	61G8323 (FC 2891)
AS/400	Magnetic Media Subsystem Controller (FC 6501)	05H3834 (FC 2895)
AS/400	Magnetic Media Subsystem Controller (FC 6534)	None Required
AS/400	Magnetic Media Subsystem Controller (FC 2729)	None Required
PC/Netfinity		None Required

*Figure 45. Magstar MP SCSI Cable Feature Codes*

Feature Code (for Magstar MP)	IBM Part Number	Cable Length
FC 5205	P/N 49G6456	0.5 m (2 ft)
FC 5212	P/N 49G6458	12 m (39 ft)
FC 5218	P/N 49G6459	18 m (59 ft)
FC 5225	P/N 08L6239	25 m (81 ft)
FC 5245	P/N 49G6457	4.5 m (15 ft)
PC/Netfinity	P/N 05H9527 (Models B21 and B22)	0.5m (2 ft)
PC/Netfinity	P/N 05H9651 (Models B21 and B22)	4.5m (15 ft)

**Notes:**

1. On RS/6000 systems, cable lengths greater than 18 m (59 ft) are not permitted with feature code 2420. Cable lengths up to 25 m (81 ft) can be used with feature code 2409, 2412, or 2416.
2. On AS/400 systems, cable lengths up to 25 m (81 ft) can be used with feature code 6501.

**RISC System/6000 Controller Feature 2409 or 6209:** Any combination of initiators and targets up to a total of 16 is allowed if:

The SCSI bus is terminated properly at each end.

Cable restrictions are followed according to SCSI-2 specification. With RISC System/6000 SCSI controller feature code 2409 or 6209, the maximum cable length is 25 m (81 ft). Figure 45 lists the available cables used to attach the Magstar MP Tape Subsystem to a RISC System/6000 system.

Multiple RISC System/6000 systems may be linked to the Magstar MP Tape Subsystem. For maximum performance, the Magstar MP Tape Subsystem may need to be the only target on the SCSI bus.

**RISC System/6000 Controller Feature 2412 or 2416:** An interposer, feature code 2892 (see Figure 44), is required to attach the Magstar MP Tape Subsystem to RISC System/6000 controller feature 2412 or 2416. Any combination of initiators and targets up to a total of 16 is allowed if:

The SCSI bus is terminated properly at each end.

Cable restrictions are followed according to SCSI-2 specification. With RISC System/6000 SCSI controller feature code 2412 or 2416, the maximum cable length is 25 m (81 ft). Figure 45 lists available cables used to attach the Magstar MP Tape Subsystem to RISC System/6000.

Multiple RISC System/6000 systems may be linked to the Magstar MP Tape Subsystem. For maximum performance, the Magstar MP Tape Subsystem may need to be the only target on the SCSI bus.

**RISC System/6000 Controller Feature 2420:** A 1-byte to 2-byte interposer, feature code 2891 (see Figure 44), is required to attach the Magstar MP Tape Subsystem to RISC System/6000 controller or RS/6000 SP feature 2420. If feature 2420 is used, the Magstar MP must be attached at the end of the SCSI bus. Any combination of initiators and targets up to a total of eight is allowed if:

A Magstar MP is the last device on the SCSI bus.

The SCSI bus is properly terminated at each end.

Cable restrictions are followed according to RISC/6000 requirements. With SCSI controller feature 2420, the maximum cable length is 18 m (59 ft). Figure 45 lists the available cables used to attach the Magstar MP Tape Subsystem to RISC System/6000.

Multiple RISC System/6000 systems may be linked to the Magstar MP Tape Subsystem. For maximum performance, the Magstar MP Tape Subsystem may need to be the only target on the SCSI bus.

**AS/400 System Feature 6501, 6534, or 2729:** An interposer, feature code 2895 (see Figure 44), is required to connect the Magstar MP 3570 Tape Subsystem to system feature 6501. No interposers are required to connect the Magstar MP 3570 Tape Subsystem to system feature 6534 or 2729.

The following condition applies to AS/400 9404 and 9406 SCSI bus attachment of system features to the Magstar MP Tape Subsystem:

Feature code 6501 provides two ports.

Feature code 6534 and 2729 each provide one port.

Each port can support one Magstar MP Tape Subsystem. Therefore, two subsystems may be attached.

No other devices can be supported on a feature 6501 port with the Magstar MP Tape Subsystem attached.

An AS/400 system cannot be interconnected with any other system (including another AS/400) on the same SCSI bus. See “Connecting the 3570 to Multiple Systems.”

When the subsystem is attached to AS/400 with features 6501, 6534, or 2729, one of the SCSI addresses on the Magstar MP must be set to 0 if the 3570 is to be used as an alternate IPL device.

Figure 45 lists the available cables of the proper length for attaching the Magstar MP Tape Subsystem to AS/400 with feature code 6501, 6534 or 2729.

**Hewlett Packard:** Requires 9000 Series servers running HP-UX, 10.01, 10.10 or 10.20. Other servers that support HP Precision Bus (HP-PB) fast/wide (F/W) Differential Adapter 28696A, with firmware revision 3543 or higher.

**Windows NT:** Requires Microsoft Windows NT version 4.0 with service pack 3 or greater on an Intel processor. Intel processors require an Adaptec 2944 fast/wide SCSI adapter, or equivalent.

**Sun Solaris:** Requires Solaris 2.3, 2.4, 2.51, and 2.6 for Sun and Sun Sparc. Requires SCSI-2 fast/wide differential adapter.

## Connecting the 3570 to Multiple Systems

**Note:** For two drive libraries the SCSI addresses of the drives must be different when connected to the same host. The only time two drives can have the same SCSI address is when connected to different hosts (split configuration).

**AS/400:** An AS/400 system cannot be interconnected with any other system (including another AS/400) on the same SCSI bus. Therefore, a Model B02 or B12 in a Split Configuration is the only 3570 Tape Subsystem that can be attached to an AS/400 system and another system at the same time (on separate SCSI busses).

**RS/6000:** Multiple RS/6000 systems may be attached to a 3570 Tape Subsystem.

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## Drive Indicators and Operator Controls

Model B00 Drive has an operator panel that has three LED indicators, one push button and a Power On/Off switch. See Figure 46 on page INTRO-41. See *IBM Magstar MP 3570 Tape Subsystem Operator's Guide*, GA32-0345 for location and functional description of operator controls and indicators. These elements are:

### 1 Power On/Off Switch

This switch is connected to the ac/dc power supply by a cable. The switch removes dc power from the output of the power supply. With the switch in the Off position, ac voltage is still available at, and inside the device power supply.

### **Note:** 2 Busy Indicator

This green LED provides a visual indication of tape motion and will turn on solid when tape is in motion for reading, writing, loading, and locating. This indicator flashes when the operator presses the Unload button to rewind/unload tape.

This indicator is also used in conjunction with the other two LED indicators to display maintenance conditions (see "Drive Indicators-Normal Operation for Drive-Only Models" on page START-10).

### 3 Unload Push Button

This blue push button allows the operator/CE to cause a loaded cartridge to be rewound to load point and unloaded from the drive. Pressing the Unload push button causes the Busy indicator to flash while the tape is rewinding. The Busy indicator turns off when the cartridge is unloaded.


This switch is also used in the maintenance procedure to select and execute the functional Read/Write diagnostic. See "Verify Fix" on page PROC-9 for diagnostic selection procedures.

### 4 Clean Indicator

This yellow LED is used to indicate to the operator that cleaning is required. When used for this purpose, the indicator will flash while the Busy and Maintenance indicators are off. A special cleaning cartridge is inserted to clean the tape head.

This indicator is also used with the other two indicators to display maintenance information to the operator or CE. See "Drive Indicators-Normal Operation for Drive-Only Models" on page START-10 for the other uses of this indicator.

### 5 Maintenance Indicator

The right-most of the three LEDs is a yellow indicator that is labeled by a symbol  that looks like a wrench. This LED provides a visual indication that the device needs service or is running diagnostics.

This LED turns ON solid for a short time during power-on reset as a lamp test, then changes to flashing until the power-on self-tests have completed.

The Maintenance indicator is also used to show the subsystem's response to an offline request from the operator/CE to execute the functional Read/Write diagnostic. This LED also flashes any time the device is busy running the functional Read/Write diagnostic with a scratch cartridge loaded. See "Verify Fix" on page PROC-9 for the Read/Write diagnostic selection procedure.

Another use of this LED is in conjunction with the Busy and Clean indicators to display additional maintenance information to the operator or CE. See "Drive Indicators-Normal Operation for Drive-Only Models" on page START-10 for the other uses of the Maintenance indicator.

Last, this indicator will flash, along with the Busy and Clean LEDs, when the device detects a problem that requires a service call for resolution. Also, if, during the power on sequence, this LED does not flash or does not turn OFF but remains ON solid, the device needs service.



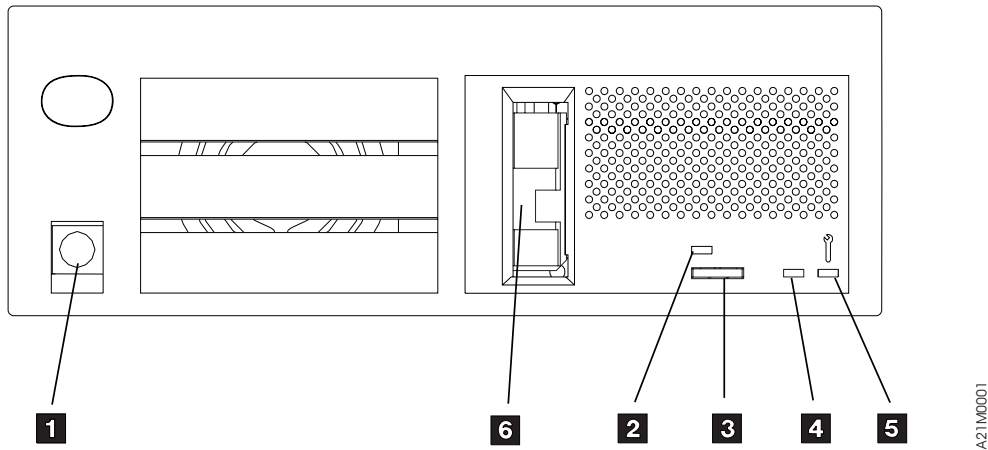


Figure 46. Model B00 Drive Operator Controls

**Note:** There is no indicator on the Model B00 to indicate when a cartridge is loaded and ready for reading and writing. As a cartridge is loaded in the drive, the BUSY indicator will momentarily light while the drive is locating to the loadpoint on the tape. The drive is ready for reading and writing when the indicator goes out after loading the tape.

---

## Library Operator Panel

Library models have an operator panel that has four push buttons and a LCD display located in the upper right-hand corner of the library when the subsystem is in a horizontal position. See item 1 in Figure 48 on page INTRO-44 and item 1 in Figure 47. The library operator panel display is the interface for all operator and CE functions that are available in the library models of the 3570 Tape Subsystem. See "Operator Panel" on page PANEL-1 for details of the operator panel operations, LED indicators, and messages displayed. A brief description of the operator panel control switches and LED indicators follows. The key lock and library door are also briefly described.

**Note:** Figure 47 shows the library operator panel display and its controls. The operator panel consists of a library operator panel display, operator panel LED indicators, a Power On/Off push button, and a key lock. These and additional components of the front cover assembly are discussed in more detail later in this chapter.

## Operator Panel Controls and Indicators

The operator panel on library models provides a menu-driven operator and service display interface. It is the primary means of communication to the operator and service representative on library machines. Refer to Figure 47.

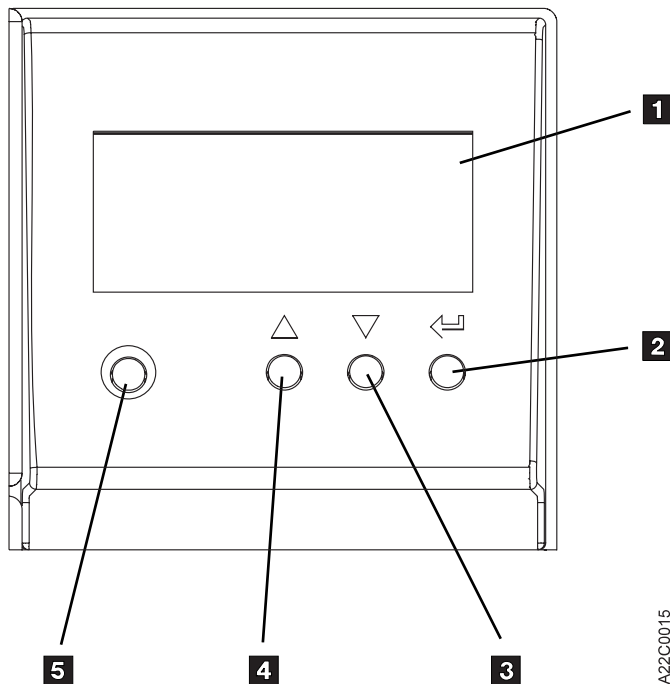


Figure 47. Operator Panel Display for Library Models

The operator panel has the following display and menu control switches:

- Library operator panel display, item 1
- Enter push button, item 2
- Scroll Down push button, item 3
- Scroll Up push button, item 4
- Mode push button, item 5

Each is further defined below. Refer to Figure 47 for the locations of the operator panel display and switches.

**Item 1 Library operator panel display:** The library operator panel display has the following attributes:

- Four lines by sixteen characters
- 58.2 mm (2.3 in.) wide by 25.2 mm ( 1 in.) high

The library operator panel display provides the primary feedback to the operator and service representative for most library activities.

**Item 2 Enter Push Button:** The Enter push button is marked by a backward arrow



icon symbolizing the **Enter** key as used on some keyboards. Pressing this push button causes the device to select the option or to perform the function indicated.

**Item 3 Scroll Down Push Button:** The Scroll Down push button is marked with a down arrow head icon. Pressing this push button causes the selection arrow > to move down to the next option on the menu if any additional options are *below* the currently-indicated option. If additional menu items are below the last item on the menu, a + is indicated in the lower right-hand corner of the display.

**Item 4 Scroll Up Push Button:** The Scroll Up push button is marked with an up arrow head icon. Pressing this push button causes the selection arrow > to move up to the next option on the menu if any additional options are *above* the currently-indicated option. When additional menu items are above the top item on the menu, a + is indicated in the upper right-hand corner of the display. If no additional options are above the highest displayed option, pressing the push button does not affect operations.

**Item 5 Mode Push Button:** The Mode push button is used for selecting either CE mode or operator mode. At power on, the device is always in operator mode. CE mode may be selected at any time, but the 3570 will not allow a mode change until the operation in progress is completed. Operator mode can be selected at any time. The Change Mode push button should only be used by qualified service representatives. This push button should not be used during normal operations.

**Note:** While the 3570 is in CE mode, the subsystem is offline to the host and unavailable for read and write operations.

## Front Panel Overview

Figure 48 shows the front assembly for Models B01, B02, B11 and B12.

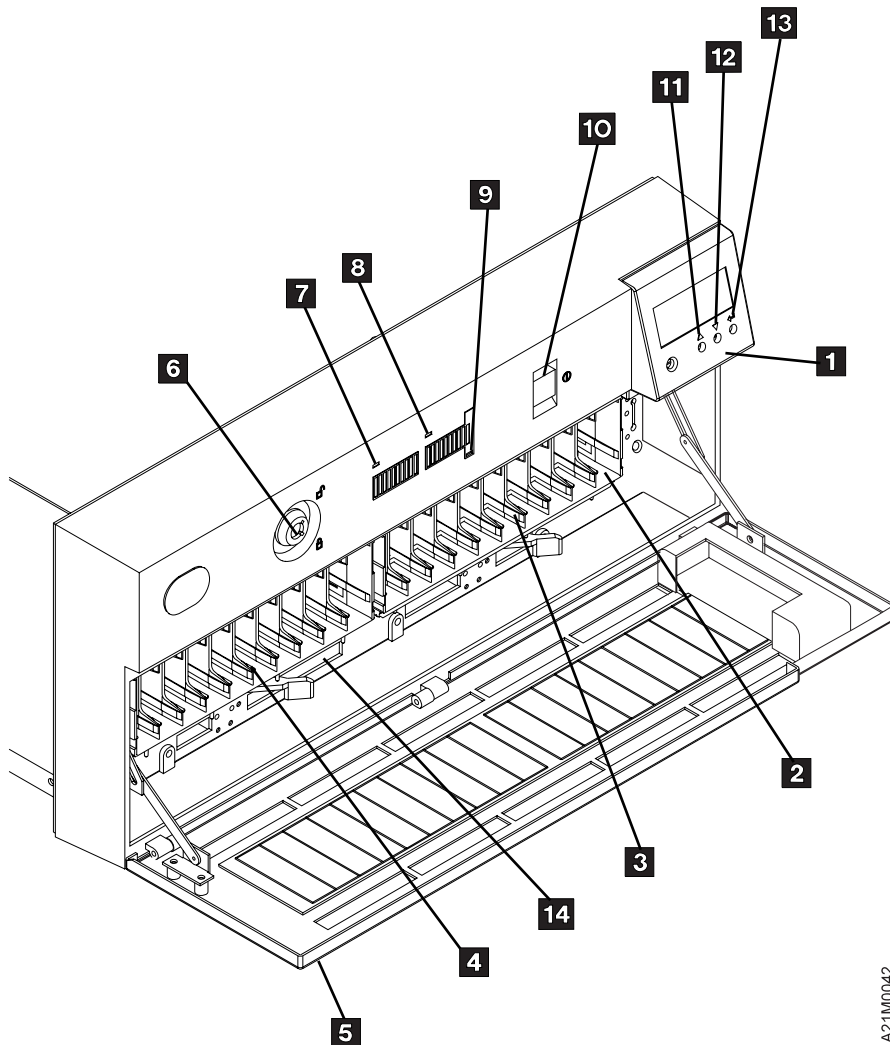


Figure 48. Front Assembly for Model B01, B11, B02, or B12

### 1 Operator Panel Display

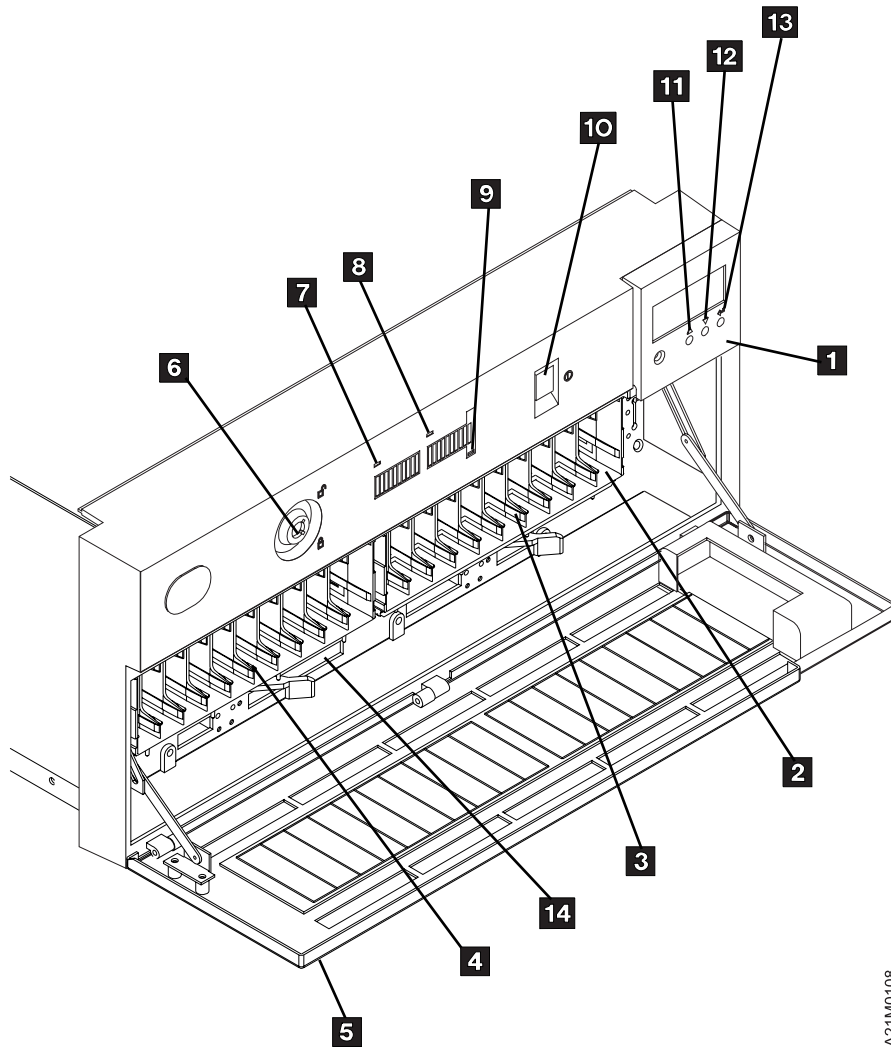
See "Operator Panel Overview" on page PANEL-3 for a description of the operator panel.

### 2 Priority Cell

Models B01, B11, B02, B12, B21 and B22 have a priority cell that can be used to load or unload cartridges from the subsystem without removing the cartridge magazine. Because cartridges can be inserted without opening the door, the integrity of the tape inventory is not violated. To use this feature, magazine 1 must be present and the rightmost cartridge cell must be unused.

Its functions are as follows:

When in automatic or manual mode, requests to mount an external cartridge can be satisfied by placing the specified cartridge into the priority cell in the import position and pressing START. The cartridge in the priority cell will be the next one loaded into the drive. When the drive has unloaded the cartridge, it will be returned to the priority cell in the export position.



A21M0108

Figure 49. Front Assembly for Model B21 and B22

When in random mode, the priority cell acts as an import/export station for the automated library. Because cartridges can be inserted into the priority cell without opening the door, additions or removals can be made to the cartridge inventory under control of the host (initiator) without opening the door and violating the integrity of the inventory.

**Note:** When using the priority cell, the cartridge must be placed in the import position.

- 3 **Magazine 1 Location**
- 4 **Magazine 2 Location**
- 5 **Door**

The door protects the integrity of the inventory in the library units. As long as the door remains closed, the host knows that the magazine inventory remains unchanged. If the door is opened, the host (initiator) is alerted that the inventory may have changed. The door also acts as a safety interlock. When the door is opened, the transport mechanism will complete any movement in progress and stop. The transport mechanism will not move until the door is closed. The library will restart when the door is closed without any further intervention by the operator.

**Note:** Be careful, when opening the library door, to **not** move cartridges from the export position back to the import position.

## 6 Security Key Lock

The security key lock locks the door closed. The Security Key lock on the library helps maintain security for cartridges in the library unit. It is a physical lock only, and is not sensed or controlled by the initiator or device. When locked, the only way to add or remove cartridges to or from the library units is through the priority cell.

## 7 Magazine 2 In Use Indicator

The yellow LED indicates the status of Magazine 2. When it is on, the operator should not add or remove cartridges to or from that magazine and should not remove that magazine from the library unit. The Magazine In Use LED is on when a cartridge from the magazine has been transported to the drive for processing, or when the library unit is in random mode and the initiator has issued the Prevent/Allow Medium Removal command with the prevent bit set.

The LED also turns ON solid momentarily during power-on reset as a lamp test, and it flashes during bring-up diagnostics.

## 8 Magazine 1 In Use Indicator

This yellow LED indicates the status of Magazine 1 and operates the same as indicator 7 .

## 9 Priority Cell In Use Indicator

This yellow LED indicates the status of the priority cell. When the LED is on, a cartridge is in the priority cell or the priority cell is reserved for the cartridge currently being processed in the drive. When the LED is on, the operator should not place a cartridge in the priority cell or remove a cartridge from the priority cell. When the LED is not on, the operator can place a cartridge in the priority cell for processing or can remove a cartridge from the priority cell. The indicator is visible with the door open or closed.

This LED turns ON solid momentarily during the power-on reset as a lamp test, and flashes during the power-on diagnostics. After completion of the power-on sequence, this LED is turned OFF until it is turned ON by activity that involves the priority cell.

## 1 Power On/Off Switch

This switch is connected to the dc power supply by a cable. The switch removes dc power from the output of the power supply. There is no LED to indicate a power-on condition of the library units. The power is on when the operator panel is active.

**Note:** With the switch in the Off position, ac voltage is still available inside the subsystem power supply.

## 11 Scroll Up Button

## 12 Scroll Down Button

## 13 Enter Button

## 14 Serial number (above lever opening)

# Subsystem Initialization

Subsystem initialization includes power sequencing, initial microprogram load (IML), and subsystem diagnostics.

**Initial Microprogram Load:** During an initial microprogram load (IML), a microcode image that permits the subsystem to become functional is loaded into the subsystem RAM.

When the subsystem is powered on, the unit attempts to perform an IML from flash EPROMS.

**Power Sequencing:** When power is applied, internal logic of the integrated control unit checks the voltages. When all the voltages have tested correctly, the power-on self-test (POST) is executed at power-on time by the RAS microcode. If the voltage is out-of-spec, the subsystem logic is held in the reset state. Errors detected during the power-on sequence are displayed in the LED indicators on the drive and on the Library operator panel if installed.

## Subsystem Diagnostics

Subsystem Diagnostics are divided into two categories:

- Power-on self-test (POST)

- Functional Tests

**POST Diagnostics:** POST diagnostics are initiated at power-on time. They are a combination of built-in self-tests of logic modules, memory tests, control logic, sensor tests and data path tests. A portion of the POST diagnostics is also executed when a fix-verification test is invoked from the host processor via a SCSI command.

Errors detected during execution of POST are displayed as a FRU identifier code (FID) in the drive LED indicators and on the operator message panel of Library models. The error information is also sent in a service information message (SIM) over the SCSI interface if the customer application supports the SIM feature. The FID can be cross referenced to the entry table in Figure 8 on page START-12.

**Functional Tests:** The functional-test diagnostics verify that the machine performs without errors. They can be invoked at any time either to verify a fix or to exercise the subsystem. These diagnostics may be invoked from the host via a SCSI command or from the drive operator controls or the operator panel on the library. See "Verify Fix" on page PROC-9 for detailed descriptions of test selections.

**Special RAS Characteristics:** The special RAS characteristics include:

- Real-time diagnostics

- Real-time failure isolation

- Hardware/media isolation

- Online microcode update

Also, the subsystem design permits:

- Complete self-testing whenever the subsystem is powered on.

- Operator notification whenever a failure is detected.

**Special Tools:** Special tools are either shipped, purchased, or ordered to repair the subsystem. See "Cleaning Cartridge" and Figure 50 on page INTRO-49 for examples of special tools.

**Cleaning Cartridge:** A special cleaning cartridge is part of the 3570 subsystem. This tool (P/N 05H2463) is used to clean the tape head. It is shipped with the subsystem. The cleaning cartridge is identified by a gray file protect selector. The need for cleaning is determined by the microcode in the 3570 Tape Subsystem.

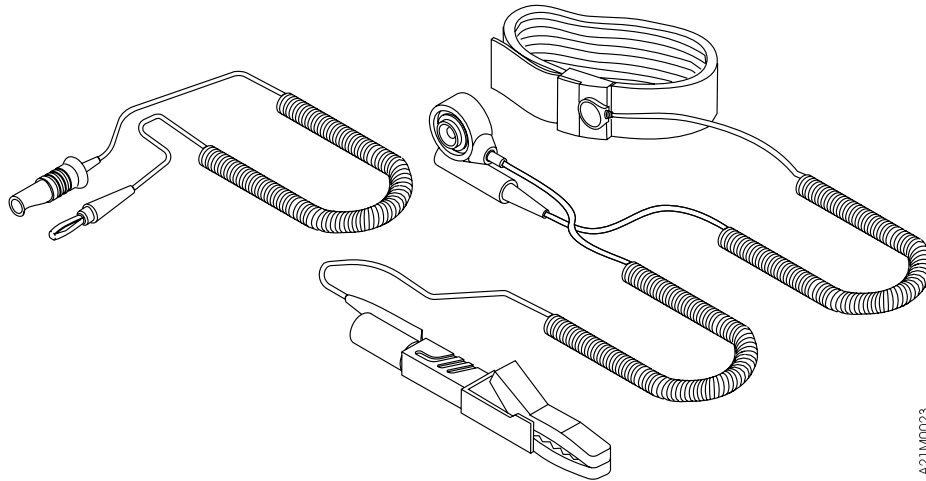
**Model B00 Drive:** If the operator does not have ready visibility of host console messages when cleaning is required, the Clean LED indicator (see Figure 46 on page INTRO-41) will also flash to indicate that cleaning is required. The operator will load the cleaning cartridge on the drive and the cleaning procedure occurs automatically. The cartridge unloads when the cleaning procedure is done.

**Library Models:** In the library configuration of the 3570 Tape Subsystem, the cleaning cartridge has a special storage location inside of the subsystem enclosure. This allows the cleaning cartridge to be automatically loaded when cleaning is required. At the completion of the cleaning operation, the cleaning cartridge is automatically returned to its storage cell. Cleaning can also be invoked for immediate action by an operator request through the operator panel.



## ESD Kit

The ESD kit (P/N is available in *General CE Tools Reference Summary*, 5131-0075) is used to prevent damage when you work with electrostatic discharge (ESD) sensitive parts. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4 for information on using the ESD grounding wrist strap and mat. **This tool ( Figure 50) is not shipped with the subsystem and must be ordered.**



A21M0023

Figure 50. ESD Grounding Strap



# Library

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## Library Description

The library models have, in addition to the drive units, a random access cartridge loader (library) which can load and unload tape cartridges from up to 20 magazine positions into the device drives, under control of the host system. Models with 1 drive may only operate in Base Configuration. Models with 2 drives may operate in Base Configuration or Split Configuration, as selected in the operator menus. The library can run in Automatic, Random, or Manual Mode and provides enhanced operator and CE communications with a library operator panel display that can present plain language messages to the operator and CE. This library operator panel display also provides a means to input operator or CE commands into the library device.

---

## Library Attachment for Models B01, B02, B11, B12, B21 and B22

Devices with a 20-cartridge library attachment create an automation subsystem library capable of either random access of volumes for tape processing applications or sequential access of volumes for backup, restore, and scratch volume operations. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345* for location and functional description of the library.

The operating mode of the library can be selected manually at the operator panel.

See Figure 51. The 20 cartridges for the library models are packaged 10 per magazine. Magazine 2 4 can contain 10 cartridges. Two of these magazines can be loaded into the subsystem at a time. The magazine is designed to provide retention of cartridges in each of the 10 storage cells in two possible physical positions, the *Import* position or the *Export* position. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345* for a detailed description of magazine functions.

Library models have a priority cell that can be used to load or unload cartridges from the subsystem without removing the cartridge magazine. To use this feature, the last cartridge cell in magazine 1 2 must be unused, that is, magazine 1 3 can contain only 9 cartridges (the right-most cell of magazine 1 must be empty). Magazine 1 must always be present to use the priority cell.

The operator panel 1 has a display and push buttons for operating the subsystem.

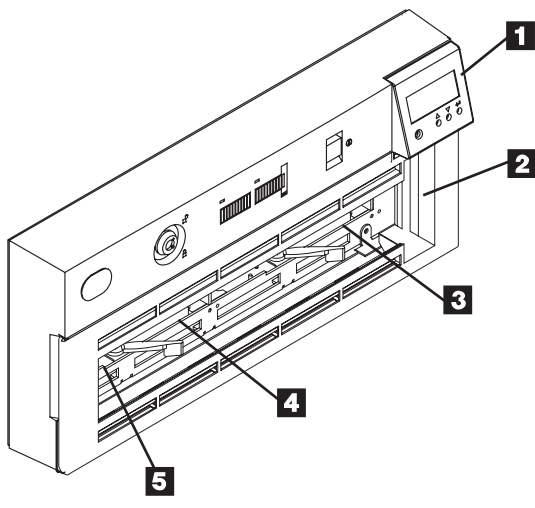


Figure 51. Magazine and Cartridge Locations for Library Models B01, B02, B11 and B12

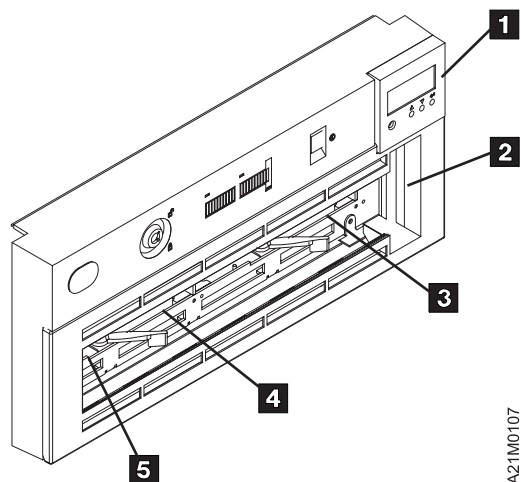


Figure 52. Magazine and Cartridge Locations for Library Models B21 and B22

## Library Magazine

See Figure 53 on page LIBRARY-4. The library can hold two 10-cartridge magazines 1. The magazine has two positions for each cartridge.

The cartridges are retained in either the import 2 or the export 3 position. The figure shows five cartridges in each position. This different positioning allows the operator to quickly see which and how many cartridges have been processed by the host system.

Replacement and additional magazines are purchased by the customer.

**Import Position:** The operator puts the cartridge to the fully inserted position, which is flush with the edge of the magazine. In this position, the Library transport has easy access to the cartridge, while the operator would have difficulty removing the cartridge.

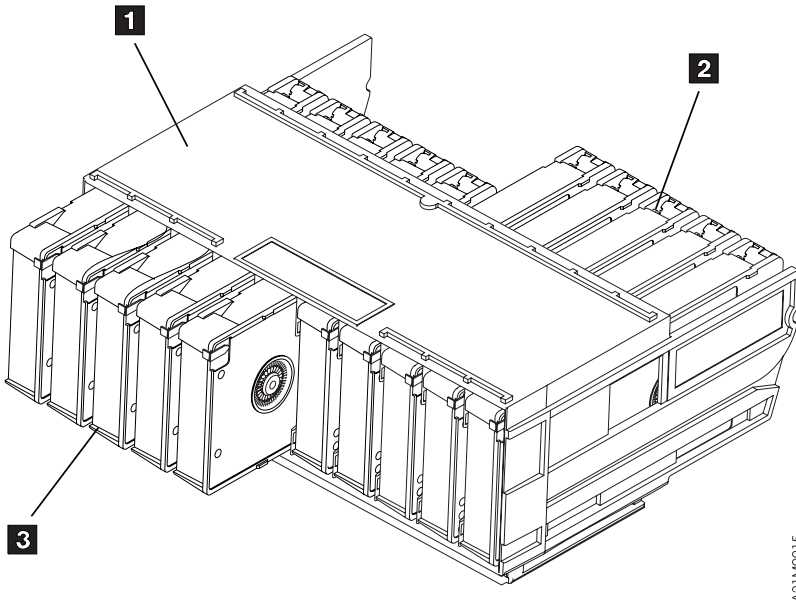
**Export Position:** The library puts the cartridge in this position so that the cartridge is partially exposed to where the operator can remove these *processed* cartridges.

**Note:** In random mode, the library returns the cartridge to the import position for future re-use, unless the initiator has asked for the cartridge to be exported from the magazine, in which case the cartridge is placed in the export position in the priority cell.

Each magazine has a cartridge lock that is automatically unlocked when the magazine is secured in the library, thus making the cartridges easily accessible to both the operator and the transport. See item 1 in Figure 54 on page LIBRARY-4

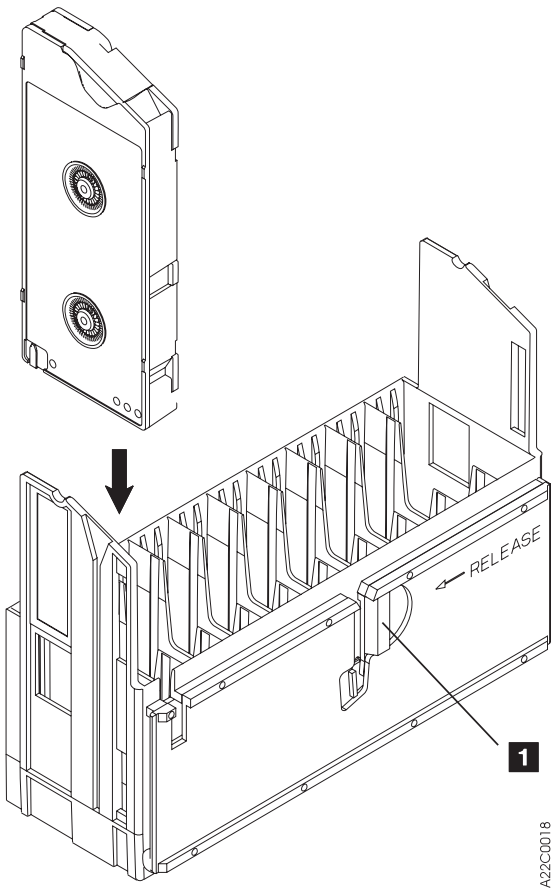
A thumb-operated slide mechanism allows the operator to temporarily unlock the magazine for cartridge removal and refilling. When the slide is released, the magazine automatically locks.

For random mode operation, magazine 1 (see Figure 51 on page LIBRARY-2) must be present to allow access to the priority cell. Requests for specific cartridges to be mounted can only be satisfied when magazine 1 is present in the library.



A21M0015

Figure 53. 3570 Cartridge Magazine



A22C0018

Figure 54. 3570 Cartridge Magazine Lock Lever

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## Library Operation

This section describes the library modes of operation, operating procedures, and operator menus for Models B01, B11, B02, B12, B21 and B22.

---

### Library Modes of Operation

This section describes the library modes of operation, operating procedures, and operator menus for Models B01, B11, B02, B12, B21 and B22.

The library processes cartridges either sequentially or non-sequentially under direction of the host. For sequential processing, the library is capable of operating in either automatic or manual modes, selectable at the operator panel. These two modes are identical except that following each unload operation in manual mode, the operator must push a button to initiate the next load operation.

In order to process cartridges in a non-sequential manner, the library must be set to random mode at the operator panel.

The mode selected by the operator is stored in non-volatile memory and becomes the default mode during subsequent power-on cycles.

**ADSM Note:** it is recommended the Magstar MP be configured to operate in Random Mode in Base Configuration. This allows ADSM to use the second drive for reclamation.

### Random Mode

Random mode allows the Magstar MP to act as a self-contained library of up to 19 cartridges, controlled entirely by SCSI hosts. In addition, access is provided to a 20th cartridge through the priority cell. The host uses SCSI commands to a Medium Changer device to select a cartridge from a source element and move it to its destination element. Control of the source and destination elements is left entirely to the host.

A request for an external cartridge to be mounted can be satisfied by inserting the cartridge into the priority cell in the import position. The Magstar MP notifies hosts of the presence of a cartridge in the priority cell, but the host must specifically address that cell to access the cartridge.

When the destination of a move is a magazine cell, the transport mechanism places the cartridge in the cell in the import position for possible later re-use. However, if the destination is the priority cell, the transport mechanism places the cartridge in the cell in the export position.

Because the library door must be closed while in random mode, the priority cell is used as an import/export station to add or remove cartridges from the library without violating the integrity of the magazine inventory. A host can cause cartridges from the priority cell to be moved to any empty magazine cell or to a device. It can also cause cartridges from a magazine or a device to be moved to the priority cell. Requests for external cartridges to be mounted can only be satisfied when magazine 1 (the rightmost magazine) is present. Library inventory and control is entirely the responsibility of the hosts. If the library door is opened while in random mode, the drive responds to the next command with a Unit Attention condition.

## Automatic (Sequential) Mode

Automatic mode provides the customer the ability to operate the library as a sequential autoloader, keeping the tape drive continually fed with cartridges. The host (initiator) controls only the unload of a cartridge from the tape drive. The library will automatically load the next available cartridge into the drive after the ejected cartridge is put back into the magazine. All media changer operations are effectively hidden from the system.

When automatic mode is selected, the cartridges are automatically processed according to their positions in the magazines. The library processes all cartridges that are in import positions sequentially, beginning at the rightmost cell position and then proceeding from right to left as viewed from the front of the library.

After processing a cartridge, the library returns it to its original magazine cell and places it in the export position.

The operator can supply external cartridges to an application by inserting a cartridge in the priority cell in the import position. Any cartridge inserted in the priority cell will automatically be the next cartridge loaded into the drive. When that specific cartridge is unloaded, the library returns the cartridge to the priority cell in the export position and resumes processing cartridges from the magazine. The library continues to search for cartridges until it has searched all cells without finding a cartridge in the import position.

The operator can remove cartridges that are in the export position from magazines and add cartridges in the import position to the magazine while the library is in automatic mode. The library stops when the door is opened. When the door is closed, the library resumes operation where it left off. If a cartridge is in a drive when the door is opened, processing continues until complete. When the door is closed, the cartridge is returned to the cell from which it was removed.

An operator may also insert full magazines into the library when it is in automatic mode.

If the operator unloads a cartridge from the tape drive by using the operator panel on the Magstar MP Tape Subsystem, the operator must select START on the operator panel to load the next cartridge. If the cartridge is unloaded from the tape drive by the host, the next cartridge is automatically loaded in the tape drive. There is no need for the operator to select START on the operator panel.

## Manual (Sequential) Mode

In manual mode, the library functions the same as in the automatic mode, except the operator initiates each load operation. Each time the operator selects START from the **Options Menu**, the library selects the cartridge from the next unprocessed magazine cell and mounts it in the drive. Manual mode operation is also activated by placing a cartridge in the import position of the priority cell and selecting START. Only one cartridge is processed for each operator action. After being unloaded, each cartridge is returned to the magazine location from which it was taken and placed in the export position.

The library starts processing cartridges beginning at the rightmost cell in the library. The search for unprocessed cartridges is from right to left across the magazine(s) as viewed from the front of the library.



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## Library Configurations

Models B02, B12 and B22 may operate in Base Configuration or Split Configuration as selected in the operator menus. Models B01, B11 and B21 do not support Split Configuration.

### AS/400 Notes:

1. If attached to an AS/400 system, when switching between Base and Split configuration, the I/O processor must be reloaded. To reload the I/O processor, vary off and on with reset, or use STRSST to IPL the I/O processor.
2. If the Magstar MP Model B02, B12 or B22 is in Split Configuration, microcode update is not supported using the PTF process. The service representative must update the Magstar MP using an FMR tape according to the instructions in the maintenance information manual.

## Base Configuration

In a Base Configuration, all magazine cells are accessible to all hosts (initiators) on the bus. The library mode of operation is selected at the operator panel for drive 1 only, but it applies to the entire library. For dual drive libraries on a single host the drives must have unique addresses. Multiple host attachments may have unipue or identical addresses.

**Random Mode - Base Configuration:** See “Random Mode” on page LIBRARY-5 for an overview of this mode. Magstar MP acts as a self-contained library of up to 19 cartridges with additional access to a 20th cartridge through the priority cell. In models with 2 drives, the source and destination elements of a move can indicate either drive. (Both drives can be used.) See “SCSI Medium Changer Addressing for Base and Split Configurations” on page LIBRARY-8.

**Automatic Mode - Base Configuration:** See “Automatic (Sequential) Mode” on page LIBRARY-6 for an overview of this mode. In models with 2 drives, only drive 1 is used for this mode. Drive 2 is unused. The library processes all cartridges that are in import positions sequentially, beginning at the rightmost priority cell position, then proceeding from right to left across both magazines as viewed from the library front.

**Manual Mode - Base Configuration:** See “Manual (Sequential) Mode” on page LIBRARY-6 for an overview of this mode. In models with 2 drives, only drive 1 is used for this mode. Drive 2 is unused. The library processes all cartridges that are in import positions sequentially, beginning at the rightmost priority cell position, then proceeding from right to left across both magazines as viewed from the library front.

## Split Configuration

It is advantageous to be able to share a single library between host systems. Unfortunately, some applications (and some systems) do not allow for sharing devices between systems. Split Configuration allows for a single library to be used by multiple systems by having the library manage this ‘sharing’. This is accomplished by having the library appear as two separate half-size libraries on each of two SCSI busses. Two SCSI busses are created when the SCSI Bus Jumper is removed between the drive 1 and drive 2 SCSI ports.

Split Configuration is created by logically dividing one physical library into two virtual libraries.

Virtual Library 1 consists of:

Drive 1,

Magazine 1 (including the priority cell), and

The transport mechanism.

Virtual Library 2 consists of:

Drive 2,

Magazine 2, and

The transport mechanism.

Virtual Library 1 is available to host systems via the drive 1 SCSI port, and Virtual Library 2 is available to host systems via the drive 2 SCSI port. Cartridges not in the virtual library associated with a port are not accessible to commands received on that port.

In a Split Configuration, the library mode of operation is selected separately for drive 1 (Virtual Library 1) and drive 2 (Virtual Library 2). All possible combinations of modes of operation are allowed in Split Configuration. For dual drive libraries in split configuration, single host drives must have unique SCSI addresses. Multiple host attachment may have unique or identical addresses.

**Random Mode - Split Configuration:** See “Random Mode” on page LIBRARY-5 for an overview of this mode. All operations for the priority cell are associated with Virtual Library 1 only. For Virtual Library 1, Magstar MP acts as a self-contained library of up to 9 cartridges with additional access to a 10th cartridge through the priority cell. For Virtual Library 2, the Magstar MP acts as a self-contained library of up to 10 cartridges, with no host access to the priority cell. See “SCSI Medium Changer Addressing for Base and Split Configurations.”

**Automatic Mode - Split Configuration:** See “Automatic (Sequential) Mode” on page LIBRARY-6 for an overview of this mode. All operations for the priority cell are associated with Virtual Library 1 only. For Virtual Library 1, the operation begins at the right-most priority cell position, then proceeds from right to left across magazine 1. For Virtual Library 2, the operation begins at the right-most cell in magazine 2, then proceeds from right to left across magazine 2.

**Manual Mode - Split Configuration:** See “Manual (Sequential) Mode” on page LIBRARY-6 for an overview of this mode. All operations for the priority cell are associated with Virtual Library 1 only. For Virtual Library 1, the operation begins at the right-most priority cell position, then proceeds from right to left across magazine 1. For Virtual Library 2, the operation begins at the right-most cell in magazine 2, then proceeds from right to left across magazine 2.

---

## SCSI Medium Changer Addressing for Base and Split Configurations

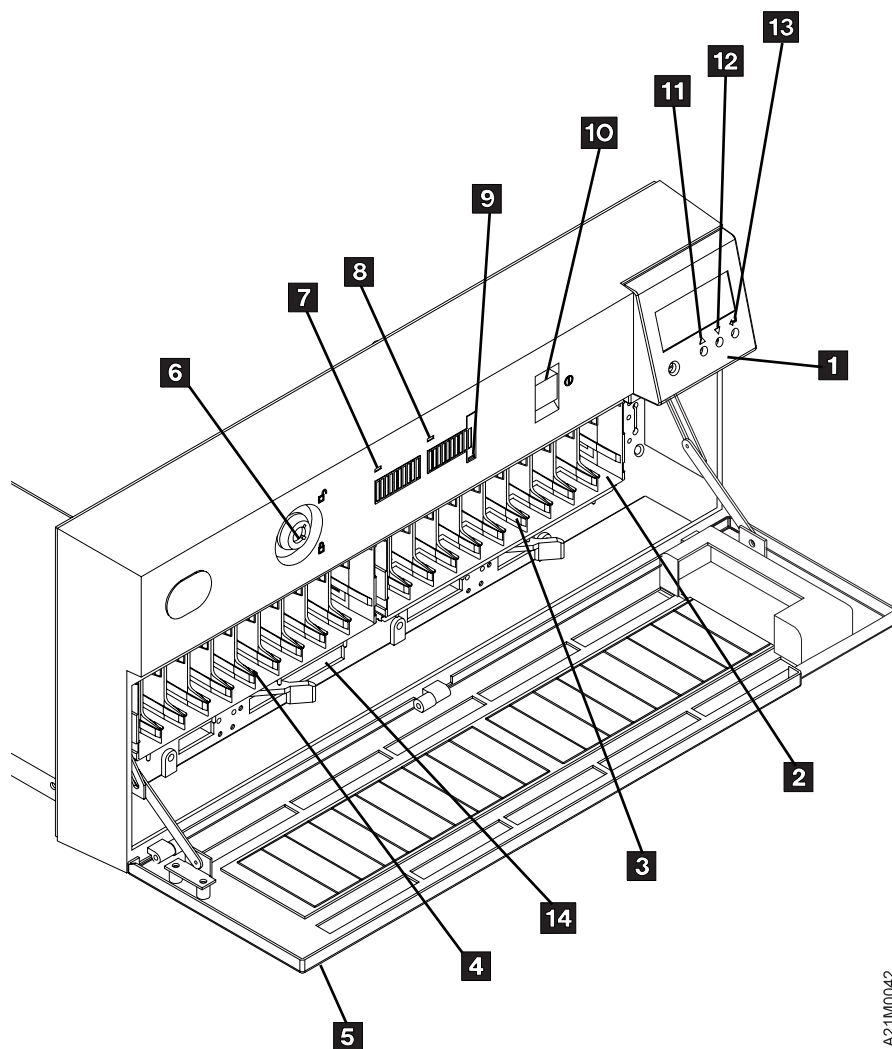
Magstar MP library models are consistent with the SCSI standard for Sequential Access and Medium Changer devices. Each tape drive in a Magstar MP library has a unique SCSI device ID. The library control interface consists of a SCSI Medium Changer device available as a logical unit through one or both drive ports, depending on the library configuration.

For a Base Configuration, a Medium Changer device is available through the drive 1 SCSI port only. This is the default configuration for all library models.

For Split Configuration, the transport mechanism is shared, but it appears as two Medium Changer devices, one for each drive SCSI port.

## Front Panel Overview

Figure 55 and Figure 56 on page LIBRARY-10 shows the front assembly for Model B drives.



A21M0042

Figure 55. Front Assembly for Model B01, B11, B02, or B12

### 1 Operator Panel Display

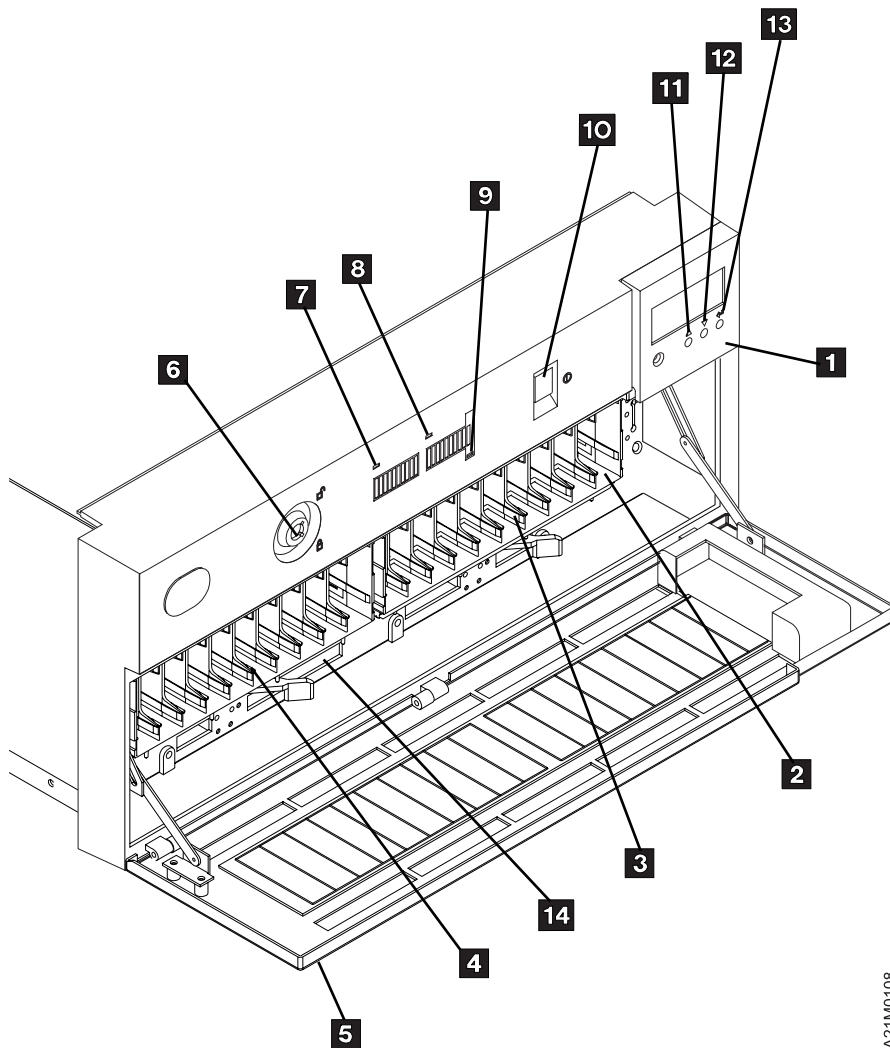
See “Library Operator Panel” on page INTRO-42 for a description of the operator panel.

### 2 Priority Cell

Models B01, B11, B02, B12, B21 and B22 have a priority cell that can be used to load or unload cartridges from the subsystem without removing the cartridge magazine. Because cartridges can be inserted without opening the door, the integrity of the tape inventory is not violated. To use this feature, magazine 1 must be present and the rightmost cartridge cell must be unused.

Its functions are as follows:

When in automatic or manual mode, requests to mount an external cartridge can be satisfied by placing the specified cartridge into the priority cell in the import position and pressing START. The cartridge in the priority cell will be the next one loaded into the drive. When the drive has unloaded the cartridge, it will be returned to the priority cell in the export position.



A21M0108

| Figure 56. Front Assembly for Model B21 and B22

When in random mode, the priority cell acts as an import/export station for the automated library. Because cartridges can be inserted into the priority cell without opening the door, additions or removals can be made to the cartridge inventory under control of the initiator without opening the door and violating the integrity of the inventory.

**Note:** When using the priority cell, the cartridge must be placed in the import position.

- 3 **Magazine 1 Location**
- 4 **Magazine 2 Location**

---

## Library Operator Panel

Library models have an operator panel that has four push buttons and a display located in the upper right-hand corner of the library when the subsystem is in a horizontal position. See Figure 57 on page LIBRARY-11. The library operator panel display is the interface for all operator and CE functions that are available in the library models of the 3570 Tape Subsystem. See "Operator Panel" on page PANEL-1 for a details of the operator panel operations, LED indicators, and messages displayed. A brief description of the operator panel control switches and LED indicators follows. The key lock, library door, and other front cover components are described briefly.

## Operator Panel Display and Controls

Figure 57 on page LIBRARY-11 shows the operator panel display and operator panel controls:

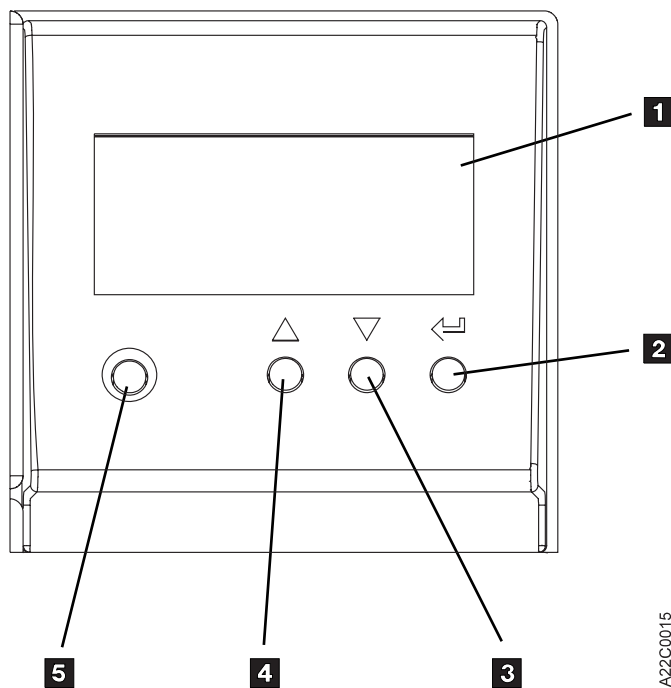


Figure 57. Operator Panel Display for Library Models

**Item 1 Library operator panel display:** The library operator panel display consists of the following:

Four lines by sixteen characters  
58.2 mm (2.3 in.) wide by 25.2 mm ( 1 in.) high

**Note:** Two styles of library operator panel exist. The Models B01, B02, B11 and B12 have a display with a sloping face to reduce glare. The Model B21 and B22 display has a flat face. Except for the shape and part number, they are identical.

## Operator Panel Control Push Buttons

The library operator panel display has the following menu control switches:

Enter push button, item 2  
Scroll Down push button, item 3  
Scroll Up push button, item 4  
Mode push button, item 5

**Item 2 Enter Push Button:** The Enter push button is marked by a backward arrow



icon symbolizing the **Enter** key as used on some keyboards. Pressing this push button causes the device to select the option or to perform the function indicated. If a FID was being displayed when enter was pressed, the FID is deleted from the display panel and entered into the Error log.

**Item 3 Scroll Down Push Button:** The Scroll Down push button is marked with a down arrow head icon. Pressing this push button causes the selection arrow > to move down to the next option on the menu, if any additional options are *below* the currently-indicated option. If additional menu items are below the last item on the menu, a + is indicated in the lower right-hand corner of the display. If no additional options are below the currently selected option, pressing the push button does not affect operations.

**Item 4 Scroll Up Push Button:** The Scroll Up push button is marked with an up arrow head icon. Pressing this push button causes the selection arrow > to move up to the next option on the menu if any additional options are *above* the currently-indicated option. If no additional options are above the currently selected option, pressing the push button does not affect operations.

**Item 5 Mode Push Button:** The Mode push button is used for selecting either CE mode or operator mode. At power on, the device is always in operator mode. CE mode may be selected at any time, but the 3570 will not allow a mode change until the operation in progress is completed. Operator mode can be selected at any time. The Mode push button should only be used by qualified service representatives. This push button should not be used during normal operations.

**Note:** While the 3570 is in CE mode, the subsystem is offline to the host and unavailable for read and write operations.

---

## Front Panel Indicators and Controls

Figure 55 shows the front assembly for Models B01, B02, B11 and B12. Figure 56 shows the front assembly for Models B21 and B22.

### 1 Operator Panel Display

See "Operator Panel Overview" on page PANEL-3 for a description of the operator panel.

### 2 Priority Cell

Models B01, B11, B02, B12, B21 and B22 have a priority cell that can be used to load or unload cartridges from the subsystem without removing the cartridge magazine. Because cartridges can be inserted without opening the door, the integrity of the tape inventory is not violated. To use this feature, magazine 1 must be present and the rightmost cartridge cell must be unused.

Its functions are as follows:

When in automatic or manual mode, requests to mount an external cartridge can be satisfied by placing the specified cartridge into the priority cell in the import position and pressing START. The cartridge in the priority cell will be the next one loaded into the drive. When the drive has unloaded the cartridge, it will be returned to the priority cell in the export position.

When in random mode, the priority cell acts as an import/export station for the automated library. Because cartridges can be inserted into the priority cell without opening the door, additions or removals can be made to the cartridge inventory under control of the host (initiator) without opening the door and violating the integrity of the inventory.

**Note:** When using the priority cell, the cartridge must be placed in the import position.

### 3 Magazine 1 Location

### 4 Magazine 2 Location

### 5 Door

The door protects the integrity of the inventory in the library units. As long as the door remains closed, the host knows that the magazine inventory remains unchanged. If the door is opened, the host

(initiator) is alerted that the inventory may have changed. The door also acts as a safety interlock. When the door is opened, the transport mechanism will complete any movement in progress and stop. The transport mechanism will not move until the door is closed. The library will restart when the door is closed without any further intervention by the operator.

**Note:** Be careful, when opening the library door, to **not** move cartridges from the export position back to the import position.

#### 6 Security Key Lock

The security key lock locks the door closed. The Security Key lock on the library helps maintain security for cartridges in the library unit. It is a physical lock only, and is not sensed or controlled by the initiator or device. When locked, the only way to add or remove cartridges to or from the library units is through the priority cell.

#### 7 Magazine 2 In Use Indicator

The yellow LED indicates the status of Magazine 2. When it is on, the operator should not add or remove cartridges to or from that magazine and should not remove that magazine from the library unit. The Magazine In Use LED is on when a cartridge from the magazine has been transported to the drive for processing, or when the library unit is in random mode and the initiator has issued the Prevent/Allow Medium Removal command with the prevent bit set.

The LED also turns on solid momentarily during power-on reset as a lamp test, and it flashes during bring-up diagnostics.

#### 8 Magazine 1 In Use Indicator

This yellow LED indicates the status of Magazine 1 and operates the same as indicator 7 .

## 9 Priority Cell In Use Indicator

This yellow LED indicates the status of the priority cell. When the LED is on, a cartridge is in the priority cell or the priority cell is reserved for the cartridge currently being processed in the drive. When the LED is on, the operator should not place a cartridge in the priority cell or remove a cartridge from the priority cell. When the LED is not on, the operator can place a cartridge in the priority cell for processing or can remove a cartridge from the priority cell. The indicator is visible with the door open or closed.

This LED turns on solid momentarily during the power-on reset as a lamp test, and flashes during the power-on diagnostics. After completion of the power-on sequence, this LED is turned off until it is turned on by activity that involves the priority cell.

### 1 Power On/Off Switch

This switch is connected to the dc power supply by a cable. The switch removes dc power from the output of the power supply. There is no LED to indicate a power-on condition of the library units. The power is on when the operator panel is active.

**Note:** With the switch in the Off position, ac voltage is still available inside the subsystem power supply.

### 11 Scroll Up Button

### 12 Scroll Down Button

### 13 Enter Button

### 14 Serial number (above lever opening)



## Library Components

The library components are shown in Figure 58, Figure 59 on page LIBRARY-16, Figure 60 on page LIBRARY-17, Figure 61 on page LIBRARY-18, Figure 62 on page LIBRARY-19 and Figure 63 on page LIBRARY-20. They offer 20 cartridge automated cartridge loader capable of operating in random access mode or sequential access mode for tape volumes. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345* for location and functional description of the library. Each major component is discussed below. Because the six library configurations are nearly identical except for number of drives installed, and design of external covers, references will generally be made to Figure 61 on page LIBRARY-18 to simplify the presentation. Be aware that the Models B02, B12 and B22 have two drives installed while the Models B01, B11 and B21 have only one drive.

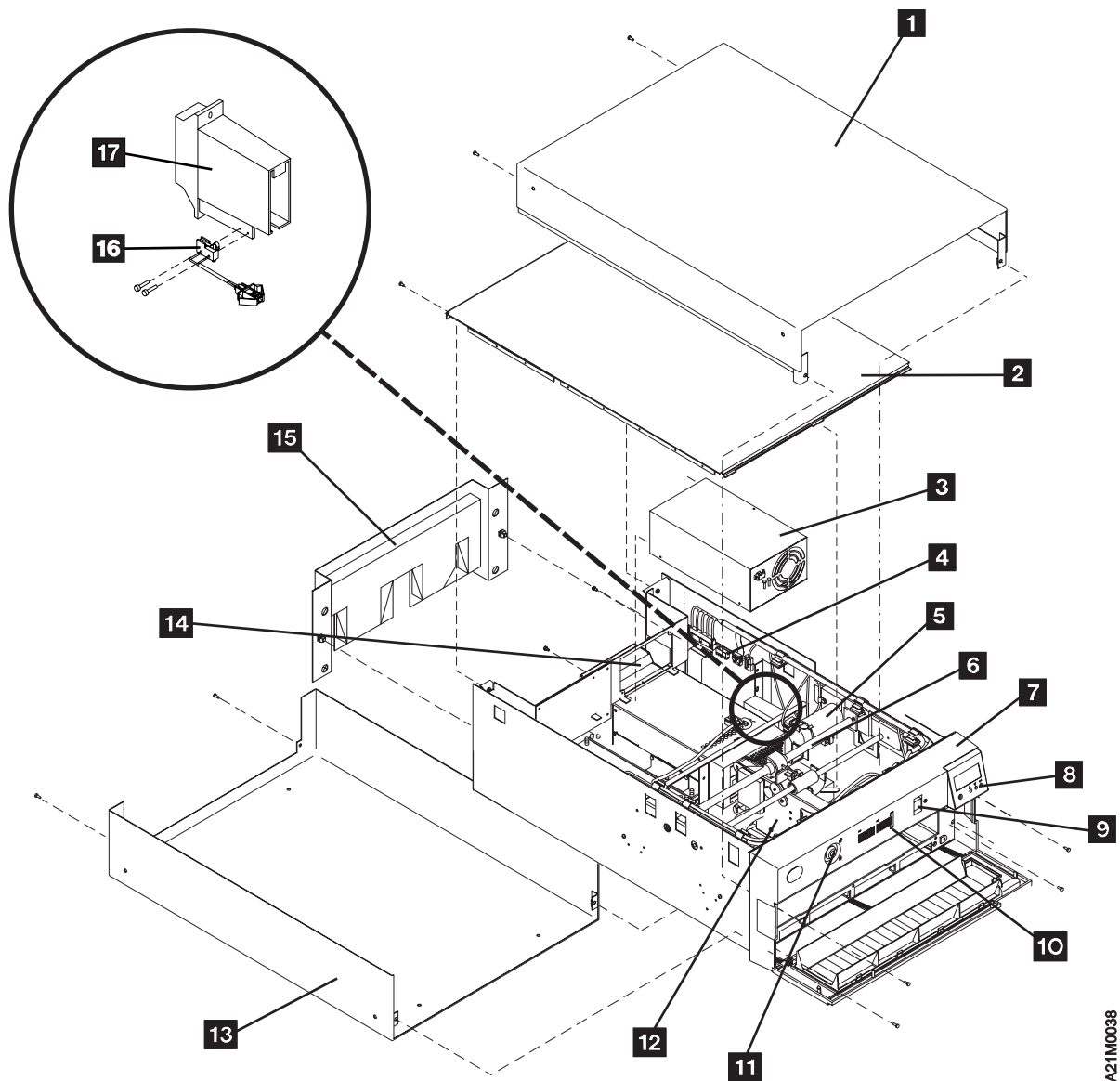
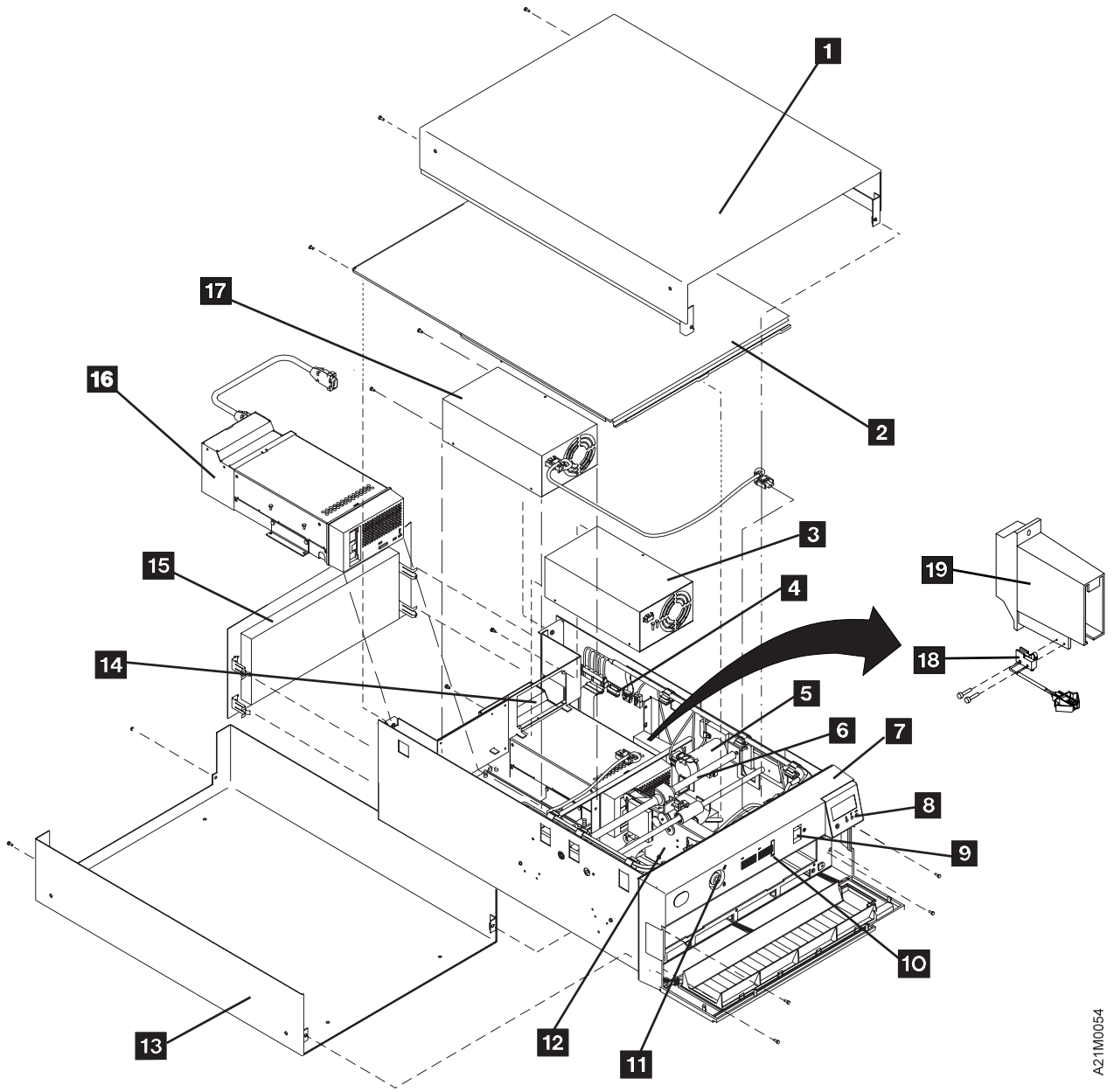


Figure 58. Model B01-Stand-Alone Library Model

A21M0038



A21M0054

Figure 59. Model B02-Stand-Alone Library Model

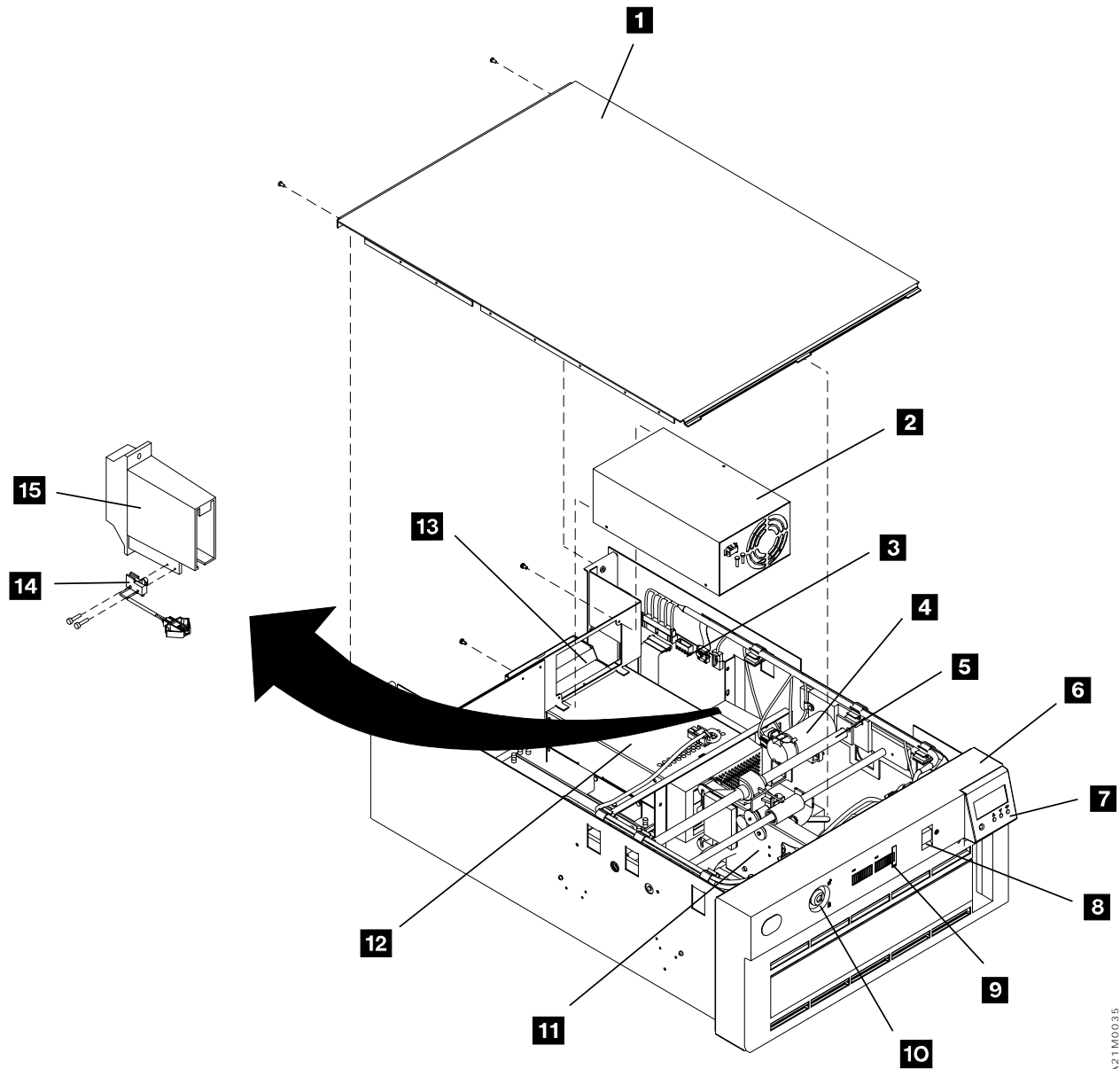
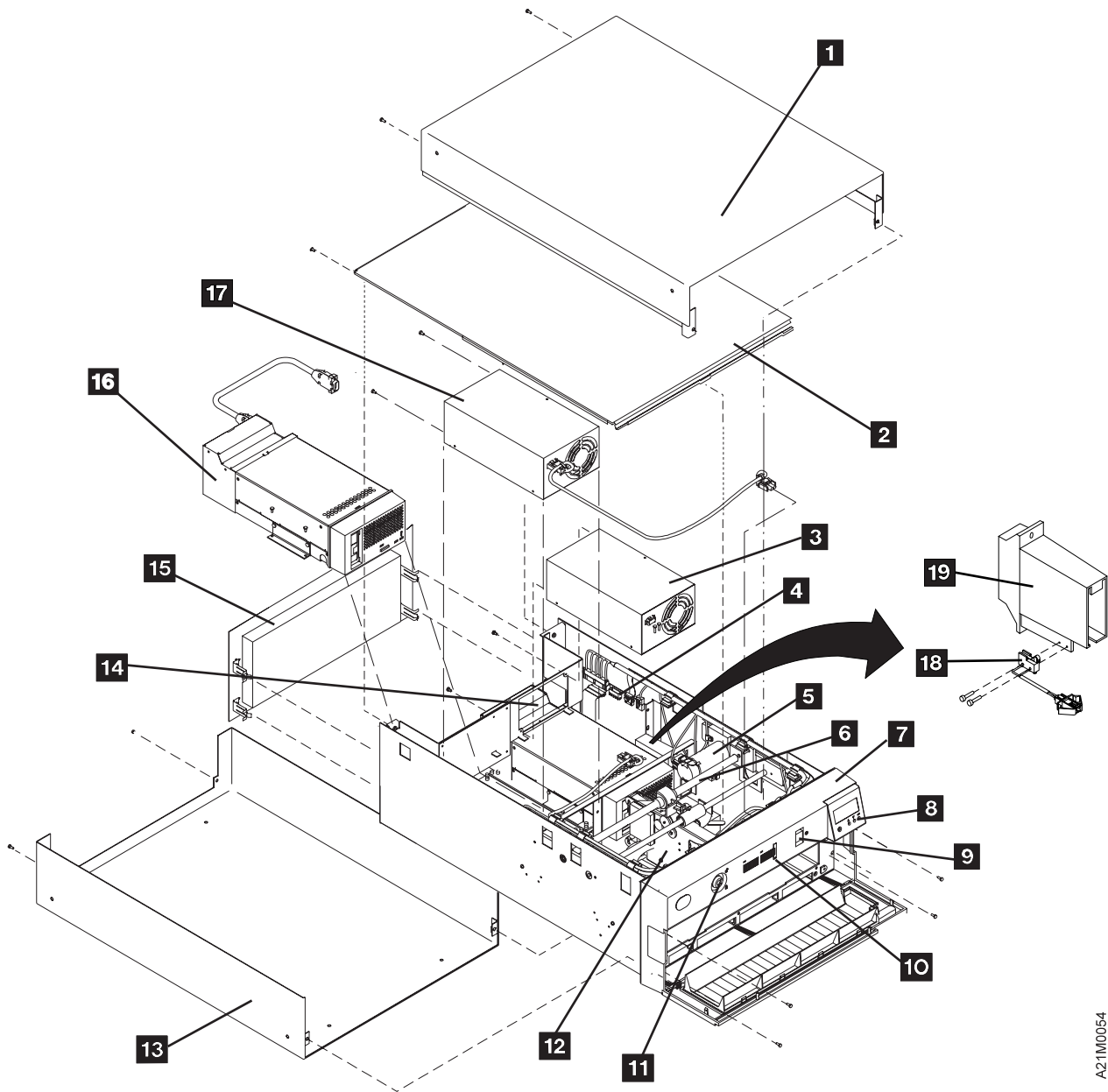


Figure 60. Model B11-Rack-Mounted Library Model

A21M0035

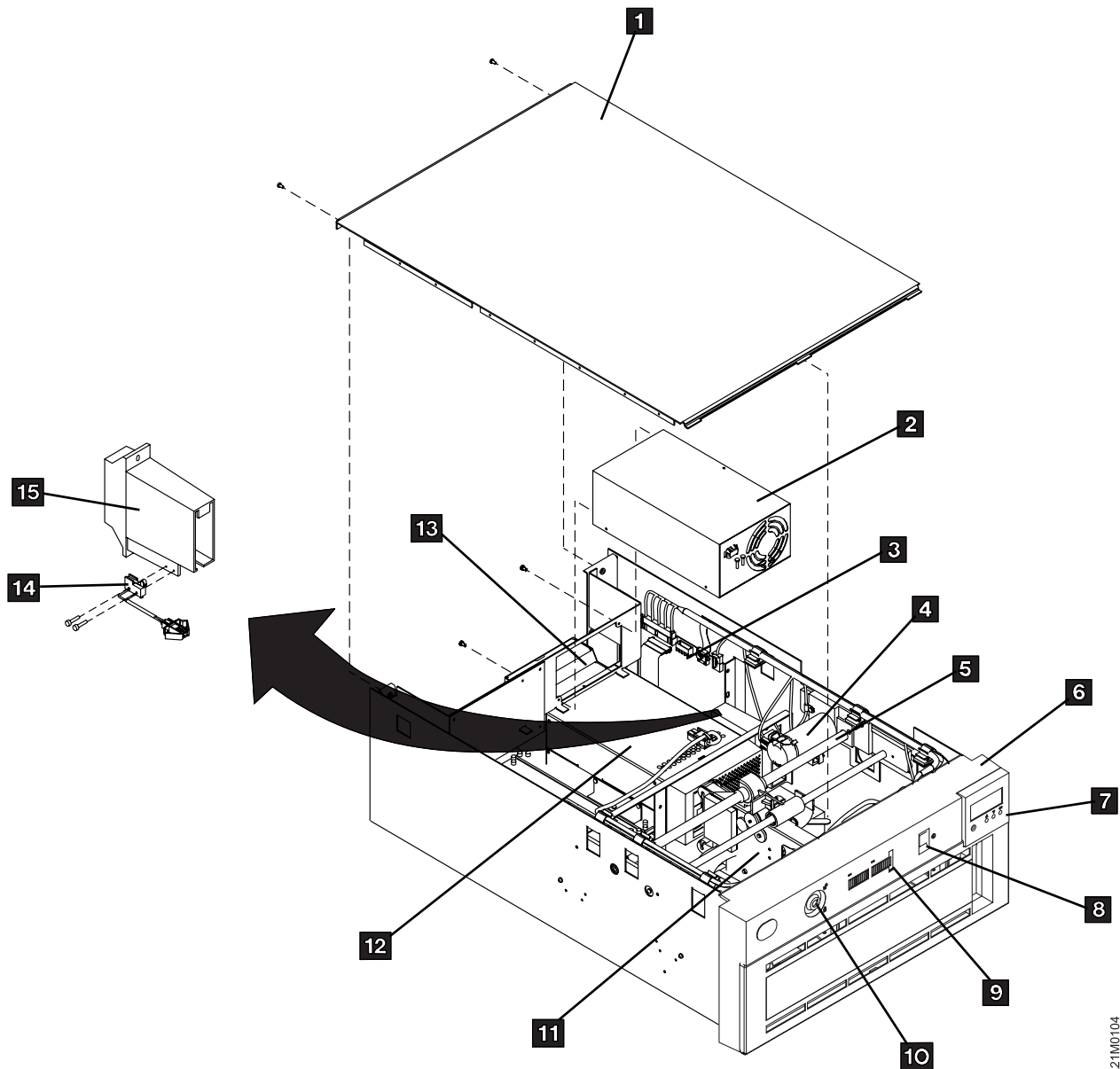


A21M0054

Figure 61. Model B12-Rack-Mounted Library Model

**Library Control Card:** The library control card, item 4, is the electronic interface to the accessor motor assembly, picker motor, operator display functions, and cartridge management. It is heavily dependent upon the drive logic card, located inside the drive pack, item 14 (drive 1) for microcode control and command generation which it passes on to the individual library components. A drive logic card is also present in the drive pack, item 16 (drive 2) which controls that drives components. It also passes on to the drive logic card sense data from the library components and tach counts from the library motors for control purposes.

An optional Bar Code Reader feature is available on all library models. When this feature is installed, the bar code reader card, mounted on the library control card, detects the presence of the feature for the microcode, thus requiring no special configuration to activate the feature. The bar code reader is mounted on the picker assembly and is connected to the bar code reader card through the library sensor cable.



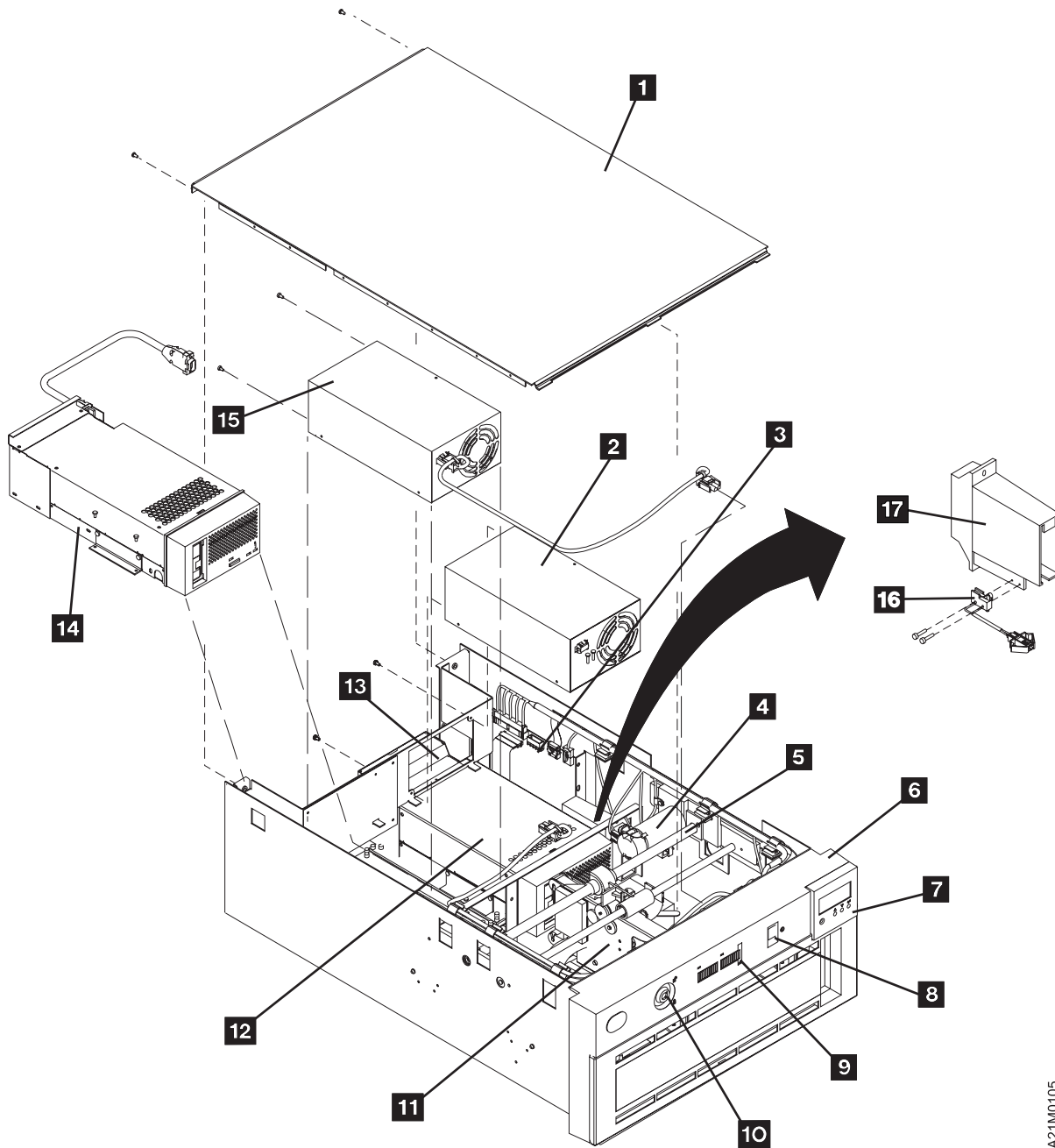
AZ1M0104

| Figure 62. Model B21 Rack-Mounted Library Model

**Accessor Assembly:** The accessor assembly, item 6, is made up of a screw shaft and guide shaft used to position the picker assembly, item 12 for access to all 20 magazine slots and to the drive unit slot. The accessor assembly is under control of the accessor motor assembly, item 5 for back and forth motion.

**Picker Assembly:** The picker assembly, item 12, rides on the screw shaft and is guided by the guide shaft back and forth to access any of 20 cartridge positions in the magazines or the drive unit. The picker grasps the desired cartridge from a magazine slot, moves to the drive door, and inserts the cartridge into the drive unit. When the drive unit is unloaded, the picker assembly moves to the drive, picks the tape cartridge from the drive unit, and places it back into a magazine at an appropriate slot location.

An optional Bar Code Reader feature is available on all library models that can read bar code labels on data cartridges. The reader is mounted on the picker assembly in a position that allows it to read the bar



A21M0105

| Figure 63. Model B22 Rack-Mounted Library Model

code label as a cartridge is moved through the picker. The electronic controls for the bar code reader are mounted on the library control card, item 4 .

The picker assembly, under program control, performs an inventory of the magazines to determine which slots, if any, contain tape cartridges, then sends that information back to the host processor.

**Library Front Cover Assembly:** The library front cover, item 7 , comes in two colors, black or white, and is the decorative cover for the front of the library device. It contains a security key lock, door open sensor (not shown), library LED card, item 1 , ac switch and cable assembly, item 9 , room for the library operator panel display, item 8 a magazine access door, a priority cell position, and two magazine assemblies and magazine locking hardware. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345* for location and functional description of the library.

**Library Sensors and Sensor Cable:** The library sensors and associated cable (not shown here) provide sensing for the following conditions:

- Magazine 1 and 2 are present
- Priority cell contains a tape cartridge
- Library front door has been opened
- Tape cartridge present in magazine cell
- Global interference
- Picker sensors
  - Cartridge present
  - Limit sensor
  - Pinch sensor
- Cleaner cartridge present

For a diagram of these sensors and their connections, see Figure 64 on page LIBRARY-23.

**Library Operator Panel Display:** The library operator panel display, item 8, is attached to the library control card by the library operator panel display cable. Both are FRUs.

**Picker Cable:** The picker cable is the flat cable on the bottom of the library base (not shown) that rides back and forth with the picker assembly. It is attached to the library control card.

**Library Interface Cable:** The library interface cable attaches the drive logic card to the library control card through the mother board.

**Library AC Switch and Cable Assembly:** The library ac switch and cable assembly, item 9 is housed in the library front cover and is connected to the power supply, item 3 (drive 1 power) and item 17 (drive 2 power). See Figure 28 on page INTRO-17 for power distribution.

**Cleaner Cell Assembly:** The cleaner cell, item 19, is located on the inside right wall of the library frame and is used to house the cleaner cartridge when it is not being used for cleaning the drive R/W head. The cleaner cell is directly reachable by the picker assembly when a cleaning cycle is needed.

**Magazine Global Sensor Pair:** The magazine global sensor pair is made up of a light source and a light sensor, and is used to sense one of two conditions:

Any cartridge that is extending too far into the picker path, between the picker and the magazine, and might cause an interference. This interference is ignored during loading and unloading of cartridges from the magazine.

Any cartridge that is placed into the magazine in the wrong orientation (upside down or backwards).

**Drive Global Sensor Pair:** The drive global sensor pair is made up of a light source and a light sensor, and is used to sense when a cartridge is extending too far into the picker path, between the picker and the drive, and might cause an interference. This interference is ignored during loading and unloading of cartridges from the drive.

**Library LED Card:** The library LED card, item 1 is attached directly behind three holes in the library front cover to allow Magazine 1 and 2 Busy indicators and Priority Cell in Use indicators to be visible to the operator. See *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models*, GA32-0345 for location and functional description of the library and all operator accessible functions.



## Data Flow and Cable Diagram – Library Models

Figure 64 shows the general data flow and cable diagram for the library models.

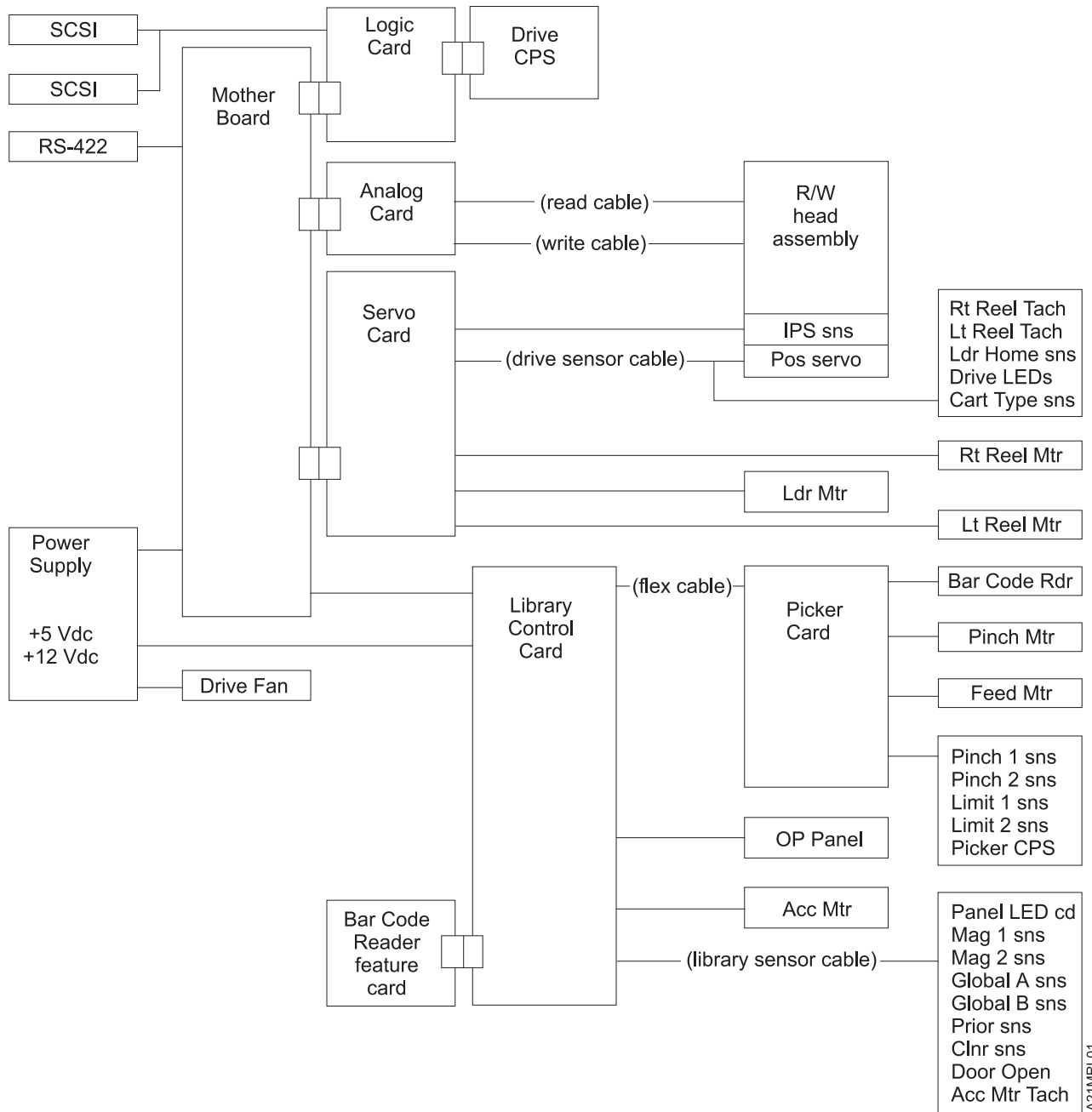


Figure 64. General Data Flow and Connectivity – &RACL Models



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# Messages

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## Service Information Messages (SIMs)

The SIM function is a primary factor in the 3570 maintenance plan for improved product availability.

A SIM alerts the customer when an abnormal operational condition in the 3570 requires service attention. Information in the SIM identifies the affected drive, the failing component and the severity of the fault condition, and the expected operational impact of the pending service action. This information helps the user to initiate and expedite appropriate recovery and service procedures so that normal operation is restored with maximum efficiency and minimal disruption.

A SIM contains the machine type, machine serial number, and FID that allows the dispatch of the appropriate service personnel and the replacement parts required to correct the machine fault. This procedure helps improve service response time and helps reduce the time required for machine repair.

Physical location identifiers in the SIM directs the CE to the failing unit in the customers account. The SIM FID code specifies the parts to be replaced and directs the CE to appropriate service procedures. This allows the machine fault to be repaired without first looking in log records and without having to try to recreate the failure with diagnostic procedures. Both of these advantages further contribute to reduced outage durations.

The detailed information within SIMs is for use by the dispatcher or the CE in the branch office. This individual is responsible for decoding the information and scheduling for service based on data content within the SIM.

The customer can select, depending on their software, the severities that they wish to see. For example, one customer may only want to see the *Acute* SIM and another customer may want to see all the SIMs that are sent to the host. The 4 severity codes follow:

Severity 0 (FID4) code means that the device needs service.

Severity 1 (FID3) code means that the problem is moderate.

Severity 2 (FID2) code means that the problem is serious.

Severity 3 (FID1) code means that the problem is acute.

A service message within the SIM also informs the customer what the service impact will be; for example, *impact unknown* disables access to the drive or requires the interface to be disconnected.

---

## Obtaining 3570 Drive Error Information at the Host

IBM device drivers for the RS/6000 and AS/400 systems log service information messages (SIMs) when an error occurs on a 3570 drive.

**Note:** Sun, HP-UX and Windows NT systems do not log SIM data.

The SIM includes the following error information:

1. Which drive the SIM refers to.
2. The FRU identifier (FID) code and FID severity for Drive errors. The FID is used to enter the START section where it specifies the failing FRU group.
3. The message code presented to the customer. See "Message Codes" on page MSG-9.
4. The first FSC, second FSC or flag bytes, model and microcode link level are not required to enter the START section. This support data may be requested by your next level of support.

This information is used to service the 3570 drive and can also be obtained directly from the library display. The PANEL section describes the 3570 display.

## 3570 Drive Display Panel

The following screen is an example of an error log display:

```
CE ERROR LOG
FID1 E4
A08F A0F9 2D40
005 17:00:15 +
```

```
FID1 EA          1 = FID Severity
                  E4 = FID
A08F A0F9       A08F = First FSC
                  A0F9 = Second FSC
2D40           2D40 = Model and Microcode Level

005 17:00:15    Time Stamp (not real time, but relative
                  to power-on time, except that the
                  time is saved in VPD each hour.)
```

A21MMS01

The following text explains how to obtain 3570 error information from the RS/6000, AS/400 and Sun platforms. If the utilities described below are not used on your system, please refer to the documentation that came with your system drivers.

See “Service Information Messages (SIMs)” on page MSG-2 for additional information on SIMs.

---

## Error Log Analysis, RS/6000

The AIX Tape and Medium Changer Device Driver for the RS/6000 provides logging to the system error log for a variety of errors. You can view the error log in various formats by using one of the following AIX commands:

**tapeutil** command on page MSG-3

**diag** command on page MSG-3

**smit** command on page “Sense Key D (Volume Overflow)” on page MSG-16

**errpt** command on page “Using SMIT/ERRPT Commands” on page MSG-17

Use the Hex to ASCII conversion in Figure 70 on page MSG-7. Examples of the different error log formats are shown following this text.

To use the **tapeutil** command:

**Note:** The **tapeutil** command gives you a detailed report by device only.

1. Type **tapeutil** at the AIX command line.
2. Select **Tape Drive Service Aids** (listed under General Commands) from the menu.
3. Select **Error Log Analysis** from the Service Aid menu.
4. Select the device from the Drive Selection menu and press PF7 to commit. The error log will be displayed.
5. You can scroll through the log by pressing the Enter key.

To use the **diag** command:

**Note:** You must have root authority to run the AIX **diag** command.

**Note:** The **diag** command gives you a detailed report by device only.

1. Type **diag** at the AIX command line.
2. Select **Service aids** from the Diagnostic Function Selection menu.
3. Select **IBM Tape Drive Service Aids** from the Service Aid Selection menu.
4. Select **Error Log Analysis** from the Service Aid menu.
5. Select the device from the Selection menu and press PF7 to commit. The error log will be displayed.
6. You can scroll through the log by pressing the Enter key.

Analyse Sense Key and ASC/ASCQ data to determine the type of Sense Information reported in the Error Log. If hardware failure is indicated, use the FID and go to START-1 for problem determination. For errors that indicate SCSI adapter or SCSI bus errors, see Figure 68 on page MSG-6, go to "SCSI Bus Problem Determination" on page PROC-86.

For errors indicating system problems, enter the appropriate maintenance package.

```

IBM Tape Device Error Log Analysis

NAME: rmt1   LOCATION: 00-02-01-20   DEVICE TYPE: 3570

DATE: 10/31/95 07:33:21   SEQUENCE #203274   ERROR ID: HARDWARE ERROR

SCSI CDB: 0A0100001400

SCSI STATUS BYTE: CHECK CONDITION   SENSE KEY: 4   ASC/ASCQ: 4400
SCSI SENSE BYTES 0-17:

    1
    ┌───┐
    │ 710001000000000400000000004400E408A08F │
    │ 2   3   4 │
    └───┘

SCSI EXTENDED SENSE BYTES:

    5
    ┌───┐
    │ 4132030101000000724100000A50053343000E00000000A0F900000000000000 │
    │                                6 ───┘
    │                                │ 4438362020202000 │
    └───┘

Press ENTER for additional entries...

F3=Cancel        F10=Exit        Enter

```

	HEX	ASCII	Description
1	1		Sense Key Byte 2
2	44		ASC/ASCQ (additional sense code/additional sense code qualifier) Byte 12 and 13 (See "Sense Key, ASC and ASCQ Information" on page MSG-11, for error sense information.)
3	E4		FID (PRU identification number) Byte 14
4	A 8F		First FSC (fault symptom code) Bytes 16 and 17
5	A F9		Second FSC (fault symptom code) Bytes 41 and 42
6	443836	D86	Microcode link level Bytes 72 and 73
	NOT SHOWN		VOLSER# in ASCII/EBCDIC Bytes 83 through 88

Figure 65. AIX TAPEUTIL and DIAG Commands Error Log Example

IBM Tape Device Error Log Analysis

NAME: rmt1 LOCATION: 00-02-01-20 DEVICE TYPE: 3570

DATE: 10/31/95 07:33:21 SEQUENCE #203274 ERROR ID: 3570 SIM/MIM PAGE

SIM/MIM DATA:

```

310000440000614001130303030303030314438363431303037373230303030303045383338
303933383039383030304942D31332D303030303030303030303331353033353730423131

```

Press ENTER for additional entries...

F3=Cancel F10=Exit Enter

A21MMS03

Figure 66. AIX TAPEUTIL and DIAG Commands SIM Error Log Example

O F F S E T

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00-0F	Page Code 31	RSVD 00	Length 00 44	Parm Code 00 00	Parm Ctrl 61	Parm Length 40	SIM or MIM 1	Reserved								
10-1F	Microcode and Link Level 2			Message Code 3	Reserved		Excp Msg 4	SRVC Msg 5	Sev 6	RSVD	Exception Data	FRU Identifier 7				
20-2F	FRU Identifier (cont)	First FSC 8			Last FSC 9			Product ID 38 30 30 30			Manufacturer					
30-3F	Mfg (cont)	Plant of Manufacture	Dash 20	SEQUENCE NUMBER (Drive Serial number) 10												
40-4F	Device Type 30 33 35 39 30				Device Model Number 11											

SIMFORM1

1 SIM/MIM Present    9 Device Model Number    3 Message Code  
 No SIM or MIM present    423 3 B (Drive-Only)    See "Message Codes" on page MSG-9  
 1 SIM present    423 31 B 1 (Stand-Alone Library)  
 2 MIM present    423131 B11, B21 (Rack-Mounted Library)  
                   423 32 B 2 (Stand-Alone Library with 2 drives)  
                   423132 B12, B22 (Rack-Mounted Library with 2 drives)

4 Exception Messages  
 See "SIM Exception Messages" on page MSG-9

5 Service Message  
 See "SIM Service Messages" on page MSG-9

6 Severity  
 See "FID Severity" on page MSG-11

Figure 67. SIM Format

```

IBM Tape Device Error Log Analysis
NAME: rmt1  LOCATION:  - 2- 1-2  DEVICE TYPE: &357 ;
DATE: 1 /31/95  7:33:21  SEQUENCE #2 3274  ERROR ID: SCSI ADAPTER ERROR
SCSI CDB: 17
SCSI ADAPTER ERROR: COMMAND TIMEOUT
Press ENTER for additional entries...

F3=Cancel          F1 =Exit          Enter

```

Figure 68. AIX TAPEUTIL and DIAG commands error log example

## Running Tapeutil

If **tapeutil** is running and an error condition is detected, an error message is displayed. The error sense data has the format seen in Figure 69. The **errno**, or error number, is explained in Figure 71 on page MSG-8.

```

Read/Write test terminated, total bytes written
Operation failed with errno 5: I/O error
Residual count: 2 48

Error Sense Data, Length 8

      1  2 3  4 5  6 7  8 9  A B  C D  E F
      - 71  4          4          44  E4 3  [q.....@....D.ö.]
1 - A 8F  21  2 1  1          A  [!...!.....]
2 -                                     [.....]
3 -                                     [.....]
4 -                                     [.....D86 .]

```

HEX	ASCII	DESCRIPTION
E4		FID (FRU identification number) Byte 14
A 8F		FSC (fault symptom code) Bytes 16 and 17
443836	D86	Microcode level Bytes 72 through 74
NOT SHOWN		VOLSER# in ASCII/EBCDIC Bytes 83 through 88

Figure 69. Tape Util Error Sample



Figure 70. Hex to ASCII Conversion

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	Null	30	0	41	A	4A	J	54	T
20	Space	31	1	42	B	4B	K	55	U
		32	2	43	C	4C	L	56	V
		33	3	44	D	4D	M	57	W
		34	4	45	E	4E	N	58	X
		35	5	46	F	4F	O	59	Y
		36	6	47	G	50	P	5A	Z
		37	7	48	H	51	Q	5F	-
		38	8	49	I	52	R		
		39	9			53	S		

**Note:** All codes are not shown.

MSG

Figure 71 shows only the **errno** values pertaining to tape devices. The complete list of **errno** values can be found in the AIX `/usr/include/sys/errno.h` header file.

<i>Figure 71. Device Driver to AIX ERRNO Translation</i>		
<b>AIX errno</b>	<b>Device Driver Error Code</b>	<b>Description</b>
1	EPERM	<b>General:</b> The process does not have adequate permission to perform the desired function.
5	EIO	<b>Open:</b> An I/O error occurred that indicates a failure to operate the device. <b>Write:</b> The physical end of medium was detected, or it is a general error state indicating a failure to write to device. <b>IOCTL:</b> An I/O error occurred during the operation. <b>Close:</b> An I/O error occurred during the operation.
6	ENXIO	<b>General:</b> The device has not been configured and is not receiving requests. <b>Write:</b> A write operation was attempted after the device had reached end of medium.
9	EBADF	<b>General:</b> A bad file descriptor was passed. <b>Write:</b> A write operation was attempted on a device that was opened for read only.
11	EAGAIN	<b>Read:</b> The device is already opened.
12	ENOMEM	<b>General:</b> Insufficient memory available for some internal memory operation. <b>Read:</b> The number of bytes requested in a read of a variable block record was less than the size of the block. This is referred to as an over-length condition.
14	EFAULT	<b>General:</b> A memory failure occurred due to an invalid pointer or address.
16	EBUSY	<b>General:</b> An excessive busy state was encountered. <b>Open:</b> The device is reserved by another initiator or an excessive busy state was encountered.
22	EINVAL	<b>Open:</b> The operation requested had invalid parameters or an invalid combination of parameters. <b>Write:</b> The operation requested had invalid parameters or an invalid combination of parameters, or the number of bytes requested in the write was not a multiple of the block size for a fixed block transfer, or the number of bytes requested in the write was greater than the maximum block size allowed by the device for variable block transfers.
28	ENOSPC	<b>Write:</b> A write operation failed because it had reached the early warning mark while running in label processing mode. This return code is only returned once at the moment early warning is reached.
46	ENOTREADY	<b>General:</b> The device is not ready for operation or a tape is not in the drive. <b>Open:</b> If not opened with the O_NONBLOCK or O_NDELAY, the drive is not ready for operation or there is no tape in drive. If the non-blocking flags are used, the drive is not ready for operation.
47	EWRPROTECT	<b>Open:</b> An open operation with the O_RDWR or O_WRONLY flag was attempted on a write-protected tape. <b>Write:</b> A write operation was attempted on a write-protected tape. <b>IOCTRL:</b> An operation that would modify the media was attempted on a write-protected tape or a device that was opened for O_RDONLY.
78	ETIMEDOUT	<b>General:</b> A command has timed out.
110	EMEDIA	<b>General:</b> An unrecoverable media error was detected.

## Message Codes

Figure 72. Message Code Descriptions

Message Code Hex	Message Code ASCII	Description
3030	00	<b>No Message:</b> This is the default message indicating that the device does not have an error to report.
3430	40	<b>Operator Intervention Required:</b> An operator action is required at the device. For example, a magazine is full and needs to be replaced or emptied. Check the device error log for possible repair action. See “3570 Drive Display Panel” on page MSG-3 and also the PANEL section describes the 3570 display.
3431	41	<b>Device Degraded:</b> The device is performing in a degraded state, but can be used. A FID is displayed with the error message. Check the device error log for possible repair action. See “3570 Drive Display Panel” on page MSG-3 and also the PANEL section describes the 3570 display.
3432	42	<b>Device Hardware Failure:</b> The device can not be used. A FID is displayed with the error message. Check the device error log for possible repair action. See “3570 Drive Display Panel” on page MSG-3 and also the PANEL section describes the 3570 display.
3433	43	<b>Service Circuits Failed, Operations not Affected:</b> This error does not affect the performance of the device. The failure only affects circuits used for nonoperational testing. A FID is displayed with the error message. Check the device error log for possible repair action. See “3570 Drive Display Panel” on page MSG-3 and also the PANEL section describes the 3570 display.
3535	55	<b>Clean Device:</b> Load a cleaning cartridge in the device. The drive returns the cleaning cartridge following the cleaning procedure.
3537	57	<b>Device has been cleaned:</b> The drive has been cleaned by a cleaning cartridge.
3732	72	<b>Replace Cleaner Cartridge:</b> MIM Message.

## SIM Exception Messages

Figure 73. Exception Message Descriptions

Exception Message Hex	Exception Message ASCII	Description
30	0	Reserved
31	1	Effect of failure unknown
32	2	Dev. Exception — No performance impact
33	3	Dev. Exception on interface
34	4	Dev. Exception on RACL
35	5	Dev. Exception on Operator Panel
36	6	Dev. Exception on Tape path
37	7	Dev. Exception in Drive
38	8	Dev. Preventive Maintenance Required
39–3F	9–F	Reserved

## SIM Service Messages

Figure 74. SIM Service Message Descriptions

<b>Service Message Hex</b>	<b>Service Message ASCII</b>	<b>Description</b>
30	0	Reserved
31	1	Repair impact is unknown
32-36	2	Reserved
37	7	Repair will disable access to Dev.
38	8	Repair will disable message display ids on Dev.
39	9	Dev. Cleaning Required
3A	A	Dev. Cleaning Complete
3B-3F	B-F	Reserved

## FID Severity

Figure 75. FID Severity Descriptions

FID Severity HEX	FID Severity ASCII	FID Severity Algorithm	FID Severity Real	Description
33	3	4-3=1	1	<b>Acute:</b> Device requires immediate attention. Device is unusable.
32	2	4-2=2	2	<b>Serious:</b> Device is usable but is seriously degraded.
31	1	4-1=3	3	<b>Moderate:</b> Device is usable but is running degraded.
30	0	4-0=4	4	<b>Service:</b> Device needs scheduled maintenance but is usable.

## Sense Key, ASC and ASCQ Information

The following tables list all possible combinations of Sense Keys, Additional Sense Codes (ASC), and Additional Sense Code Qualifiers (ASCQ) that are reported by the 3570. See *IBM Magstar MP 3570 Tape Subsystem Hardware Reference, B-Series Models, GA32-0365-01* for additional information.

### Sense Key 0

Figure 76. ASC, and ASCQ Summary for Sense Key 0 (No Sense)

ASC ASCQ	Description	Drive	Library
00 00	No Additional Sense Information - EOM	X	
00 00	No Additional Sense Information - ILI	X	
00 00	No Additional Sense Information - FM	X	
00 01	Filemark Detected	X	
00 04	Beginning-of-Partition or Medium Detected	X	

### Sense Key 1 (Recovered Error)

Figure 77. ASC, and ASCQ Summary for Sense Key 1 (Recovered Error)

ASC ASCQ	Description	Drive	Library
00 00	No Additional Sense Information	X	X
00 17	Drive Needs Cleaning	X	
0A 00	Error Log Overflow	X	
17 01	Recovered Data with Retries	X	
18 00	Recovered Data with Error Correction Applied	X	
37 00	Rounded Parameter	X	
5B 01	Threshold Condition Met	X	
5B 02	Log Counter at Maximum	X	

## Sense Key 2 (Not Ready)

Figure 78. ASC, and ASCQ Summary for Sense Key 2 (Not Ready)

ASC ASCQ	Description	Drive	Library
04 00	Logical Unit Not Ready, Cause Not Reportable	X	X
04 01	Logical Unit Is in Process of Becoming Ready	X	X
04 03	Logical Unit Not Ready, Manual Intervention Required	X	X
04 04	Logical Unit Not Ready, Format in Progress	X	
04 85	Open Door		X
04 8D	In Manual (Sequential) Mode		X
04 8E	In Automatic (Sequential) Mode		X
15 01	Mechanical Positioning Error, Manual Intervention Required		X
30 03	Cleaning in Progress	X	
3A 00	Medium Not Present	X	
53 00	Media Load or Eject Failed	X	

## Sense Key 3 (Medium Error)

Figure 79. ASC, and ASCQ Summary for Sense Key 3 (Medium Error)

ASC ASCQ	Description	Drive	Library
03 02	Excessive Write Errors	X	
09 00	Track Following Error	X	
0C 00	Write Error	X	
11 00	Unrecovered Read Error	X	
11 01	Read Retries Exhausted	X	
11 08	Incomplete Block Read	X	
14 00	Recorded Entity Not Found	X	
14 01	Record Not Found	X	
14 02	Filemark or Setmark Not Found	X	
14 03	End-of-Data Not Found	X	
14 04	Block Sequence Error	X	
30 00	Incompatible Medium Installed	X	
30 01	Cannot Read Medium, Unknown Format	X	
30 02	Cannot Read Medium, Incompatible Format	X	
31 00	Medium Format Corrupted	X	
31 01	Format Command Failed	X	
33 00	Tape Length Error	X	
51 00	Erase Failure	X	
85 00	Write Protected Because of Tape or Drive Failure	X	
85 01	Write Protected Because of Tape Failure	X	
85 02	Write Protected Because of Drive Failure	X	



## Sense Key 4 (Hardware Error)

Figure 80. ASC, and ASCQ Summary for Sense Key 4 (Hardware Error)

ASC ASCQ	Description	Drive	Library
09 00	Track Following Error	X	
15 01	Mechanical Positioning Error	X	
3B 00	Sequential Positioning Error	X	
3B 08	Reposition Error	X	
40 00	Diagnostic Failure	X	
44 00	Internal Target Failure	X	X
4C 00	Logical Unit Failed Self-Configuration	X	
52 00	Cartridge Fault	X	
53 00	Media Load or Eject Failed	X	
53 01	Unload Tape Failure	X	

## Sense Key 5 (Illegal Request)

Figure 81. ASC, and ASCQ Summary for Sense Key 5 (Illegal Request)

ASC ASCQ	Description	Drive	Library
1A 00	Parameter List Length Error	X	X
20 00	Invalid Command Operation Code	X	X
21 01	Invalid Element Address		X
24 00	Invalid Field in CDB	X	X
25 00	Logical Unit Not Supported	X	X
26 00	Invalid Field in Parameter List	X	X
26 01	Parameter Not Supported	X	
26 02	Parameter Value Invalid	X	
26 03	Threshold Parameters Not Supported	X	
2C 00	Command Sequence Error	X	
39 00	Saving Parameters Not Supported	X	
3B 0D	Medium Destination Element Full		X
3B 0E	Medium Source Element Empty		X
3B 11	Medium Magazine Not Accessible		X
3B 80	Medium Transport Element Full		X
3D 00	Invalid Bits in Identify Message	X	X
53 02	Medium Removal Prevented	X	X
5B 03	Log List Codes Exhausted	X	
80 00	CU Mode, Vendor-Unique	X	X
85 03	Write Protected Because of Current Tape Position	X	



## Sense Key 6 (Unit Attention)

*Figure 82. ASC, and ASCQ Summary for Sense Key 6 (Unit Attention)*

ASC ASCQ	Description	Drive	Library
00 02	End-of-Partition/Medium Detected, Early Warning	X	
28 00	Not Ready to Ready Transition, Medium May Have Changed	X	X
28 01	Import or Export Element Accessed		X
28 80	Not Ready to Ready Transition, Medium Changer		X
29 00	Power On, Reset, or Bus Device Reset Occurred	X	X
2A 01	Mode Parameters Changed	X	X
2A 02	Log Parameters Changed	X	
2F 00	Commands Cleared by Another Initiator	X	
30 00	Incompatible Medium Installed	X	
3B 12	Medium Magazine Removed		X
3B 13	Medium Magazine Inserted		X
3B 14	Medium Magazine Locked		X
3B 15	Medium Magazine Unlocked		X
3F 01	Microcode Has Been Changed	X	X
3F 02	Changed Operating Definition	X	X
3F 03	Inquiry Data Has Changed	X	X
5A 01	Operator Medium Removal Request	X	
82 83	Cleaning Completed, Cleaning Cartridge Ejected	X	

## Sense Key 7 (Data Protect)

*Figure 83. ASC, and ASCQ Summary for Sense Key 7 (Data Protect)*

ASC ASCQ	Description	Drive	Library
27 00	Write Protected	X	

## Sense Key 8 (Blank Check)

Figure 84. ASC, and ASCQ Summary for Sense Key 8 (Blank Check)

ASC ASCQ	Description	Drive	Library
00 05	End-of-Data Detected	X	
14 01	Record Not Found, Void Tape	X	

## Sense Key B (Aborted Command)

Figure 85. ASC, and ASCQ Summary for Sense Key B (Aborted Command)

ASC ASCQ	Description	Drive	Library
14 00	Recorded Entity Not Found	X	
14 01	Record Not Found	X	
14 02	Filemark or Setmark Not Found	X	
1B 00	Synchronous Data Transfer Error	X	X
43 00	Message Error	X	X
44 00	Internal Target Failure	X	X
45 00	Select or Reselect Failure	X	X
47 00	SCSI Parity Error	X	X
48 00	Initiator Detected Error Message Received	X	X
49 00	Invalid Message Error	X	X
4A 00	Command Phase Error	X	X
4B 00	Data Phase Error	X	X
4E 00	Overlapped Commands Attempted	X	X

## Sense Key D (Volume Overflow)

Figure 86. ASC, and ASCQ Summary for Sense Key D (Volume Overflow)

ASC ASCQ	Description	Drive	Library
00 02	End-of-Partition/Medium Detected	X	

## Using SMIT/ERRPT Commands

To use the **smit** command:

**Note:** The **smit** command has various ways to format the error log.

1. Type **smit** at the AIX command line.
2. Select **Problem Determination** from the System Management menu.
3. Select **Error Log** from the Problem Determination menu.
4. Select **Generate Error Report** from the Error Log menu.
5. Select **filename**, then select **no** from the Single Select list.
6. From the Generate Error Report menu you can select the type of reports you want to view, then press the **Do** icon.
7. You can scroll through the log by using the up or down icons on the menu.

To use the **errpt** command:

1. Select **errpt jpg** at the AIX command line. The summary report will be displayed.
2. You can scroll through the log by pressing the Enter key for the next page.
3. You can type **q** to quit the error log at any time.

Or,

Or,

1. Type **errpt -a jpg** at the AIX command line. The detailed report will be displayed.
2. You can scroll through the log by pressing the Enter key for the next page.
3. You can type **q** to quit the error log at any time.

Analyse Sense Key and ASC/ASCQ data to determine the type of Sense Information Reported in Error Log. If hardware failure is indicated, use the FID, go to START-1 for problem determination. For errors that indicate SCSI adapter or SCSI bus errors, see Figure 68 on page MSG-6, go to “SCSI Bus Problem Determination” on page PROC-86.

For errors indicating system problems, enter the appropriate maintenance package.

Figure 87. Hex to ASCII Conversion

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	Null	30	0	41	A	4A	J	54	T
20	Space	31	1	42	B	4B	K	55	U
		32	2	43	C	4C	L	56	V
		33	3	44	D	4D	M	57	W
		34	4	45	E	4E	N	58	X
		35	5	46	F	4F	O	59	Y
		36	6	47	G	50	P	5A	Z
		37	7	48	H	51	Q	5F	-
		38	8	49	I	52	R		
		39	9			53	S		

**Note:** All codes are not shown.

```

ERROR LABEL:    TAPE_ERR2
ERROR ID:       476B35ID

Date/Time:     Tue Oct 31 07:33:21
Sequence Number: 203274
Machine ID:    000003243700
Node ID:       kitt
Error Class:   H
Error Type:    PERM
Resource Name: rmt1
Resource Class: tape
Resource Type: 3570
Location:      00-02-01-20
VPD:

Manufacturer.....IBM
Machine Type and Model.....03570B11
Serial Number.....000000000315
Device Specific . (FW) .....4D86

```

```

Error Description
TAPE DRIVE FAILURE

```

```

Probable Causes
TAPE DRIVE

```

```

Failure Causes
TAPE
TAPE DRIVE

```

```

Recommended Actions
PERFORM PROBLEM DETERMINATION PROCEDURES

```

```

Detailed Data
SENSE DATA
0604 0000 1101 FFFF FE00 0000 0000 0000 0102 0000 7000 0400 0000 0048 0000 0000
4400 E403 A08F 004A 1E01 0191 004A 8250 0000 1100 0036 2800 0033 4D00 00A0 F900
0000 0000 0190 0000 2700 0000 0020 0000 0000 0000 0000 0000 C700 0000 4438 3620
2020 2000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

```

A21MMS07

HEX	ASCII	Description
4		Sense key
44		ASC/ASCQ (additional sense code/additional sense code qualifier) (See "Sense Key, ASC and ASCQ Information" on page MSG-11 for error sense information.)
E4		FID (FRU identification number)
A 8F		First FSC (fault symptom code)
3628		Second FSC (fault symptom code)
334D		Next to LAST FSC
A F9		LAST FSC
443836	D86	Microcode link level

Figure 88. AIX SMIT and ERRPT Command Error Log Example

```

ERROR LABEL:    SIM_MIM_RECORD_3570
ERROR ID:       2E2EFDDE

Date/Time:     Tue Oct 31 07:33:21
Sequence Number: 203274
Machine ID:    000003243700
Node ID:       kitt
Error Class:   H
Error Type:    UNKN
Resource Name: rmt1
Resource Class: tape
Resource Type: 3570
Location:      00-02-01-20
VPD:

Manufacturer.....IBM
Machine Type and Model.....03570B11
Serial Number.....000000000315
Device Specific . (FW) .....4D86
  
```

Error Description  
UNDETERMINED ERROR

Probable Causes  
TAPE DRIVE  
TAPE CONTROL UNIT

Failure Causes  
TAPE DRIVE

Recommended Actions  
PERFORM PROBLEM DETERMINATION PROCEDURES  
RUN DIAGNOSTICS AGAINST THE FAILING DEVICE  
CONTACT APPROPRIATE SERVICE REPRESENTATIVE

Detailed Data  
DIAGNOSTIC EXPLANATION

```

          1           2           3           4
          [ ]         [ ]         [ ]         [ ]
3100 0044 0000 6140 0130 3030 3030 3030 3144 3836 3431 3030 3737 3230 3030 3030
4534 4130 3846 4130 4639 3830 3030 4942 4D50 4D2D 5365 7175 656E 6365 4E75 6D00
          [ ]         [ ]         [ ]         [ ]
          5           6           7
  
```

AZ1MMS08

	HEX	ASCII	Description
1	1		1=SIM 2=MIM
2	31443836	1D86	Model and Microcode link level
3	3431	41	Message code (See "Message Codes" on page MSG-9))
4	32	2	FID severity (See "FID Severity" on page MSG-11)
5	4534	E4	FID (FRU identification number)
6	413 3846	A 8F	First FSC (fault symptom code)
7	413 4639	A F9	Last FSC (fault symptom code)

Figure 89. Error Log Example of SIM Message

```

ERROR LABEL:      RECIVERED_ERROR
ERROR ID:         0F78A011

Date/Time:       Mon Nov 20 07:33:21
Sequence Number: 232646
Machine ID:      000003243700
Node ID:         kitt
Error Class:     H
Error Type:      TEMP
Resource Name:   rmt1
Resource Class:  tape
Resource Type:   3570
Location:        00-02-01-20
VPD:

Manufacturer.....IBM
Machine Type and Model.....03570B11
Serial Number.....000000000315
Device Specific . (FW) .....4D86

Error Description
RECOVERY LOGIC INITIATED BY DEVICE

Probable Causes
UNDETERMINED

Failure Causes
TAPE DRIVE
MEDIA

Recommended Actions
THIS ALERT IDENTIFIES THE CAUSE OF A PREVIOUS ERROR WHICH HAS BEEN RECOVERED

Detailed Data
SENSE DATA
0602 0000 0A01 0000 1400 0000 0000 0000 0102 0000 7100 0100 0000 0040 0000 0000
4400 E408 A08F 4132 0301 0100 0000 7241 0000 0A50 0533 4300 0E00 0000 00A0 F900
0000 0000 0000 FFFF FF00 0000 0000 0000 0000 0000 0000 0000 0000 0000 4438 3620
2020 2000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

```

IA21MMS09

HEX	ASCII	Description
1		Sense Key
E4		FID (FRU identification number)
44		ASC/ASCQ
A 8F		First FSC (fault symptom code)
3343		Second FSC (fault symptom code)
		Next to Last FSC (fault symptom code)
A F9		Last FSC (fault symptom code)
443836	D86	Microcode level

Figure 90. AIX SMIT and ERRPT Command Error Log Example

1	2	3	4	5	6
0502F666	1003075695	P	H	scsi0	ADAPTER ERROR
0502F666	1003075595	P	H	scsi0	ADAPTER ERROR
1104AA28	1003075495	T	S	SYSPROC	System reset interrupt received
9DBCFDDE	1003075795	T	O	errdemon	Error logging turned on
0F78A011	1003075195	T	H	rmt1	Recovery logic initiated by device
4865FA9B	1003074995	P	H	rmt1	TAPE OPERATION ERROR
476B351D	1003074995	P	H	rmt1	TAPE DRIVE FAILURE
2E2EFDDE	1003074995	U	H	rmt1	UNDETERMINED EFFOR
476B351D	1003074995	P	H	rmt1	TAPE DRIVE FAILURE
2E2EFDDE	1003074995	U	H	rmt1	UNDETERMINED ERROR
2E2EFDDE	1003074995	U	H	rmt1	UNDETERMINED ERROR
0502F666	1003074495	P	H	scsi0	ADAPTER ERROR
0502F666	1003074395	P	H	scsi0	ADAPTER ERROR
1104AA28	1003074395	T	S	SYSPROC	System reset interrupt received
9DBCFDDE	1003074595	T	O	errdemon	Error logging turned on
4865FA9B	1003073795	P	H	rmt1	TAPE OPERATION ERROR
476B351D	1003073795	P	H	rmt1	TAPE DRIVE FAILURE
2E2EFDDE	1003073795	U	H	rmt1	UNDETERMINED ERROR
476B351D	1003073795	P	H	rmt1	TAPE DRIVE FAILURE
2E2EFDDE	1003073595	U	H	rmt1	UNDETERMINED ERROR
AA8AB241	1003030195	T	O	OPERATOR	OPERATOR NOTIFICATION
AA8AB241	1002030195	T	O	OPERATOR	OPERATOR NOTIFICATION
AA8AB241	1001030195	T	O	OPERATOR	OPERATOR NOTIFICATION
FCA960CE	1001001395	T	S	tok0	EXCESSIVE TOKEN-RING ERRORS
20188DE1	0928091195	P	H	tok0	WIRE FAULT
476B351D	0927132795	P	H	rmt1	TAPE DRIVE FAILURE
476B351D	0927132795	P	H	rmt1	TAPE DRIVE FAILURE
476B351D	0927132695	P	H	rmt1	TAPE DRIVE FAILURE
476B351D	0927132695	P	H	rmt1	TAPE DRIVE FAILURE
5537AC5F	0927132495	P	H	rmt1	TAPE DRIVE FAILURE

MSG

A21MMS10

NUMBER	DESCRIPTION
1	Error ID
2	Timestamp
3	Error Type
4	Error Class
5	Resource Name
6	Error Description

ERROR CLASS	DESCRIPTION
H	Hardware
S	Software
O	Informational

ERROR TYPE	DESCRIPTION
PEND	The availability loss of a device or component is imminent.
PERF	The performance of a device or component has degraded to an unacceptable level.
PERM	A hardware or software condition that could not be recovered from.
TEMP	A hardware condition that was recovered from after several unsuccessful attempts.
UNKN	The severity of the condition could not be determined.

A21MMS16

Figure 91. AIX SMIT and ERRPT Commands Error Log Example

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## Sun Error Logs

The Sun system does not provide error logs for analysis; therefore, you will have to use the device diagnostics and Device Error Log for problem determination. See Figure 68 on page MSG-6 and also the PANEL section describes the 3570 display. When you have located a FID, go to START-1.

| You may refer to APPENDIX A which contains additional information concerning host attachment software service tools for Sun (Solaris), including *tapeutil*.

See *IBM SCSI Tape Drive, Medium Driver and Library Device Drivers: Installation and Users Guide*, GC35-0154 for additional information about Solaris service and diagnostic aids.

---

## Obtaining Error Information from an HP/UX System

| The HP-UX system does not provide error logs for analysis; therefore, you will have to use the device diagnostics and Device Error Log for problem determination. See “CE Logs Menu” on page PANEL-44 and “Error Log Analysis Procedure” on page PROC-48. When you have located a FID, go to START-1.

| You may refer to APPENDIX A which contains additional information concerning host attachment software service tools for HP-UX systems, including *tapeutil*.

See *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154 for additional information about HP/UX service and diagnostic aids.

---

## Obtaining Error Information from a Windows NT System

| You may refer to APPENDIX A which contains additional information concerning host attachment software service tools for Windows NT systems, including *ntutil*.

See *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154 for additional information about Windows NT service and diagnostic aids.

## Running NT Util

| If **ntutil** is running and an error condition is detected, an error message is displayed. The error sense data has format seen in Figure 101 on page MSG-30. The **err 0 ERROR\_Success>**. or error number, is explained in “NTUTIL Symbolic Error and Error Number” on page MSG-31.



## Error Log Analysis, AS/400

To gain access to the AS/400 Problem logs and error logs, sign on at any available workstation using the QSRV logon and its security password (QSRV). After sign on, the proper access authorizations will be granted and the AS/400 MAIN MENU will be displayed.

There are two procedures depending on which version/release of OS/400 you are running.

### AS/400 System with CISC Processor

1. Type STRSST (Start System Service Tools) command on the command entry line on the AS/400 Main Menu and press enter.
2. Select "Start a service tool".
3. Select "Error log utility".
4. Select "Analyze error log".
5. Specify the time period for searching the error log, then select "Magnetic media".
6. On the Select Analysis Report Options menu, specify a device type of 3570 and press enter. Leave all other options at their default value.
7. Use the "Display report" option to display the desired error log entry.
8. The following figure is a sample AS/400 Error Log display screen showing the 3570 error log data.

```

Display Detail Report for Resource

Resource      Type      Model      Serial      Address
TAP02        3570     B11        13-10063    0270-1700FFFF

Error log ID ..... : 004602D2   Sequence ..... : 178324
Date ..... : 10/23/95   Time ..... : 11:38:02
Reference code ..... : 9350   Error code ..... : 00000000
Table ID ..... : 3750B11   IPL source ..... : B
Error type ..... : Permanent
Description ..... :
Tape unit failure

SIM/MIM message ..... : 00000000137E420077300000E4A08FA0
                        F980000B013000000000007503570B11

Press ENTER to continue.

F3=Exit          F6=Display hexadecimal report
F10=display previous detail report  F12=Cancel
  
```

AZ1MMS11

- |                                   |   |
|-----------------------------------|---|
| 1 Microcode and Link Level        | 5 Last FSC (fault symptom code)         |
| 2 Message Code                    | 6 Sequence Number (drive serial number) |
| See "Message Codes" on page MSG-9 | 7 Device Type                           |
| 3 FID (FRU Identifier)            | 8 Device Model Number                   |
| 4 First FSC (fault symptom code)  |   |

Figure 92. AS/400 Example Error Log of SIM

To display the hexadecimal error report, press F6. The following figure is an example of a 3570 hexadecimal error report which shows a permanent read/write error. Press **Page Up** or **Page Down** to display offset 0130 to 016C in the error log.

```

Display Hexadecimal Report for Resource

Name          Type      Model      Serial          Resource
TAP 2         357      B11       13-1  63         Name
                                           DEVICE

Offset        1 2 3 4 5 6 7 8 9 A B C D E F  EBCDIC
C
D
E      F88 78 65 1 1      27 17 FFFF 8.....
F      357 B11 935 1      6312 2 5D8D5E6 .....&.....QNW
1      F F F5F 4 4 425 92      5 .&.....
11     4      A B  E223444 3244 .....
12     F      3      4      9 .....
13     E42AA 8F 1 3 13 9 4249428 .....
14     1 1 35 42 133 6B 5 4A F9 .....
15     3      4      5A9      3 .....!.....
16     1      23      4438 362 2 2 .....
17     2 1      3      6 .....
                                           More...

Press Enter to continue.

F3=Exit      F12=Cancel

```

OFFSET	HEX	ASCII	DESCRIPTION
E4- E5	65 1		IOP Type
EC- ED	17		1 = IOP Port Used
			7 = Drive Address
F - F3	357 B11		Device Type and Model
F4- F5	935		SRC (system reference code)
13	E4		FID (FRU identification number)
132- 133	A 8F		First FSC (fault symptom code)
143- 144	3542		Second FSC (fault symptom code)
147- 148	336B		Next to Last FSC (fault symptom code)
14B- 14C	A F9		Last FSC (fault symptom code)
16A- 16C	443836	D86	Microcode level

Figure 93. AS/400 Hexadecimal Error Log (display)

Figure 94. Hex to ASCII Conversion

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	Null	30	0	41	A	4A	J	54	T
20	Space	31	1	42	B	4B	K	55	U
		32	2	43	C	4C	L	56	V
		33	3	44	D	4D	M	57	W
		34	4	45	E	4E	N	58	X
		35	5	46	F	4F	O	59	Y
		36	6	47	G	50	P	5A	Z
		37	7	48	H	51	Q	5F	-
		38	8	49	I	52	R		
		39	9			53	S		

**Note:** All codes are not shown.

The following figure is an example of an AS/400 hexadecimal error report printout with an Error Type of Permanent.

The FID and FSC in the error log are in hex, while the microcode level is in ASCII. Use the ASCII to Hex Conversion table provided.

Error Log Utility

Page . . . : 2  
 IBM 10/23/95 14:13:10

Partial Report for Resource

From . . . : 10/12/95 14:13:10 To . . . : 10/23/95 14:13:10

Resource	Type	Model	Serial Number	Address	Total Count
TAP02	3570	B11	13-10063	0270-1700FFFF	286

Reference Code	Error Type	Count
9350	Permanent	3
9355	Permanent	21
FFF6	Statistic	262

Detail Report for Resource

Resource	Type	Model	Number	Address
TAP02	3570	B11	13-10063	0270-1700FFFF

Error Log ID . . . . . : 004602D2      Sequence . . . . . : 178324  
 Date . . . . . : 10/23/95      Time . . . . . : 11:38:02  
 Reference code . . . : 9350      Error Code . . . . : 00000000  
 Table ID . . . . . : 35700B11      IPL Source . . . . : B  
 Error Type . . . . . : Permanent  
 Description . . . . . :

Tape unit detected a read or write error on tape medium

1	2	3
00000000 0000	C5D3F0F2	000000F8 007000E0 787BB495 F50000DC 0002B894 20F65F5F0 F1027000
00000000 0020	00000000	00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 0040	000000E3	C1D7F0F2 40404040 40F3F5F7 F0C2F1F1 00010063 93500046 02D20000
00000000 0060	00000000	00001700 FFFF1100 00000000 F3F5F9F0 F0C2F1F1 40D4C4C4 C3D40000
00000000 0080	0000F1F3	40404040 40404040 40404040 07000000 00000000 000000F8 0820E2C9
00000000 00A0	F1F84040	40404040 C4C3F7F3 40404040 4040E3C1 D7F2F540 40404040 00000000
00000000 00C0	00000000	00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00E0	F8807800	65010001 00000270 1700FFFF 35700B1A 93500001 00631202 05D8D5E6
00000000 0100	F0F0F5F0	40404250 00009200 00000000 00040000 0000A0B0 0E223444 32440000
00000000 0120	0000F000	03000000 00400000 00000900 E42AA08F 00010003 01300009 42494280
00000000 0140	10001035	42000133 6B0504A0 F9000000 00000003 00000400 00005A90 00000003
00000000 0160	00000100	00002300 00004438 36202020 20001000 00030000 00000000 00000600
00000000 0180	03003900	00000300 00001000 00000000 00013100 03000000 00400000 00000900
00000000 01A0	FE2A3800	00171202 05D80000 00171202 05D81000 00050000 00171202 05D80600
00000000 01C0	10002000	02000000 00171202 05D80600 00000000 00000000 40404040 40404040

- 1 Offset into the error log
- 2 Hexadecimal error log
- 3 EBCDIC field

OFFSET	HEX	ASCII	DESCRIPTION
184- 185	65 1		IOP Type
18C- 18D	12F		1 = IOP Port Used
			2F = Drive Address
19 - 193	357 B11		Device Type and Model
194- 195	935		SRC (system reference code)
1D	E4		FID (FRU identification number)
1D2- 1D3	A 8F		First FSC (fault symptom code)
143- 144	3542		Second FSC (fault symptom code)
147- 148	336B		Next to Last (fault symptom code)
1EB- 1EC	A F9		Last FSC (fault symptom code)
2 A- 2 C	443836	D86	Microcode level

Figure 95. AS/400 Hexadecimal Error Log (printout)

Once you have located the FID, go to START-1 for problem determination.

See *AS/400 Advanced Series Service Functions*, SY44-4902 for more detailed information on displaying and printing the error logs.

## AS/400 System with RISC Processor

1. Type STRSST (Start System Service Tools) command on the command entry line on the AS/400 Main Menu and press enter.
2. Select "Start a service tool".
3. Select "Product activity log".
4. Select "Analyze log".
5. Specify the time period for searching the error log, then select "Magnetic media" option.
6. On the "Select Analysis Report Options" menu, specify a device type of 3570 and press enter. Leave all other options at their default value.
7. Use the "Log Analysis Report" menu to display the desired error log entry.

**Note:** You may use the PF11 function key which will give you a brief description of the error log entry. This could be helpful when scanning the error logs.

8. The following figure is a sample AS/400 Error Log display screen showing the 3570 error log data.

Display Detail Report for Resource

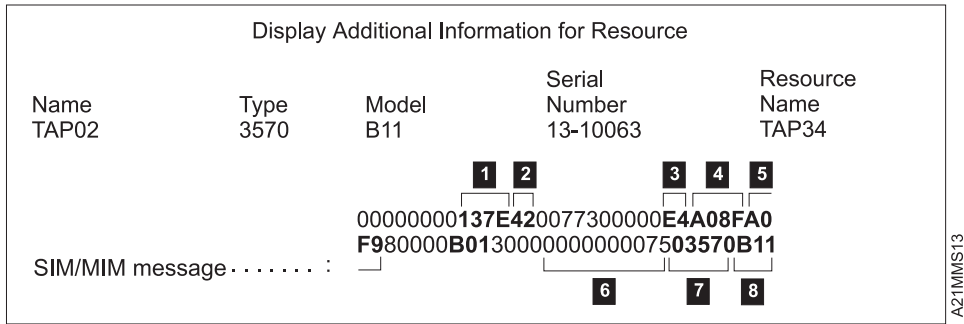
Name	Type	Model	Serial Number	Resource Name
TAP02	3570	B11	13-10063	TAP34
Error log ID	..... :	004602D2	Sequence	..... : 178324
Date	..... :	10/23/95	Time	..... : 11:38:02
Reference code	..... :	9350	Secondary code	..... : 00000000
Table ID	..... :	35700B11	IPL source/state	..... : B/3
Class	..... :	Permanent		
System Ref Code	..... :	35709300		
Tape unit failure				
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">1</span> <span style="border: 1px solid black; padding: 2px;">2</span> </div> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">3</span> <span style="border: 1px solid black; padding: 2px;">4</span> <span style="border: 1px solid black; padding: 2px;">5</span> </div> </div> 00000000137E420077300000E4A08FA0 F980000B013000000000007503570B11 <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">6</span> </div> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">7</span> <span style="border: 1px solid black; padding: 2px;">8</span> </div> </div>				
SIM/MIM message..... : <input type="checkbox"/>				
Press ENTER to continue.				
F3=Exit		F4=Additional Information		F6=Hexadecimal report
F9=Additional Information		F10=Previous detail report		F12=Cancel

A21MMS12

- |                                   |   |
|-----------------------------------|---|
| 1 Microcode and Link Level        | 5 Last FSC (Fault Symptom Code)         |
| 2 Message Code                    | 6 Sequence Number (drive serial number) |
| See "Message Codes" on page MSG-9 | 7 Device Type                           |
| 3 FID (FRU Identifier)            | 8 Device Model Number                   |
| 4 First FSC (fault symptom code)  |   |

Figure 96. AS/400 Example Error Log of SIM Message

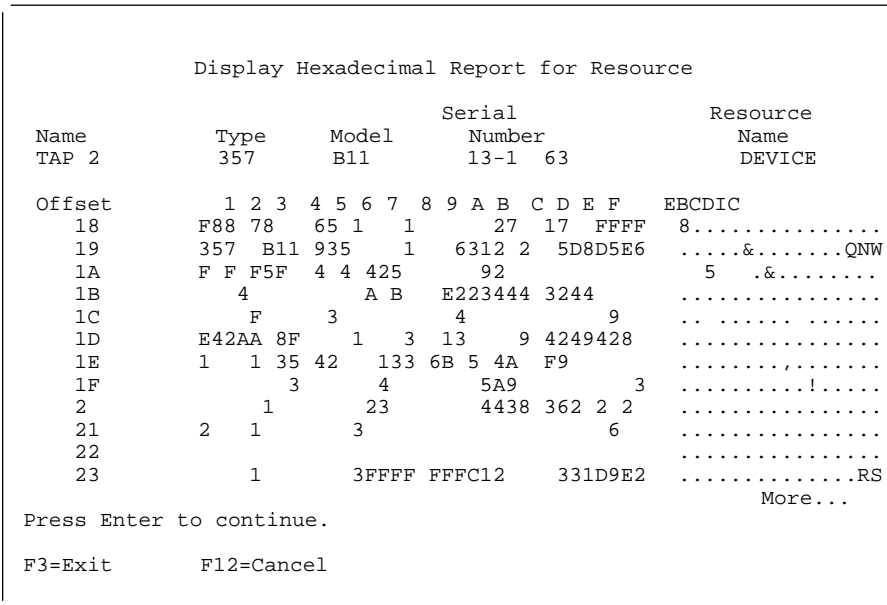
9. Press F4 to display additional information. See the example in Figure 97 on page MSG-27.



- |                                   |   |
|-----------------------------------|---|
| 1 Microcode and Link Level        | 5 Last FSC (Fault Symptom Code)         |
| 2 Message Code                    | 6 Sequence Number (drive serial number) |
| See "Message Codes" on page MSG-9 | 7 Device Type                           |
| 3 FID (FRU Identifier)            | 8 Device Model Number                   |
| 4 First FSC (fault symptom code)  |   |

Figure 97. AS/400 Example Error Log of SIM Message

To display the hexadecimal error report, press F6. The following figure is an example of a 3570 hexadecimal error report which shows a permanent read/write error. Press **Page Up** or **Page Down** to display offset 0130 to 016C in the error log.



OFFSET	HEX	ASCII	DESCRIPTION
184- 185	65 1		IOP Type
18C- 18D	17		1 = IOP Port Used
			7 = Drive Address
19 - 193	357 B11		Device Type and Model
194- 195	935		SRC (system reference code)
1D	E4		FID (FRU identification number)
1D2- 1D3	A 8F		First FSC (fault symptom code)
1E3- 1E4	3542		Second FSC (fault symptom code)
1E7- 1E8	336B		Next to Last FSC (fault symptom code)
1EA- 1EB	A F9		Last FSC (fault symptom code)
2 A- 2 C	443836	D86	Microcode level

Figure 98. AS/400 Hexadecimal Error Log (display)

The following figure is an example of an AS/400 hexadecimal error report printout with an Error Type of Permanent.

The FID and FSC in the error log are in hex, while the microcode level is in ASCII. Use the ASCII to HEX Conversion table provided.

Error Log Utility

Page . . . : 2  
 IBM 10/23/95 14:13:10  
 Partial Report for Resource

From . . . : 10/12/95 14:13:10 To . . . : 10/23/95 14:13:10

Resource	Type	Model	Serial Number	Address	Total Count
TAP02	3570	B11	13-10063	0270-1700FFFF	286

Reference Code	Error Type	Count
9350	Permanent	3
9355	Permanent	21
FFF6	Statistic	262

Detail Report for Resource

Resource	Type	Model	Number	Address
TAP02	3570	B11	13-10063	0270-1700FFFF

Error Log ID . . . . . : 004602D2 Sequence . . . . . : 178324  
 Date . . . . . : 10/23/95 Time . . . . . : 11:38:02  
 Reference code . . . : 9350 Error Code . . . . : 00000000  
 Table ID . . . . . : 35700B11 IPL Source . . . . : B  
 Error Type . . . . . : Permanent  
 Description . . . . . :

Tape unit detected a read or write error on tape medium

1	2	3
00000000 0000	C5D3F0F2 000000F8 007000E0 787BB495 F5000DC 0002B894 20100103 3C000000	*EL 02...8.....#.5.....*
00000000 0020	92100000 11000000 00000000 01720000 F3F5F9F0 C2F1F140 F1F260F0 F0F0F0F0	*.....3570B11 12-00000*
00000000 0040	4040F6F5 F0F10000 00000001 00010000 00020000 00050001 0002FFFF 0000FFFF	*...6501.....*
00000000 0060	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	*.....*
00000000 0080	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	*.....TA*
00000000 00A0	D7F0F740 40404040 00000000 00000000 00000000 00000000 00000000 00000000	*P07.....*
00000000 00C0	40404040 40404040 40404040 40404040 40404040 40404040 40404040 40404040	*.....*
00000000 00E0	F3F5F9F0 F0C2F1F1 0000E2D3 C9C3C9D6 4040E5F3 D9F6D4F0 40404040 00000000	*35700B11..SLICIO V3R6M0.....*
00000000 0100	00790000 00000000 00000170 00000000 00000000 01720000 00000000 00000000	*.....*
00000000 0120	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	*.....*
00000000 0140	E3C1D7F0 F7404040 40400000 00000000 40404040 40404040 40404040 00070001	*TAP07.....*
00000000 0160	00000000 10200003 00000000 00000000 00000000 00000000 0005001E 00000188	*.....*
00000000 0180	F8807800 65010001 00000120 12F0FFFF 35700B11 92100000 00001202 06240000	*8.....0.....*
00000000 01A0	00000000 00004250 0000920E 00000000 00040000 0000A0B0 0E213234 433800B4	*.....&.....*
00000000 01C0	0000F000 03000000 00400000 00000900 E42AA08F 00010003 01300009 4294280	*...0.....*
00000000 01E0	10001035 42000133 6B0504A0 F9000000 00000003 00000400 00005A90 00000003	*.....1.....*
00000000 0200	00000100 00002300 00004438 36202020 20001000 00030000 00000000 00000600	*.....*
00000000 0220	03003900 00000300 00001000 00000000 00013100 03000000 00400000 00000900	*.....*
00000000 0240	FE2A3800 00171202 05D80000 00171202 05D81000 00050000 00171202 05D80600	*.....Q.....Q.....Q.....*
00000000 0260	10002000 02000000 00171202 05D80600 00000000 00000000 40404040 40404040	*.....Q.....*
00000000 0280	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	*.....*
	1 LINES 00000000 02A0 TO 00000000 02A0 SAME AS ABOVE	
00000000 02C0	00000000 00000000 00000000 00000000 00000000 00000000 00000000 000000D5	*.....N.....*
00000000 02E0	00000000 00000000 00000000 00000000 00000000 00000000 00000000 0000D500	*.....N.....*
00000000 0300	00000000 40404040 40404040 40404040 40404040 40404040 40404040 40404040	*.....*

\*\*\*\*\* END OF COMPUTER PRINTOUT \*\*\*\*\*

- 1 Offset into the error log
- 2 Hexadecimal error log
- 3 EBCDIC field

OFFSET	HEX	ASCII	DESCRIPTION
184- 185	65 1		IOP Type
18C- 18D	12F		1 = IOP Port Used
			2F = Drive Address
19 - 193	357 B11		Device Type and Model
194- 195	935		SRC (system reference code)
1D	E4		FID (FRU identification number)
1D2- 1D3	A 8F		First FSC (fault symptom code)
1E3- 1E4	3542		Second FSC (fault symptom code)
1E7- 1E8	336B		Next to Last FSC (fault symptom code)
1EB- 1EC	A F9		Last FSC (fault symptom code)
2 A- 2 C	443836 D86		Microcode level

Figure 99. AS/400 Hexadecimal Error Log (printout)



AZ11MMS15

Check the Message Code, see "Message Codes" on page MSG-9, for all SIMs before entering the START section with the FID. Once you have located the FID, go to START-1 for problem determination.

See *AS/400 Advanced Series Service Functions*, SY44-4902 for more detailed information on displaying and printing the error logs.

*Figure 100. Hex to ASCII Conversion*

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	Null	30	0	41	A	4A	J	54	T
20	Space	31	1	42	B	4B	K	55	U
		32	2	43	C	4C	L	56	V
		33	3	44	D	4D	M	57	W
		34	4	45	E	4E	N	58	X
		35	5	46	F	4F	O	59	Y
		36	6	47	G	50	P	5A	Z
		37	7	48	H	51	Q	5F	-
		38	8	49	I	52	R		
		39	9			53	S		

**Note:** All codes are not shown.

```

enter selection: 39
Scsi status: 2h/Sense information Length 6 h
Sense KEY/ASC/ASCQ = 2/3a/
KEY meaning is: not ready
Sense Info - - - consult SCSI spec for details

      1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
-----
- 7      2          58      3a  FF  2
1 - C4  8          1 4          A
2 -
3 -
4 -          32 46 31 2  2  2  2
5 -

analyze <> called with rc 1 err <ERROR_SUCCESS> data
total elapsed time in seconds = .
Return to continue:

```

HEX	ASCII	DESCRIPTION
FF		FID (FRU identification number) Byte 14
C4 8		FSC (fault symptom code) Bytes 16 and 17
324631	2F1	Microcode level, Bytes 72-74
(Not shown)		VOLSER# in ASCII or EBCDIC, Bytes 83-88

*Figure 101. Tape Util Error Sample*

For further information on gathering error data, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation an User's Guide*. GC35-0154, the MSG section of the Manual of Instructions and the Hardware Reference Manual. On certain errors a ntutil test\_unit\_ready command (39) has to be issued to display the sense information. Sense information can also be retrieved with a log\_sense command (83).



## NTUTIL Symbolic Error and Error Number

Symbolic Error	NT Error Number
ERROR_SUCCESS	
ERROR_INVALID_FUNCTION	1
ERROR_FILE_NOT_FOUND	2
ERROR_PATH_NOT_FOUND	3
ERROR_TOO_MANY_OPEN_FILES	4
ERROR_ACCESS_DENIED	5
ERROR_INVALID_HANDLE	6
ERROR_NOT_ENOUGH_MEMORY	8
ERROR_BAD_FORMAT	9
ERROR_INVALID_BLOCK	1
ERROR_BAD_ENVIRONMENT	11
ERROR_INVALID_ACCESS	12
ERROR_INVALID_DATA	13
ERROR_OUTOFMEMORY	14
ERROR_INVALID_DRIVE	15
ERROR_WRITE_PROTECT	19
ERROR_BAD_UNIT	2
ERROR_NOT_READY	21
ERROR_BAD_COMMAND	22
ERROR_CRC	23
ERROR_HANDLE_EOF	38
ERROR_NOT_SUPPORTED	5
ERROR_DEV_NOT_EXIST	55
ERROR_ALREADY_ASSIGNED	85
ERROR_INVALID_PARAMETER	87
ERROR_OPEN_FAILED	11
ERROR_INSUFFICIENT_BUFFER	122
ERROR_INVALID_NAME	123
ERROR_BUSY_DRIVE	142
DD_NO_SENSE	2
DD_DEVICE_DRIVER_FAILURE	2 1
DD_EEPROM_FAILURE	2 2
DD_MANUAL_INTERVENTION	2 3
DD_RECOVERED_ERROR	2 4
DD_SCSI_ADAPTER_ERROR	2 5
DD_SCSI_ERROR	2 6
DD_SCSI_BUSY	211
DD_ILLEGAL_REQUEST	2 7
DD_COMMAND_ABORTED	2 8
DD_HARDWARE_MICROCODE	2 9
DD_UNIT_ATTENTION	21
ERROR_MORE_DATA	234
DD_CARTRIDGE_ENTRY_FAILURE	3

MSG

Symbolic Error	NT Error Number
DD_CARTRIDGE_LOAD_FAILURE	3 1
DD_CARTRIDGE_IN_FAILED_DRIVE	3 2
DD_CAROUSEL_NOT_LOADED	3 3
DD_CHANGER_FAILURE	3 4
DD_DRIVE_FAILURE	3 5
DD_DRIVE_OR_MEDIA_FAILURE	3 6
DD_ENTRY_EXIT_FAILURE	3 7
DD_ENTRY_EXIT_NOT_PRESENT	3 8
DD_LIBRARY_AUDIT	3 9
DD_LIBRARY_FULL	31
DD_MEDIA_EXPORT	311
DD_SLOT_FAILURE	312
DD_SLOT_OR_MEDIA_FAILURE	313
DD_SOURCE_EMPTY	314
DD_DESTINATION_FULL	315
DD_CLENER_INST	316
DD_MEDIA_NOT_EJECTED	317
DD_IOPORT_NOT_CONFIG	318
DD_FIRST_DEST_EMPTY	319
DD_END_PHYSICAL_MEDIA	4
DD_MEDIA_BLANK	4 1
DD_MEDIA_CORRUPTED	4 2
DD_MEDIA_FAILURE	4 3
DD_MEDIA_INCOMPATIBILITY	4 4
DD_SECTOR_RELOCATION	4 5
DD_SECTOR_OUT_OF_RANGE	4 6
DD_WRITE_PROTECT	4 7
DD_CLEAN_MEDIA	4 8
DD_MEDIA_FAULT	4 9
DD_CLEANING_COMPLETE	41
DD_LOGICAL_END_OF_MEDIA	411
DD_MEDIA_NOT_PRESENT	412
DD_BEGINNING_OF_MEDIA	413
DD_ERASE_FAILURE	414
DD_WRITE_TO_WRITTEN_WORM	415
DD_WRONG_LENGTH_BLOCK	416
ERROR_IO_INCOMPLETE	996
ERROR_IO_PENDING	997
ERROR_NOACCESS	998
ERROR_CANTOPEN	1 11
ERROR_CANTREAD	1 12
ERROR_CANTWRITE	1 13
ERROR_END_OF_MEDIA	11

Symbolic Error	NT Error Number
ERROR_FILEMARK_DETECTED	11 1
ERROR_BEGINNING_OF_MEDIA	11 2
ERROR_SETMARK_DETECTED	11 3
ERROR_NO_DATA_DETECTED	11 4
ERROR_PARTITION_FAILURE	11 5
ERROR_INVALID_BLOCK_LENGTH	11 6
ERROR_DEVICE_NOT_PARTITIONED	11 7
ERROR_UNABLE_TO_LOCK_MEDIA	11 8
ERROR_UNABLE_TO_UNLOAD_MEDIA	11 9
ERROR_MEDIA_CHANGED	111
ERROR_BUS_RESET	1111
ERROR_NO_MEDIA_IN_DRIVE	1112
ERROR_IO_DEVICE	1117
ERROR_TOO_MANY_LINKS	1142

MSG



---

# Operator Panel

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CE FID FF Log Menu . . . . .	PANEL-46
CE Utilities Menu . . . . .	PANEL-47
OEM Use Only Menu . . . . .	PANEL-48
CE Disp Sensors Menu . . . . .	PANEL-49
CE Disp/Alt VPD Menu . . . . .	PANEL-50
CE Group Name Menu . . . . .	PANEL-51
CE VPD Field Offset Menu . . . . .	PANEL-51
CE VPD Data Menu . . . . .	PANEL-52
CE Verify Data Menu . . . . .	PANEL-52
CE Control Store Select Address Menu . . . . .	PANEL-53
CE Control Store Display Menu . . . . .	PANEL-54
CE Microcode Trap Menu . . . . .	PANEL-55
CE Read Tape Menu . . . . .	PANEL-56
CE Process Tape Menu . . . . .	PANEL-57
Space Menu . . . . .	PANEL-58
Read Block Menu . . . . .	PANEL-59
Next Block ID Menu . . . . .	PANEL-59
Password Menu . . . . .	PANEL-60
Engr Use Only Menu . . . . .	PANEL-61
Media Mode Menu . . . . .	PANEL-62
Statistics Menu . . . . .	PANEL-63
Control Store Select Address Menu . . . . .	PANEL-65
Control Store Alter Menu . . . . .	PANEL-65
CE Saved Traps Menu . . . . .	PANEL-66
CE Saved FSC Trap List Menu . . . . .	PANEL-67
CE Remove Saved FSC Trap Menu . . . . .	PANEL-68
CE FSC Trap List Menu . . . . .	PANEL-68
CE Remove FSC Trap Menu . . . . .	PANEL-69

## Operator Panel Overview

Figure 102 shows the operator panel for the library models and illustrates the Liquid Crystal Display screen 1 :

Four types of screens are displayed on the operator panel:

- “Status Screen” on page PANEL-5
- “Intervention Screens” on page PANEL-9
- “Supplemental Message Screens” on page PANEL-11
- “Menu Screens” on page PANEL-11

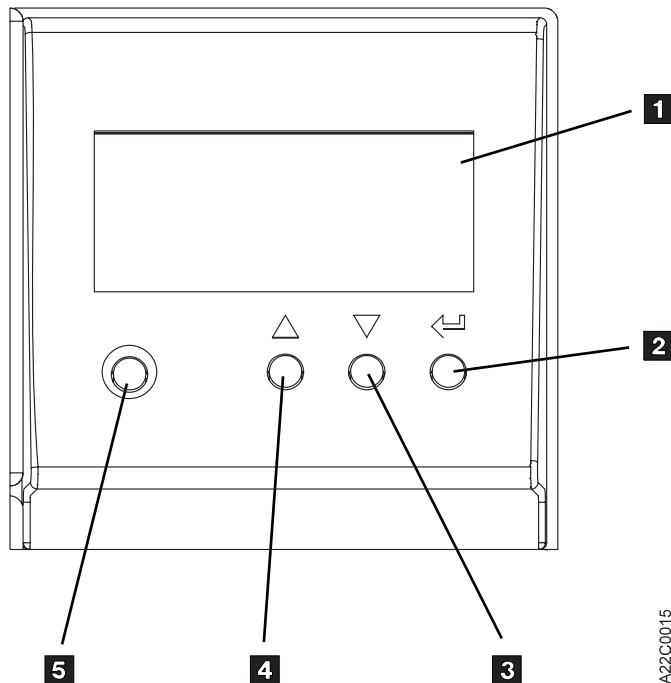


Figure 102. Operator Panel for Library Models

**Note:** The operator panel for the Models B21 and B22 has a straight front cover while the operator panel for the Models B01, B02, B11 and B12 has a sloping shape to its front cover. The straight design was required to fit into the Netfinity rack system.

The operator panel has the following four control buttons:

2 **Enter button**

Pressing this button causes the device to select the option or perform the function indicated by the selection arrow (>).

**Note:** Hardware Reset is accomplished by pressing the Menu Mode, Scroll Up, and Enter buttons all at the same time.

3 **Scroll Down button**

Pressing the Scroll Down button moves the selection arrow (>) down to the next option, if any, on the menu. If none, the button action is ignored. The plus (+) symbol in the lower right corner of the display indicates that the list of additional menu items continues below the last item visible on the display. To view these selections, press the Scroll Down button.

#### 4 **Scroll Up button**

Pressing the Scroll Up button moves the selection arrow (>) up to the next option, if any, on the menu. If none, the button action is ignored. The plus (+) symbol in the upper right corner of the display indicates that the list of additional menu items continues above the first item visible on the display. To view these selections, press the Scroll Up button.

**Note:** Hardware Reset is accomplished by pressing the Menu Mode, Scroll Up, and Enter buttons all at the same time.

#### 5 **Menu Mode button**

The Menu Mode button allows selection of operator or service mode at any time.

At power on, the device will be in Operator mode.

The Menu Mode button is recessed slightly in the panel to prevent inadvertent mode changes by the operator and should not be used during normal operations. If you press the Menu Mode button and receive the message "Warning - Service Personnel Only," press the Enter button and then select Cancel to return to normal operating mode. During the time the library unit is in service mode, the subsystem is offline to the host and unavailable for read and write operations.

**Note:** Hardware Reset is accomplished by pressing the Menu Mode, Scroll Up, and Enter buttons all at the same time.



## Status Screen

The explanation of the status and intervention screens that follows describes the messages displayed on the operator panel by the library. It is possible for system application software to display other information or messages on the operator panel. Refer to the system application software documentation for explanations of any messages not described below.

The status screen ( Figure 103) provides a view of the current operational status of the library and drive. This screen is the normal default screen. If some other screen is the current display and you want to check status, select SHOW STATUS from the **Options Menu**.

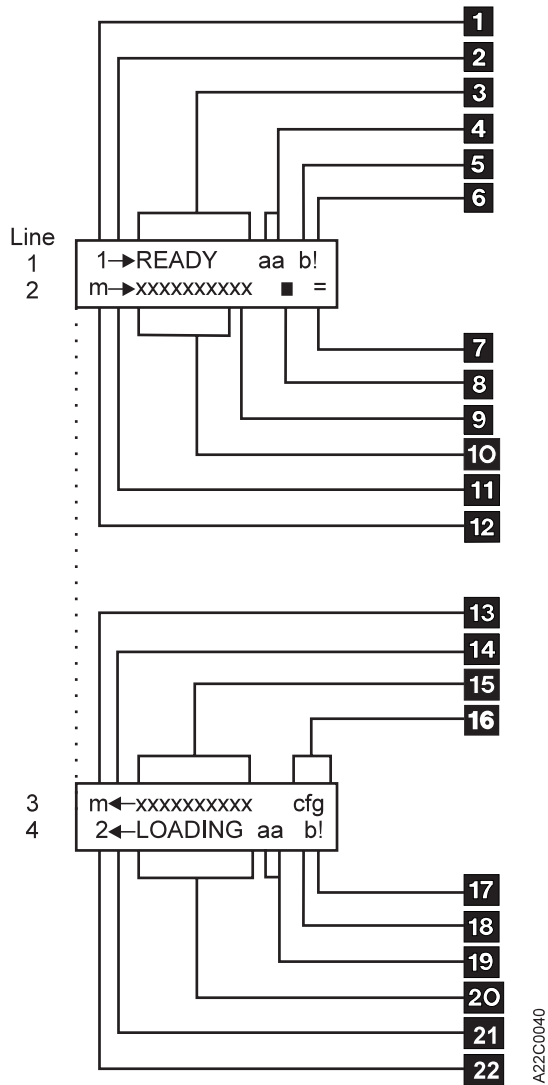


Figure 103. Status Screen

- |    |   |  |     |    |                                |
|----|---|--|-----|----|--------------------------------|
| 1. | 1 | Drive in use   | 7.  | 7  | Library status                 |
| 2. | 2 | Drive location   | 8.  | 8  | Cleaning cartridge status      |
| 3. | 3 | Drive status   | 9.  | 9  | Priority cell                  |
| 4. | 4 | Percentage (%) of tape processed                         | 10. | 1  | Magazine 1 cells (10-1) status |
| 5. | 5 | File protect status                                      | 11. | 11 | Magazine 1 location            |
| 6. | 6 | Dump available symbol (!) or drive requires cleaning (*) | 12. | 12 | Library Mode                   |
|    |   |  | 13. | 13 | Library Mode                   |

14.	14	Magazine 2 location	18.	18	File protect status
15.	15	Magazine 2 cells (20-11) status	19.	19	Percentage (%) of tape processed
16.	16	Library Configuration	20.	2	Drive status
17.	17	Dump available symbol (!) or drive requires cleaning (*)	21.	21	Drive position
			22.	22	Drive in use


## Line 1


Line 1 displays the status of drive 1.

- 1 the numeral "1" indicates that the remainder of this line of text refers to drive 1.
- 2 indicates the physical location of drive 1  
→ indicates drive 1 is located on the right.
- 3 a word such as READY is displayed to indicate a brief status of drive 1. The following is a list of the words that are displayed in this field:

<b>CLEANING</b>	A head cleaning operation is in process.
<b>READY</b>	The device is loaded, not moving media, and not performing a rewind-unload operation.
<b>LOADING</b>	The cartridge is being loaded into the drive.
<b>LOCATING</b>	The device is moving the media to a specific location.
<b>READING</b>	The device is reading data from the media to the device buffer.
<b>WRITING</b>	The device is writing data from the device buffer to the media.
<b>ERASING</b>	The device is erasing data from the media.
<b>REWINDNG</b>	The device is rewinding the media to the beginning of the logical volume.
<b>UNLOADNG</b>	The cartridge is being removed from the drive.
<b>[blank field]</b>	The library is inactive and the drive is not loaded.
<b>LOAD PT</b>	The volume in the device is positioned at load point.
<b>ACCESSNG</b>	The picker is moving to get a cartridge.
<b>XFERRING</b>	The picker is moving a cartridge to another slot or to the drive.
<b>DIAG RUN</b>	The diagnostic tests are running.
<b>UCODE LD</b>	Microcode is loading.
<b>INIT</b>	The drive is in the process of resetting.
<b>CODE LVL</b>	A microcode mismatch exists between drive 1 and 2.
<b>RECOVER</b>	The drive requires recovery. See "Clearing Tape Drive Recover Status" on page PROC-35.
<b>REPLACE CLN CART</b>	The cleaning cartridge needs to be replaced.

- 4 indicates the percentage of media that has been *used* (processed) by drive 1.
- 5 is a lock symbol that indicates the status of the file-protect switch on the cartridge currently loaded in drive 1.

The file-protected icon  is a *read only* symbol that indicates that the file-protect switch is in the write-prevent position.


The file-unprotected icon  is a *read/write* symbol that indicates that the file protect switch is in the allow-write position.

6 when the exclamation point (!) is displayed, a dump is available for drive 1. A dump contains detailed information that pertains to the device operation at the time of a failure. When the asterisk (\*) is displayed, drive 1 needs to be cleaned.


## Line 2


Line 2 displays the status of magazine 1, the cleaning cartridge cell, and the library.

7 indicates the library status; that is, if the library is moving, a gripper (=) is shown. If a cartridge is being moved, a horizontal line appears between the *fingers* of the gripper (±).

8 indicates the status of the cleaning cartridge storage slot located inside the Magstar MP subsystem. A solid pattern  indicates that the cleaning cartridge is in the storage slot. A dash (-) indicates that no cleaning cartridge is present in the storage slot.

9 indicates the state of the priority cell where the operator can load a cartridge.

A solid pattern  indicates that a cartridge is present and that it is in the *import* position; that is, accessible to the library.

An open pattern  indicates that a cartridge is present and that it is in the *export* position; that is, not accessible to the library.

A one (1) indicates that the cell is in use by drive 1.

A two (2) indicates that the cell is in use by drive 2.

A dash (-) indicates that no cartridge is present in that position of the magazine.

An hour-glass shape (an X filled in at the top and bottom) indicates the Magstar MP has not determined the status of a magazine cell.

1 indicates the state of the ten storage elements associated with magazine 1, (including the priority cell). The cells are numbered from 10 to 1, left to right. See item 9 above for a list of symbols that can appear in this field.

11 indicates the physical location of magazine 1

→ indicates magazine 1 is located on the right.

12 displays the library mode (A=AUTO, R=RANDOM, M=MANUAL) for all drives in a Base Configuration or associated with drive 1 in a Split Configuration. During a power-on reset before the microcode can determine the mode set in nonvolatile storage, N is displayed.

## Line 3

Line 3 displays the status of magazine 2 and the library configuration.

13 displays the library mode (A=AUTO, R=RANDOM, M=MANUAL) associated with drive 2 in a Split Configuration. During a power-on reset before the microcode can determine the mode set in nonvolatile storage, N is displayed.

14 indicates the physical location of magazine 2.

← indicates magazine 2 is located on the left.

15 indicates the state of the ten storage elements associated with magazine 2. The cells are numbered from 20 to 11, left to right. See 9 in the Line 2 description for a list of the symbols that are displayed in this field.

16 indicates the library configuration.

BAS indicates the base library configuration.

SPL indicates the split library configuration.

## Line 4

Line 4 displays the status of drive 2.

17 when the exclamation point (!) is displayed, a dump is available for drive 2. A dump contains detailed information that pertains to the device operation at the time of a failure. When the asterisk (\*) is displayed, drive 2 needs to be cleaned.

18 is a lock symbol that indicates the status of the file-protect switch on the cartridge currently loaded in drive 2. See 5 in the Line 1 description for a list of the symbols that are displayed in this field.

19 indicates the percentage of media that has been *used* (processed) by drive 2.

2 indicates the status of drive 2. See 3 in the Line 1 description for a list of the words that are displayed in this field.

21 indicates the physical location of drive 2.

← indicates drive 2 is located on the left.

22 the numeral "2" indicates that the remainder of this line of text refers to drive 2.

## Intervention Screens

Intervention messages are presented on the operator panel in the intervention screen. The intervention screen consists of a message displayed in a screen with a black border. The drive number which generated the message is listed on the top line.

Device activity or status messages are informational, not intervention notices. These messages are displayed on the Status screen. These messages include *reading*, *writing*, and *locating*.

The intervention message types are FID1 messages, FID2 messages, FID3 messages, FID4 messages, attention messages, and routine messages.

**Note:** When the FID message appears, write down the FID number and the drive number should they be needed by the service representative to describe the error condition. As you try to fix the error condition, the FID message that originally appeared will be replaced on the display screen with supplemental messages. You will not be able to restore this FID message to the screen unless you recreate the error condition.

### FID1 Messages

The FID1 message is displayed when a hardware failure occurs within the device. Call for service.

Figure 104 shows an example of the FID1 92 message posted by drive 2.



Figure 104. Error Message Example

### FID2, FID3, and FID4 Messages

The FID2, FID3, and FID4 messages indicate that the library requires service but can still be used. Schedule a service call.

### Support Data

If a FID message is displayed when a hardware failure occurs, a supplemental message screen with additional support data can be displayed by pressing the Enter button. The support data will be 1 or more lines of 12 characters in the form:

XXXX YYYY ZZZZ

where XXXX is the first FSC (Fault Symptom Code), YYYY is the second FSC, and ZZZZ is the microcode level.

### ATTENTION Messages

The ATTENTION messages indicate error conditions that you may be able to resolve.

After an Attention message is received, note the drive number and press the Enter key to observe any supplemental messages with additional information.

The ATTENTION messages can be either ATTENTION DRIVE or ATTENTION LIBRARY messages (see Figure 105).



Figure 105. Attention Message Example

### Routine Messages

Routine Messages consist of messages received from the host through the SCSI Display Message command. These messages include **MOUNT** (Mvolser prompts the operator to mount volser in the priority cell), **DEMOUNT** (Dvolser prompts the operator to remove volser from the priority cell), and messages from the device (for example, **\*CLEAN**, which prompts the operator to clean the tape drive when automatic cleaning is turned off). Another example of a routine message is **NO CARTRIDGE**. This message is displayed when the library is set to Automatic Mode and there are no cartridges remaining in the magazine(s) to be loaded in the drive.

The routine messages that are received through the Display Message command consist of mount messages, demount messages, and general (custom) messages.

## Resolving ATTENTION Messages

Many ATTENTION messages are caused by conditions that the operator should be able to resolve without the necessity of a service call. In these cases, pressing the Enter button will cause a supplemental message to appear that will further clarify the nature of the problem. Depending upon the supplemental message, the operator should take recommended actions to fix the problem on the spot.

If the supplemental message indicates **DRIVE DISABLED UNTIL CLEANED**, the tape drive must be cleaned before further use of the drive is allowed. This supplemental message is only displayed if the **CLEAN** message is repeatedly ignored. For instructions on cleaning the tape drive, see "Drive Head Cleaning Procedure" on page PROC-28 and "Inserting or Removing a Cleaning Cartridge" on page PROC-28. The Magstar MP can be configured for automatic cleaning. Refer to "Inserting or Removing a Cleaning Cartridge" on page PROC-28 and "Setting Automatic Cleaning" on page PROC-28.

If the supplemental message indicates **REPLACE CLN CART**, the cleaning cartridge needs to be replaced. Ask your customer to re-order cleaning cartridges by using the procedure in *IBM Magstar MP 3570 Tape Subsystem Operator Guide, B Series Models*. You can replace the cleaning cartridge by following the procedure at "Inserting or Removing a Cleaning Cartridge" on page PROC-28. Continue to use the old cleaning cartridge until your customer receives the new one.

In the event that no effective operator resolution of an ATTENTION message is possible, call for service.

Do the following simple steps first whenever normal operation is disrupted:

- Ensure that all cartridges are properly positioned in magazine cells or the drive.

- Try to unload the cartridge. If a cartridge is stuck in the drive, see "Removing Tape Cartridge from Drive" on page PROC-23.

- Check the integrity of the cartridge to see that it is properly functioning and is not broken or otherwise obstructed by contaminants or improperly applied user labels.

- Check the display panel to see if a closed lock symbol is present. If it is, the cartridge is write protected and will not allow a write operation to take place.

Check to see if the write-protect tab is set in the upward position to protect the tape from being written on. If you are attempting to write on the tape with the write-protect tab upward, you will experience an error condition.

Check to ensure that the cartridge is the proper type (Magstar MP Fast Access Linear Tape).

Ensure that a cleaner cartridge has been inserted if one has been requested and, conversely, that no cleaner cartridge has been inserted if a data cartridge is required.

Check to see if the display indicates FID1 95. If it does, you may have forgotten to remove the shipping bracket. Remove the bracket and continue the procedure. See steps at "Installation Checkout—Library Models" on page INST-43.

Ensure that the library is in operator mode (see 5 in Figure 102 on page PANEL-3).

Ensure that the library is online.

Turn the power off and then on again.

**Note:** Two power cords are required for Models B02 and B12. Make sure both power cords are plugged into the library unit and into the power outlet.

---

## Supplemental Message Screens

Supplemental screens provide additional information to the operator to clarify an error condition or to advise the operator to follow a particular course of action to resolve specific error conditions.

Generally, it is necessary to press the Enter button after an error message appears to see the accompanying supplemental screen.

---

## Menu Screens

When a menu screen is present, use the Scroll Down button (see 3 in Figure 102 on page PANEL-3) or the Scroll Up button (see 4 in Figure 102 on page PANEL-3) to move the arrow (>) to the desired selection, and then press the Enter button (see 2 in Figure 102 on page PANEL-3). This operation will select the desired option from the menu.

**Note:** An option marked with an **asterisk** indicates the option is not available for selection or the option is the selection currently in use by the library. For example: if the drive is not loaded with a tape cartridge, the UNLOAD DRIVE option will be marked with an **asterisk** indicating it is not available for selection.

## Operator Menus

Figure 106 on page PANEL-12 shows the operator menu functions. (The bold text in the figure shows the names of the menus.)

These menus are available after the successful completion of the power-on self-test.

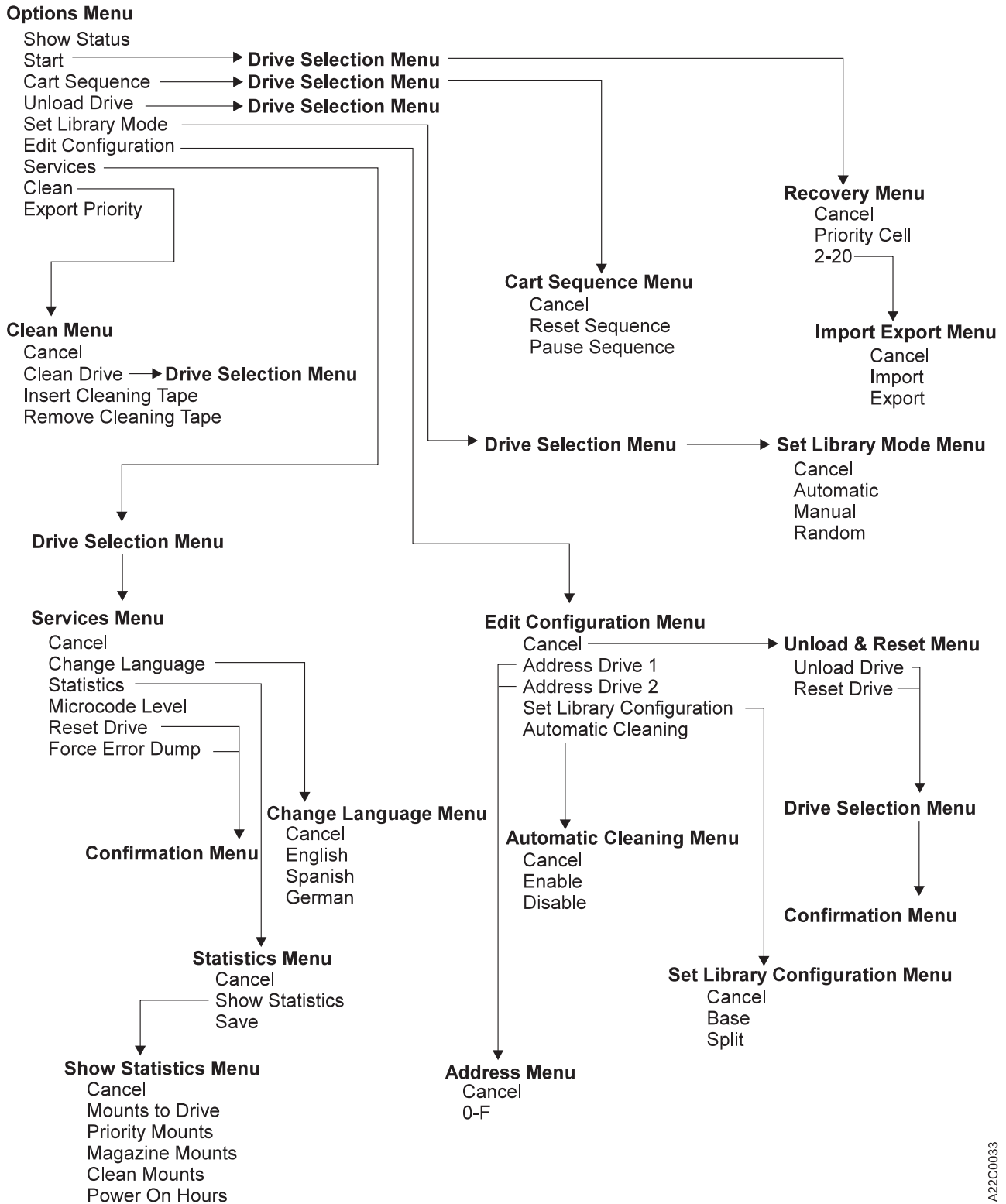


Figure 106. Operator Menus

A22C0033



## Options Menu

<i>Figure 107. Options Menu</i>	
Function	Next Menu
SHOW STATUS	"Status Screen" on page PANEL-5
START	Figure 108
CART SEQUENCE	After Figure 108 to Figure 109 on page PANEL-14.
UNLOAD DRIVE	Figure 108
SET LIBRARY MODE...	After Figure 108 to Figure 110 on page PANEL-15
EDIT CONFIGURATION...	Figure 111 on page PANEL-15
SERVICES...	After Figure 108 to Figure 116 on page PANEL-18
CLEAN...	"Clean Menu" on page PANEL-21
EXPORT PRIORITY	—

**Show Status** Displays the Status screen (see Figure 103 on page PANEL-5).

**Start** Loads cartridge into the drive in automatic or manual mode, or starts the library error recovery. (See "Clearing Tape Drive Recover Status" on page PROC-35).

**Cart Sequence** Allows the operator to pause or to reset the sequence of cartridges processed by the drive.

**Unload Drive** After selecting the drive to be unloaded, it causes the drive to rewind and unload the cartridge in the drive. If the library is in random mode, the cartridge destination is selectable by the operator. (See "Clearing Tape Drive Recover Status" on page PROC-35).

**Set Library Mode** Sets the Library mode to automatic, manual, or random.

**Edit Configuration** Allows the operator to perform configuration tasks.

**Services** Allows the operator to perform miscellaneous tasks, such as setting the language used on the panel.

**Clean** Allows cleaning of the drive tape path and cleaner cartridge handling.

**Export Priority** Moves a cartridge in the priority slot into the export position

## Drive Selection Menu

This menu is applicable to models B02 or B12 only.

<i>Figure 108. Drive Selection Menu</i>	
Function	Next Menu
CANCEL	Previous menu
DRIVE 1	—
DRIVE 2	—

**Cancel** Displays the previous menu that was active.

**Drive 1** Selects Drive 1 as the drive to be used when displaying the next menu, or when performing the selected option.

**Drive 2** Selects Drive 2 as the drive to be used when displaying the next menu, or when performing the selected option.

## Cart Sequence Menu

<i>Figure 109. Cart Sequence Menu</i>	
Function	Next Menu
CANCEL	Previous menu
RESET SEQUENCE	Figure 107 on page PANEL-13
PAUSE SEQUENCE	Figure 107 on page PANEL-13

**Cancel** Displays the previous menu that was active.

**Reset Sequence** This option resets the order in which cartridges are processed by the drive.

If the drive is set to Automatic Mode or Manual Mode and the Reset Sequence option is selected, the drive will stop processing cartridges when the tape currently loaded in the drive has been unloaded. In order to resume operation, the operator must select START on the options Menu. Instead of resuming operation where it left off, the library loads the first cartridge it finds in the import position beginning at the rightmost cell position.

The Reset Sequence option is not available if the drive is set to Random Mode of Operation.

**Pause Sequence** This option causes the drive to stop loading cartridges.

If the drive is set to Automatic Mode and the Pause Sequence option is selected, the drive will stop processing cartridges when the tape currently loaded in the drive has been unloaded. In order to resume the operation, the operator must select START on the Options Menu. The drive will then load the next available cartridge.

The Pause Sequence option is not available if the drive is set to Manual or Random Mode of operation.

## Set Library Mode Menu

<i>Figure 110. Set Library Mode Menu</i>	
Function	Next Menu
CANCEL	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
AUTOMATIC	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
MANUAL	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
RANDOM	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
<b>Note:</b> Model B02, B12 or B22 causes the Figure 108 on page PANEL-13 to appear. Model B01, B11 or B21 causes the Figure 107 on page PANEL-13 to appear.	

**Cancel** Causes the Figure 108 on page PANEL-13 to appear.

**Automatic, Manual, or Random** See “Library Modes of Operation” on page LIBRARY-5.

## Edit Configuration Menu

<i>Figure 111. Edit Configuration Menu</i>	
Function	Next Menu
CANCEL	“Unload & Reset Menu” on page PANEL-17 or Figure 107 on page PANEL-13
ADDRESS DRIVE 1	Figure 112 on page PANEL-16
ADDRESS DRIVE 2	Figure 112 on page PANEL-16
SET LIBRARY CONFIGURATION	“Set Library Configuration Menu” on page PANEL-16
AUTO CLEAN	“Clean Menu” on page PANEL-21

**Cancel** Causes the “Unload & Reset Menu” on page PANEL-17 to appear if any changes were made to the configuration; otherwise the Figure 107 on page PANEL-13 will appear.

**Address Drive 1** Allows the operator to select the SCSI address to be used for the device-to-host interface for tape drive 1. The address consists of one hexadecimal digit that specifies the SCSI ID for that interface.

**Address Drive 2** Allows the operator to select the SCSI address to be used for the device-to-host interface for tape drive 2. The address consists of one hexadecimal digit that specifies the SCSI ID for that interface.

**Set Library Configuration** Allows the operator to configure the library to operate in base or split configuration.

**Automatic Cleaning** Allows the operator to choose whether or not the library unit will automatically clean the tape drive(s) when they require cleaning.

## Address (SCSI ID) Drive 1 or Drive 2 Menu

<i>Figure 112. Set Address (SCSI ID) Menu</i>	
Function	Next Menu
CANCEL	Figure 111 on page PANEL-15
0–F (hexadecimal)	Figure 111 on page PANEL-15

**Note:** The address must be defined also at the host.

**Cancel** Causes the Figure 111 on page PANEL-15 to appear.

**<value>** Allows the operator to set the SCSI ID of the library. The value can be from 0–F (16 addresses in hexadecimal).

**Notes:**

1. You must select Reset Drive from the **Unload and Reset Menu** or switch off power to the device and then switch on power to activate the new address.
2. For dual drive models attached to a single host initiator, each drive must have a unique address. They can not be the same. When these models are attached to two host initiators (one host to each drive), the drive addresses may be the same or they may be unique.
3. The physical drive address switch is ignored for library models. The address is only selected at the operator panel and retained in nonvolatile memory.

## Set Library Configuration Menu

<i>Figure 113. Set Configuration Menu</i>	
Function	Next Menu
CANCEL	Figure 111 on page PANEL-15
BASE	Figure 111 on page PANEL-15
SPLIT	Figure 111 on page PANEL-15

**Cancel** Causes the Figure 111 on page PANEL-15 to appear.

**Base** Allows the Magstar MP to be configured to operate in base configuration. The display shows **BASE**.

**Split** Allows the Magstar MP to be configured to operate in split configuration. The display shows **SPLIT**.

See “Library Configurations” on page LIBRARY-7

## Automatic Cleaning Menu

<i>Figure 114. Auto Clean Menu</i>	
Function	Next Menu
CANCEL	Figure 111 on page PANEL-15
ENABLE	Figure 111 on page PANEL-15
DISABLE	Figure 111 on page PANEL-15

- Cancel** Causes the Figure 111 on page PANEL-15 to appear.
- Enable** Allows the 3570 to automatically clean the tape drives when cleaning is required.
- Disable** The 3570 will not automatically clean the tape drives when cleaning is required.

If the display shows \*ENABLE, the tape drive will be cleaned automatically. If the display shows \*DISABLE, the operator must take action to clean the tape drive(s) when cleaning is required. If the display shows both the **ENABLE** and **DISABLE** menu options without asterisks in front, there is a mismatch in the settings for drive 1 and drive 2 (in 2 drive models). Select **ENABLE** or **DISABLE** and press **ENTER** to correct the mismatch.

**Note:** It is recommended that automatic cleaning be set to enable.

## Unload & Reset Menu

<i>Figure 115. Unload &amp; Reset Menu</i>	
Function	Next Menu
UNLOAD DRIVE	After "Status Screen" on page PANEL-5 to "Unload & Reset Menu"
RESET DRIVE	After confirmation, to "Status Screen" on page PANEL-5

- Unload Drive** Causes the device to rewind and unload the cartridge in the device. Press Enter to return to the Unload & Reset Menu.
- Reset Drive** Causes the tape drive to perform power-on reset.

## Services Menu

<i>Figure 116. Services Menu</i>	
Function	Next Menu
CANCEL	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
CHANGE LANGUAGE	Figure 117
STATISTICS...	Figure 118
MICROCODE LEVEL	After microcode level display, to Figure 116
RESET DRIVE	After confirmation, to Figure 116
FORCE ERROR DUMP	After confirmation, to Figure 116

**Cancel** For Model B02 or B12, causes the Figure 108 on page PANEL-13 to appear. For Model B01 or B11, causes the Figure 107 on page PANEL-13 to appear.

**Change Language** Allows the operator to select the operator panel language.

**Statistics** Displays the number of times certain events occurred.

**Microcode Level** Displays the microcode level.

**Reset Drive** Causes the library to perform a power-on reset.

**Force Error Dump** For service use only.

## Change Language Menu

<i>Figure 117. Change Language Menu</i>	
Function	Next Menu
CANCEL	Figure 116
ENGLISH	Figure 107 on page PANEL-13
SPANISH	Figure 107 on page PANEL-13
GERMAN	Figure 107 on page PANEL-13

**Cancel** Causes the Figure 116 to appear.

**<language>** Allows the operator to select the operator panel language. The languages supported are English, German, or Spanish.

## Statistics Menu

<i>Figure 118. Statistics Menu</i>	
Function	Next Menu
CANCEL	Figure 116
SHOW STATISTICS	Figure 119 on page PANEL-20
SAVE	Figure 118

**Cancel** Causes the Figure 116 to appear.

**Show Statistics** Causes the Figure 119 on page PANEL-20 to appear.

**Save**

Causes the statistics to be saved in nonvolatile storage.



## Show Statistics Menu

<i>Figure 119. Show Statistics Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 118 on page PANEL-18
MOUNTS TO DRIVE	Figure 119
PRIORITY MOUNTS	Figure 119
MAGAZINE MOUNTS	Figure 119
CLEANING MOUNTS	Figure 119
POWER-ON HOURS	Figure 119

**Cancel** Causes the Figure 118 on page PANEL-18 to appear.

**Mounts to Drive** Displays the total number of times a cartridge was mounted in the drive.

**Priority Mounts** Displays the total number of times a cartridge was loaded in the priority cell.

**Magazine Mounts** Displays the total number of times a cartridge was loaded in any of the cells of the magazine.

**Cleaning Mounts** Displays the total number of times a cartridge was moved from the cleaning cartridge slot to the tape drive.

**Power-on Hours** Displays the total number of hours the device was powered on.



## Clean Menu

<i>Figure 120. Clean Menu</i>	
Function	Next Menu
CANCEL	Figure 107 on page PANEL-13
CLEAN DRIVE	Figure 108 on page PANEL-13 (Model B02 or B12)
INSERT CLEANING TAPE	–
REMOVE CLEANING TAPE	–
AUTO CLEAN OFF/ON	–

**Cancel** Causes the Figure 107 on page PANEL-13 to appear.

**Clean Drive** After selecting the drive to be cleaned (Model B02 or B12 only), it loads the cleaner cartridge from the internal cleaner slot into the drive. Once cleaned, the cartridge is returned to the internal cleaner slot. See “Drive Head Cleaning Procedure” on page PROC-28.

**Insert Cleaning Tape** Moves the cleaning cartridge from the priority slot to the internal cleaner slot. If a cartridge is not present, a message will be displayed that prompts the operator to put the cleaning cartridge into the priority slot. See “Setting the SCSI Address and Configuring the Library” on page INST-46.

**Remove Cleaning Tape** Moves the cleaning cartridge from the internal cleaner slot to the priority slot.

**Auto Clean (OFF/ON)** When ON, this option allows the library to automatically load the cleaning cartridge from the internal cleaner slot when the drive needs to be cleaned.

## Recovery Menu

<i>Figure 121. Recovery Menu</i>	
Function	Next Menu
CANCEL	After Figure 108 on page PANEL-13 to Figure 107 on page PANEL-13
PRIORITY CELL	Go to Figure 107 on page PANEL-13
2-20	Figure 122

**Cancel** Causes the Figure 108 on page PANEL-13 to appear.

**Priority Cell** Moves the cartridge to the export position in the priority cell.

**<value>** Allows the operator to select the magazine cell where the cartridge will be placed.

## Import Export Menu

<i>Figure 122. Import Export Menu</i>	
Function	Next Menu
CANCEL	Figure 121
IMPORT	Figure 107 on page PANEL-13
EXPORT	Figure 107 on page PANEL-13

**Cancel** Causes the Figure 121 to appear.

**Import** Causes the cartridge to be placed in the import position of the desired magazine cell.

**Export** Causes the cartridge to be placed in the export position of the desired magazine cell.

## Confirm Mode Change Menu

<i>Figure 123. Confirm Mode Change Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Previous menu
PROCEED	Figure 107 on page PANEL-13

When the Menu Mode button is pressed, this menu is displayed when switching from operator to service mode or service to operator mode (dependent on job activity).

### **Cancel**

Displays the previous menu that was active before the Menu Mode button is pressed.

### **Proceed**

Forces the device offline if going to service mode.

If write activity exists, any write data in the device is lost. The Proceed option results in job termination.

**Attention:** The device should be quiesced by the host (that is, the device should be varied offline) before entering service mode. The online status of the device is restored when changing from service mode to operator mode.

---

## CE Mode Menus

The CE menus are always displayed in English. The CE menus appear on the operator panel when you press the Mode push button.

### Attention

1. Entering CE mode causes the device to go offline to all initiators on the bus. Any commands-in-progress are completed. A verification-warning message is presented on the display before the offline action is initiated.
2. Pressing the Mode push button again, while in CE mode, returns the 3570 online to the host and to Operator mode.
3. The device should be quiesced by the host (vary device offline) before taking the device offline by entering CE mode or by powering off the device.

The first display confirming the CE mode change appears as follows:

```
WARNING:  
SERVICE  
PERSONNEL  
ONLY
```

Figure 124. Warning Message

Press enter and the next screen will appear asking you to confirm the request for a mode change.

```
CONFIRM MODE CHG  
>CANCEL  
PROCEED
```

Figure 125. Confirm Mode Change

The Confirm Mode Change Menu, Figure 123 on page PANEL-23 is described below.

## Confirm Mode Change Menu

Figure 123 on page PANEL-23 shows the Confirm Mode Change menu.

<i>Figure 126. Confirm Mode Change</i>	
Function	Next Menu
CANCEL	Previous menu
PROCEED	Figure 107 on page PANEL-13 if no job, or Figure 127 on page PANEL-25 if job is in progress.

When the Change Mode push button is pressed, this menu may be displayed when switching from operator to CE mode or CE to operator mode (dependent on job activity).

- Cancel** Displays the previous menu that was active before the Change Mode push button is pressed.
- Proceed** Forces the ports offline if going to CE mode and no job was in progress. If a job was active at the time, a new menu shown below is displayed:

```

RESET DRIVE...
>CANCEL..
RESET DRIVE...
FORCE ERROR DUMP...

```

Figure 127. Confirm Mode Change-Proceed Menu

The RESET DRIVE option results in job termination.

**Attention:** The device should be quiesced by the host (vary device offline) before taking the device offline, powering off the device, or entering CE mode.

**Note:** The online status of the SCSI ports is restored when changing from CE mode to operator mode.

Press the Scroll Down push button until the arrow head lines up with the Proceed option, then press the Select push button to obtain the following CE Option menu:

```

CE OPTION
>VERIFY FIX
DUMP
FMR TAPE      +

```

Figure 128. Verify Fix Menu

The CE Option menu contains the following options. You must press the Scroll Down push button to view all the options. The plus (+) indicates that more options are available. The two options shown outside the screen will be seen when the Scroll down push button is pressed.

```

CE OPTION
>VERIFY FIX
DUMP
FMR TAPE      +

```

Figure 129. Options Menu (Complete)

```

ERROR LOG
UTILITIES

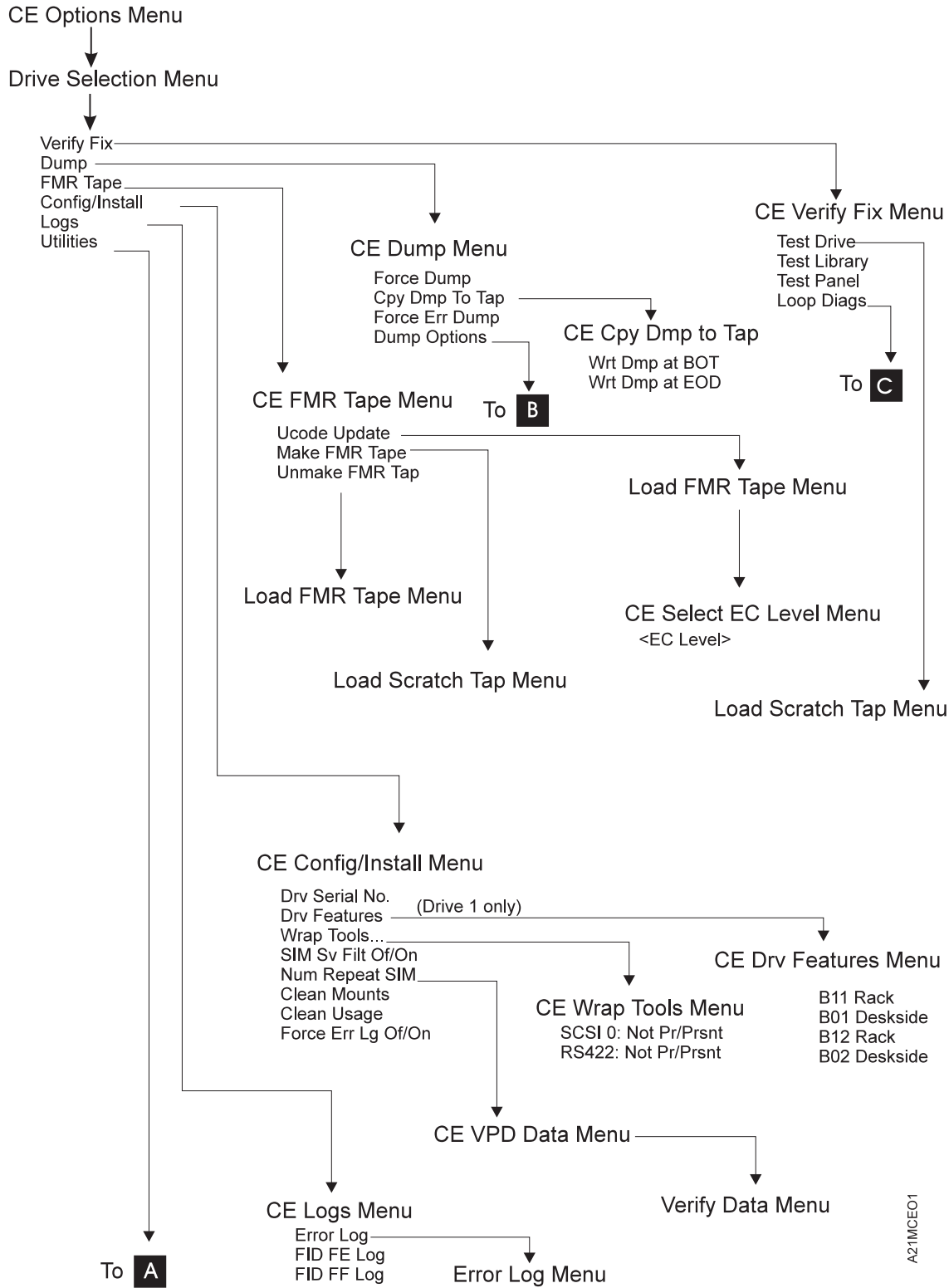
```

**Note:** Any menu option that is preceded by an asterisk (\*) requires intervention prior to that option being available for selection. For example, if the option **\*UNLOAD DRIVE** appears, it means that there is no drive loaded at this time. To remove the (\*), simply select START and load a cartridge. Another example is if **\*START** appears in a menu, it means that a cartridge is already loaded and at load point. To remove the (\*), simply select the UNLOAD DRIVE option and unload the cartridge.

## CE Panel Flow Charts

Figure 106 on page PANEL-12 shows the operator panel functions and Figure 130 on page PANEL-27 shows the CE panel functions. Bold text in the figures shows the names of the menus.

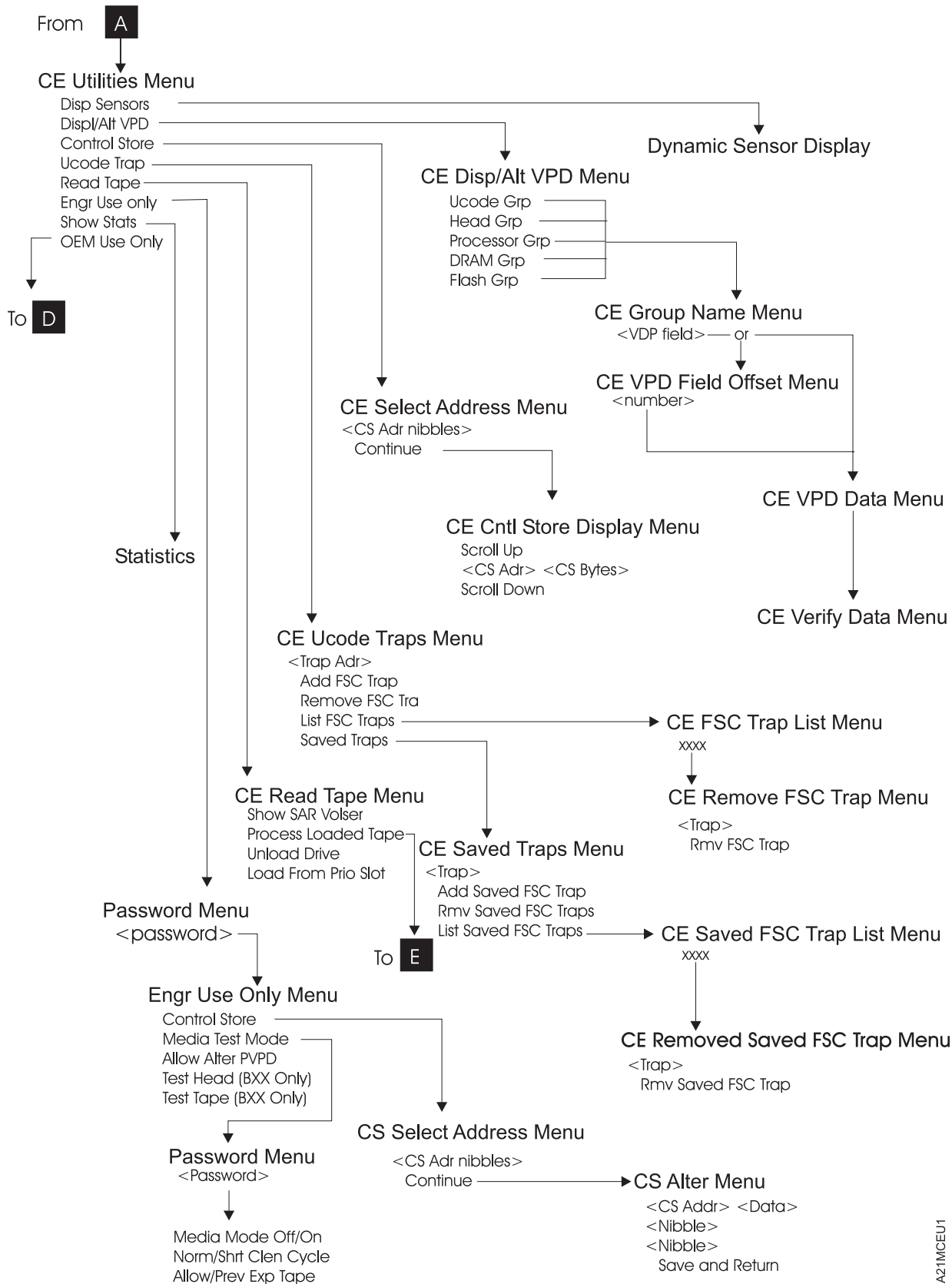
The Operator Menus are available immediately after successful completion of the power-on self-test.



PANEL

Figure 130 (Part 1 of 3). CE Panel Menu

A21MCE01



A21MCEU1

Figure 130 (Part 2 of 3). CE Panel Menu



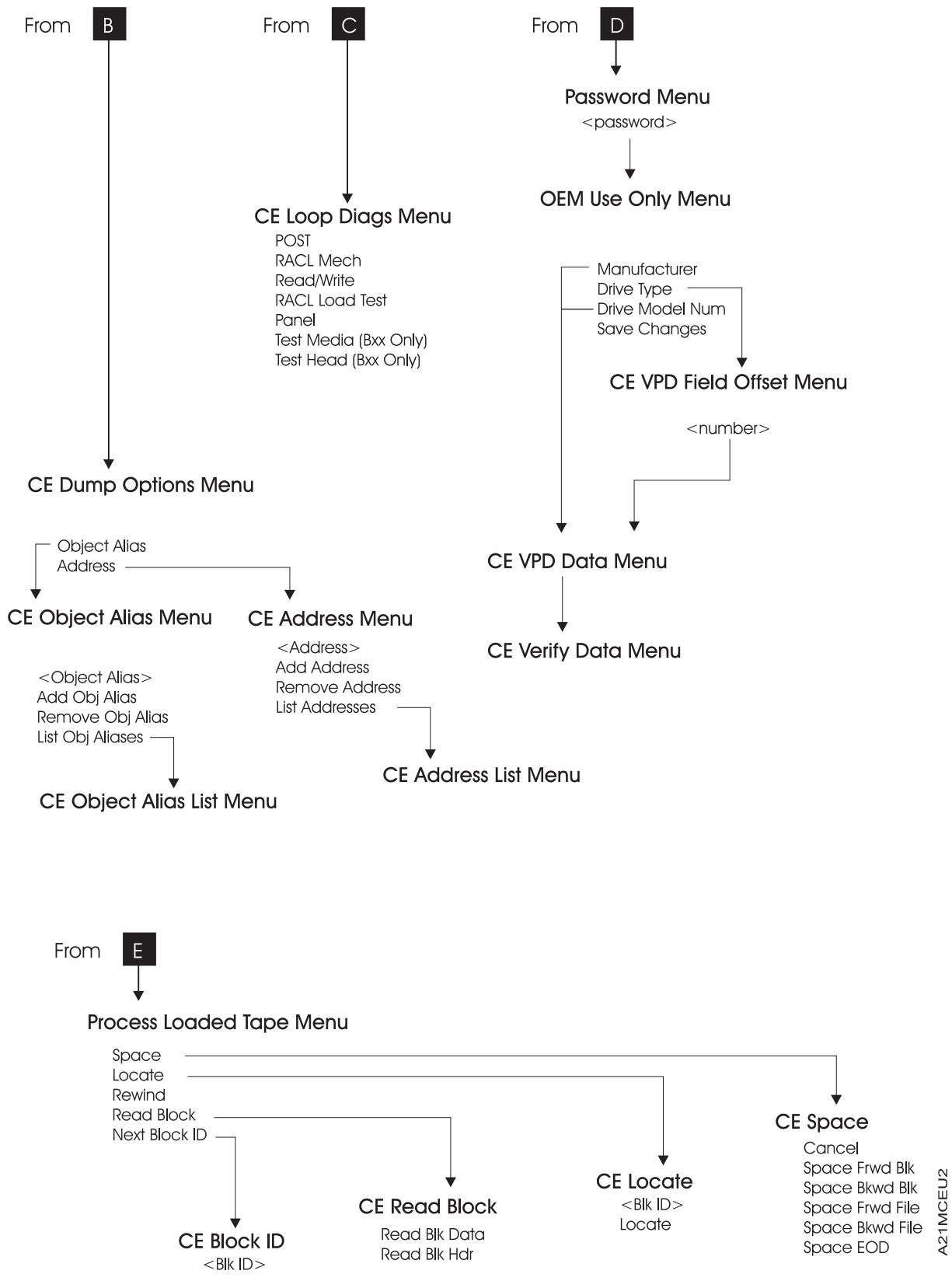


Figure 130 (Part 3 of 3). CE Panel Menu

## CE Panel Menus

**Attention:** Entering CE mode causes all drives in the device to immediately go offline to all host systems (initiators) attached to it; therefore, any current read/write activity results in job termination. In general, the device should be quiesced by the host (vary device offline) before taking the device offline, powering off the device, or entering CE mode.

**Note:** An option marked with an asterisk indicates the option is not available for selection or the option is the selection currently in use by the library. For example: if the drive is not loaded with a tape cartridge, the UNLOAD DRIVE option will be marked with an asterisk, indicating it is not available for selection.

The following menus are accessed by pressing the Change Mode push button.

**CE Options Menu:** Figure 131 shows the CE Options menu.

<i>Figure 131. CE Options</i>	
Function	Next Menu
VERIFY FIX...	Figure 132
DUMP...	Figure 136 on page PANEL-33
FMR TAPE...	Figure 141 on page PANEL-36
CONFIG/INSTALL...	Figure 149 on page PANEL-41
LOGS...	"CE Logs Menu" on page PANEL-44
UTILITIES...	Figure 157 on page PANEL-47

**Verify Fix** Allows the CE to check *good machine* operation.

**Dump** Allows the CE to move dump data.

**FMR Tape** Allows the CE to perform microcode updates.

**Config/Install** Allows the CE to customize the device to meet the customer's requirements at installation.

**Logs** Allows the CE to view or reset the CE logs.

**Utilities** Allows the CE to display control store and register data from any valid address. Use this option with assistance from support personnel.

**CE Verify Fix Menu:** Figure 132 shows the CE Verify Fix menu. This menu allows the CE to choose tests to run.

**Note:** See "CE Verify Fix on Library Models" on page PROC-13 for detailed information about running the test.

<i>Figure 132. CE Verify Fix</i>	
Function	Next Menu
CANCEL	Figure 131
TEST DRIVE	Figure 133 on page PANEL-31
TEST LIBR	Figure 133 on page PANEL-31
TEST PANEL	Figure 135 on page PANEL-32
LOOP DIAGS	Figure 135 on page PANEL-32

**Cancel** Causes the CE Options menu to appear.

- Test Drive**      Runs most of the tests that normally occur when power is switched on to the drive. Also, the CE is requested to load a tape to run the tape motion tests. The test checks motors, sensors, memory, and the card pack.
- Test LIBR**      Runs tests on the random-access cartridge loader.
- Test Panel**      Runs tests on the operator panel display. Allows the service representative to visually check all pixels on the operator panel display.
- Loop Diags**      Allows the service representative to loop the diagnostic tests from Figure 135 on page PANEL-32.

When a test starts to run, the CE WAIT Menu shown in Figure 133 appears.

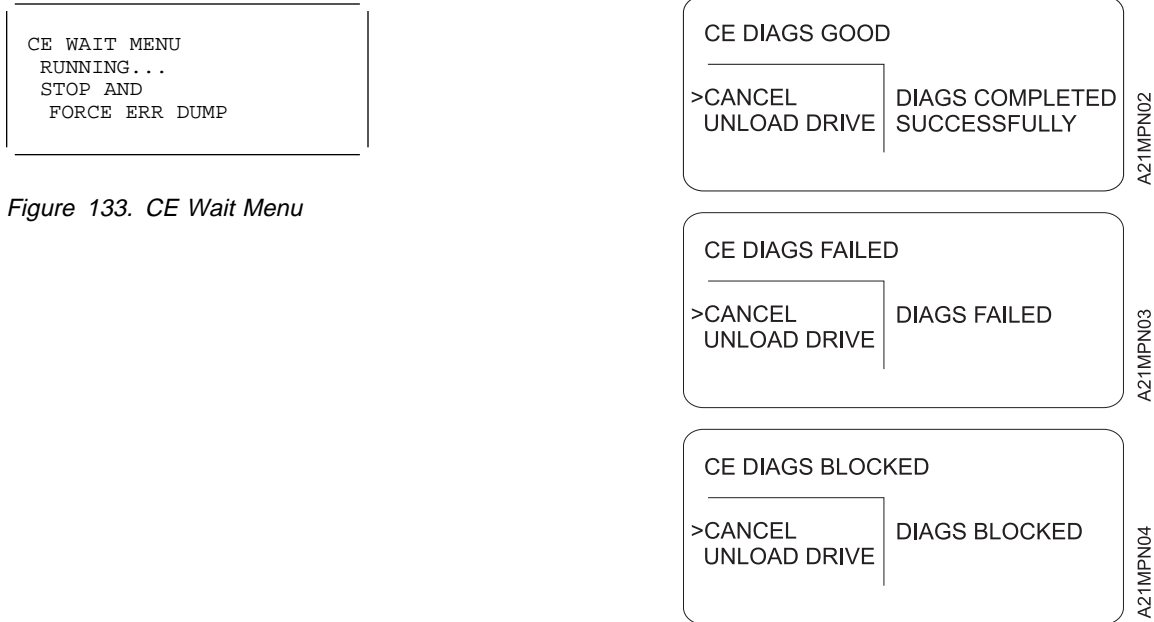


Figure 133. CE Wait Menu

Figure 134. Final Status

When the test needs a tape, Figure 145 on page PANEL-38 is displayed. At that time, you should load a scratch cartridge into the priority cell and select LOAD FROM PRI SLOT. When the cartridge is loaded and at ready point, press ENTER and select **Process Loaded Tape**. At that time, Figure 133 is again displayed until the test is completed or until an error is detected.

Allow the tests to run to completion. When a test ends, the results are displayed on Figure 134 (the second screen shows an example of a failure).

**Attention:** Do not select **Force Err Dump** from the menu when the tests are running unless you are sure the 3570 is in a hung condition. Also, when the tests are running, do not change to operator mode by pressing the Change Mode push button. Aborting a test can cause unexpected results.

**Note:** Choosing **Force Err Dump** from the menu forces the SCSI port to go *offline* or keeps it offline.

The CE DIAG BLOCKED menu can occur if the drive goes through microcode recovery, or if a tape cartridge was loaded when diagnostics were requested. To recover from the first condition, power the drive off and then back on. To recover from the second, unload the tape and request diagnostics again. Use the FID that was displayed and go to the START section.

**CE Loop Diag Menu:** Figure 135 shows the CE Loop Diag menu. This menu allows the CE to select tests to run in loop mode.

<i>Figure 135. CE Loop Diag</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 132 on page PANEL-30
POST	Figure 135
LIBRARY MECH	Figure 135
READ/WRITE	Figure 135
LIBRARY LOAD TEST	Figure 135
PANEL	Figure 135
Test Head	Figure 135
Test Tape	Figure 135

**To stop any test, select STOP RUNNING between test cycles.**

<b>Cancel</b>	Causes the CE Verify Fix menu to appear.
<b>POST</b>	(Power On Self Test) Runs most of the tests that normally occur when power is switched ON to the drive. The test checks motors, sensors and memory. This test also includes the Library Mech test.
<b>Library Mech Test</b>	Runs tests on the library mechanism. The test checks motors, sensors, and the library control card.
<b>Read/Write Test</b>	Runs a Read/Write test. This test takes approximately 3 minutes for each cycle. A scratch tape must be loaded before selecting this test.
<b>Library Load Test</b>	Runs tests on the library cartridge load mechanism. The library should be in <b>random</b> mode, with a cartridge loaded into the <b>import</b> position of the priority cell. The test will move the cartridge from the priority cell into every available empty magazine cell, then back to the priority cell in the <b>export</b> position. To restart the test it will be necessary to manually move the cartridge into the <b>import</b> position.
<b>Panel Test</b>	Runs tests on the operator panel display. Allows the service representative to visually check all pixels on the operator panel display.
<b>Test Head</b>	<b>ATTENTION: A known good scratch tape must be loaded before starting the test.</b> Causes extended test of head, head cables and associated circuitry. Test will run for a minimum of three minutes.
<b>Test Tape</b>	<b>ATTENTION: This test assumes that the drive hardware is good working condition. The tape to be tested must be loaded before starting the test.</b> Test will run an extended test of the tape and will execute for a minimum of five minutes.

**CE Main Dump Menu:** Figure 136 shows the CE Main Dump menu. This menu allows the CE to force a dump or to copy a dump from dynamic random access memory (DRAM) to a cartridge.

<i>Figure 136. CE Dump Menu</i>	
Function	Next Menu
CANCEL	Figure 131 on page PANEL-30 (See definition below)
FORCE DUMP	—
CPY DMP TO TAP	Figure 140 on page PANEL-35
FORCE ERR DUMP	—
DUMP OPTIONS	Figure 137 on page PANEL-34.

The *dump* icon (!) appears when the dump is available, and remains on the screen to indicate that trace data is stored in the device. The icon is not displayed after the host takes a dump or the dump is written to tape.

**Attention:** Trace data is volatile and is lost if you press the Reset push button or switch off power to the device.

- Cancel** Causes the CE Options menu to appear.
- Force Dump** Causes a dump to control store DRAM to occur. The initiator can retrieve the data via a Read Buffer command to the control store DRAM.  
**Attention:** Do not use this option if a FID1 condition has already caused a dump to be created. For this case, the dump data of interest is lost if you execute the Force Dump function.  
Do not use Force Dump if the bus is in a hung state; instead, use the Force Err Dump option.
- Copy Dump to Tape** Causes the Figure 140 on page PANEL-35 to appear.
- Force Error Dump** Causes a recovery procedure in which the microcode is reloaded. This option is used if a microcode-hang condition exists (that is, the host cannot communicate with the drive and no hardware fault is detected).  
When a hang condition exists, the host can attempt to request a microcode dump through a SCSI port, but does not receive it from the drive.  
This option is also used if a microcode dump is needed and the Force Dump option on this menu cannot provide a dump. The host is then able to successfully request the dump information via the SCSI port, or the CE can use the Copy Dump to Tape option on this menu.
- Dump Options** Allows the CE to customize the dump based on Engineering or Support request.

**CE Dump Options Menu:** Figure 141 on page PANEL-36 shows the Dump Options menu.

<i>Figure 137. Dump Options Menu</i>	
Function	Next Menu
CANCEL	Figure 136 on page PANEL-33
OBJECT ALIAS...	Figure 138
ADDRESS...	Figure 139 on page PANEL-35

**Cancel** Causes the Figure 136 on page PANEL-33 to appear.

**Object Alias** Allows the CE to enter Object Alias data for dump options.

**Address** Allows the CE to enter Control Store addresses for dump options.

**CE Object Alias Menu:** Figure 138 shows the Object Alias menu.

<i>Figure 138. Object Alias Menu</i>	
Function	Next Menu
CANCEL	Figure 141 on page PANEL-36
OBJECT ALIAS (4 characters displayed vertically)	—
ADD OBJECT ALIAS	—
REMOVE OBJECT ALIAS	—
LIST OBJECT ALIAS...	"List Object Alias Menu"

**Cancel** Causes the Figure 141 on page PANEL-36 to appear.

**Object Alias** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes a new menu to appear where you can select 0–F.

**Add Object Alias** Allows the CE to add Object Alias data to the dump options.

**Remove Object Alias** Allows the CE to remove Object Alias data from dump options.

**List Object Alias** Allows the CE to list Object Alias data from the dump options.

**CE Address Menu:** Figure 139 shows the Address menu.

<i>Figure 139. Address Menu</i>	
Function	Next Menu
CANCEL	Figure 141 on page PANEL-36
ADDRESS (4 characters displayed vertically)	—
ADD ADDRESS	—
REMOVE ADDRESS	—
LIST ADDRESS	"List Address Menu"

**Cancel** Causes the Figure 141 on page PANEL-36 to appear.

**Address** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes a new menu to appear where you can select 0–F.

**Add Address** Allows the CE to add Address data to the dump options.

**Remove Address** Allows the CE to remove Address data from dump options.

**List Address** Allows the CE to list Address data from the dump options.

**CE Copy Dump to Tape Menu:** Figure 140 shows the CE Copy Dump to Tape Menu. This menu copies the dump data to a cartridge. A menu prompts the CE to load a scratch tape.

**Attention:** Data on the tape may be overwritten. The Final Status menus, Figure 143 on page PANEL-37 and Figure 144 on page PANEL-37 indicate the status of the copy to tape (successful copy or unsuccessful copy). This option is invalid if no dump data exists.

<i>Figure 140. CE Copy Dump to Tape Menu</i>	
Function	Next Menu
CANCEL	Figure 136 on page PANEL-33
WRT DMP AT BOT	Figure 145 on page PANEL-38
WRT DMP AT EOD	Figure 145 on page PANEL-38

**Cancel** Causes Figure 136 on page PANEL-33 to appear.

**WRT DMP AT BOT** Copies the dump to the beginning of a tape cartridge.

**WRT DMP AT EOD** Appends the dump to data already written on the tape.

**CE FMR Tape Menu:** Figure 141 shows the FMR Tape menu.

<i>Figure 141. FMR Tape Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 131 on page PANEL-30
UCODE UPDATE ...	Figure 147 on page PANEL-40
MAKE FMR TAPE...	Figure 145 on page PANEL-38
UNMAKE FMR TAPE...	Figure 147 on page PANEL-40

**Cancel**

Allows the CE to abort an FMR and return to the CE Options menu.

**Ucode Update**

Allows the CE to replace the microcode in the device from a field microcode replacement (FMR) tape and to update the FMR cartridge with the microcode. A menu prompts the CE to load the FMR tape in the device. When the 3570 reads the FMR tape, it checks the EC levels on the tape. If the tape does not contain the EC level of the drive, it automatically writes the microcode to the FMR tape. It then displays the EC level on the next screen.

Selecting this option causes the Figure 142 on page PANEL-37 to appear.

While this option is running, the Figure 133 on page PANEL-31 is displayed. Upon exit, Final Status Menu Figure 143 on page PANEL-37 is displayed.

**Make FMR Tape**

Allows the CE to create a field microcode replacement (FMR) tape from a scratch tape. The FMR tape contains the current level of microcode that is active in the device. A menu prompts the CE to load a scratch tape in the device. While the option is running, the Figure 133 on page PANEL-31 is displayed. After the tape is written, the final status menu, Figure 143 on page PANEL-37 will indicate if the operation was successful.

**Unmake FMR Tape**

Allows the CE to convert an FMR tape to a scratch tape. A menu prompts the CE to load an FMR tape in the device. While the option is running, the Figure 133 on page PANEL-31 is displayed. After the tape has the header information changed, the final status menu, Figure 143 on page PANEL-37 will indicate if the operation was successful.



**CE Select EC Level Menu:** Figure 142 shows the Select EC menu. This menu is displayed when the device loads an FMR tape. The device reads all the EC levels and displays them on this menu. The invalid EC levels are displayed in a lighter font. The message lines display the EC level running in the device. The ECs are displayed in the same order as they appear on tape. The CE picks which EC level to load into the device.

After the FMR tape is read, a power-on reset or CE reset is needed to activate the microcode that was just loaded.

**Operational Note:** If you insert the FMR cartridge and the EC level of the code is not on the cartridge, the microcode is automatically copied from the drive to the cartridge.

<i>Figure 142. Select EC Level</i>	
Function	Next Menu
CANCEL	Figure 131 on page PANEL-30
EC=aaaaaaa LL=bbbb	—
EC=ccccccc LL=dddd	—
EC=eeeeeee LL=ffff	—

**Cancel** Allows the CE to abort an FMR and return to the CE Options menu.

**EC Level** Allows the CE to pick which EC level to load into the device.

The latest EC level is determined by the link level (LL), as the EC level may not always increment to a higher number. The following example shows that the second entry is the latest level microcode.

```
EC=6C56789 LL=4D D
EC=3C56789 LL=5B 2 (highest EC level)
```

The Final Status menu shows the completion status of the operation you selected and allows you to select the options shown. (CE ACTN SUCCESS indicates that the CE action was successful.) If a failure occurs, the Final Status menu indicates CE ACTN FAILED. This failure can occur if the drive cannot read or write the tape.

```
CE ACTN SUCCESS
>CANCEL
UNLOAD DRIVE
SHOW STATUS +
```

Figure 143. Final Status Menu

```
CE ACTN FAILED
>CANCEL
UNLOAD DRIVE
SHOW STATUS +
```

Figure 144. Final Status Menu

**CE Load Scratch Tape Menu:** Figure 145 shows the menu that prompts the CE to load a scratch tape into the priority slot. The scratch tape should not have a label or data unless it is OK to overwrite it.

If the scratch cartridge in the drive has a volser written on the tape, it is overwritten.

<i>Figure 145. Load Scratch Tape</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Previous menu
PROC LOAD TAPE	Next menu
UNLOAD DRIVE	Figure 145
SHOW STATUS	“Status Screen” on page PANEL-5
LOAD FROM PRI SLOT	—

**Cancel** Allows the CE to return to the CE Options or other menu depending upon the previous menu. See Figure 130 on page PANEL-27 for details.

**Process Loaded Tape** If scratch tape is loaded and at ready point, then a **new** menu will be displayed, depending on the previous menu. See Figure 130 on page PANEL-27 for detail.

**Unload Drive** Allows the CE to unload the cartridge from the drive.

**Show Status** Displays the Status screen.

**Load From PRI Slot** Loads a cartridge from the priority slot into the drive.

## Messages That May Result

<i>Figure 146. Load Scratch Tape—Messages That May Result</i>	
<b>Message</b>	<b>Meaning and Action To Take</b>
WRONG TAPE TYPE	An FMR tape was loaded. Reload with a scratch tape.
TAPE NOT AT LOAD PT	Tape was not at load point and is rewinding. Wait.
TAPE WRITE PROT'D	Tape is write protected. Unprotect it before proceeding.
USE UNLABELED TAPE	A message to remind you to use an unlabeled tape. Load an unlabeled tape unless the tape will be allowed to be overwritten. If a label is present, the label and all data will be overwritten.

PANEL

**CE Load FMR Tape Menu:** Figure 147 shows the menu that prompts the CE to load the FMR tape into the priority slot.

<i>Figure 147. Load FMR Tape</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Previous menu
PROC LOAD TAPE	Next menu
UNLOAD DRIVE	Figure 147
SHOW STATUS	"Status Screen" on page PANEL-5
LOAD FROM PRI SLOT	—

**Cancel** Allows the CE to return to the CE Options or other menu depending upon the previous menu. See Figure 130 on page PANEL-27 for details.

**Process Loaded Tape** If FMR tape is loaded and at ready point, then a **new** menu will be displayed, depending on the previous menu. See Figure 130 on page PANEL-27 for detail.

**Unload Drive** Allows the CE to unload the cartridge from the drive.

**Show Status** Displays the Status screen.

**Load From PRI Slot** Loads a cartridge from the priority slot into the drive.

***Messages That May Result***

<i>Figure 148. Load FMR Tape—Messages That May Result</i>	
<b>Message</b>	<b>Meaning and Action To Take</b>
WRONG TAPE TYPE	A scratch tape was loaded. Reload with an FMR tape.
TAPE NOT AT LOAD PT	Tape was not at load point and is rewinding. Wait.
TAPE WRITE PROT'D	Tape is write protected. Unprotect it before proceeding.
USE UNLABELED TAPE	A message to remind you to use an unlabeled tape. Load an unlabeled tape unless the tape used can be overwritten. If a label is present, the label and all data will be overwritten.

**CE Config/Install Menu:** Figure 149 shows the Config/Install menu. The default values are in a bold font.

**Note:** The CE Config/Install menu options display the current status. For example, if an option says Forced Error Logging Off, that means that forced error logging is off. To turn it on, select the option. The option will change to show the new current status, Forced Error Logging On.

<i>Figure 149. Config/Install</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 131 on page PANEL-30
DRV SERIAL NUMBER	Figure 150 on page PANEL-42
DRV FEATURES...	Figure 151 on page PANEL-42
WRAP TOOLS.....	Figure 152 on page PANEL-43
SIM SV FILT ON/ <b>OFF</b>	—
NUM REPEAT SIM	—
CLEAN MOUNTS	—
CLEAN USAGE	—
FORCE ERROR LOG ON/ <b>OFF</b>	—

**Cancel**

Causes the CE Options menu to appear.

**Drv Serial No**

Causes the Figure 150 on page PANEL-42 to appear.

**Drv Features**

Allows the CE to set items from Figure 151 on page PANEL-42.

**Wrap Tools**

Causes the Figure 152 on page PANEL-43 to appear.

**SIM Sev Filt On/Off**

Allows the CE to filter the messages displayed on the panel. When this option is set to **On**, only *acute* and *serious* severity service information messages (SIMs) are displayed. *Moderate* and *service-related* severity SIMs are not displayed. When this option is set to Off, all SIMs are displayed. The default is *Off*.

**Num Repeat SIMs**

Allows the CE to determine how many times to repeat sending the same SIMs to the host. For example, if you set the value to 3, the SIM is sent to the host when a SIM is generated, again eight hours later, then again eight hours later. You cannot change the time between the presentation of SIMs, which is eight hours.

**Clean Mounts**

Allows the CE to change the quantity specifying the number of mounts required for the drive before a **clean** message is posted on the operator panel.

**Clean Usage**

Allows the CE to change the quantity specifying the number of bytes processed by the drive before a **clean** message is posted on the operator panel.

**Force Error Log On/Off**

Allows the CE to turn error logging on. When On is displayed, deferred-check conditions are reported to the host. Therefore, temporary errors are reported in the sense data. The default is *Off*. This selection is normally used because of specific requests from support personnel.

**CE Drive Serial Number Menu:** Figure 150 shows the Drive Serial Number menu.

This menu allows the CE to set the serial number of the drive from the operator panel.

**Note:** .

<i>Figure 150. CE Drive Serial Number</i>	
Function	Next Menu
CANCEL	Figure 149 on page PANEL-41
DISP SERIAL NO	—
ALTER SERIAL NO	Figure 162 on page PANEL-51

**Cancel** Causes the Figure 149 on page PANEL-41 to appear.

**Disp Serial No** Displays the drive serial number in the format **0000 000n nnnn**.

**Alter Serial No** Allows the CE to enter the drive serial number field, using the VPD Field Offset menu and the VPD Data menu. See “Drive Serial Number—Library Models Only” on page PROC-36 for detailed instructions.

**CE Drive Features Menu:** Figure 151 shows the Drive Features menu.

This menu allows the CE to set the model number of the library from the operator panel. The default values are in bold font.

**Note:** A drive will be configured by microcode as a B00 Model automatically when the library is disconnected from the logic and the drive is powered on. Also, when a B00 Model is installed into a library, it will be automatically configured as a B01. The CE can override this with the operator panel and make it a B11.

<i>Figure 151. CE Drv Features</i>	
Function	Next Menu
CANCEL	Figure 149 on page PANEL-41
B11 RACK	—
<b>B01 Standalone</b>	—
B12 RACK	—
<b>B02 Standalone</b>	—

**Cancel** Causes the Figure 149 on page PANEL-41 to appear.

**B11 B21 Rack (see note)** Allows the CE to configure the library as a Model B11 which is a rack model.

**B01 Standalone** Allows the CE to configure the library as a Model B01 which is a stand-alone model.

**B12, B22 Rack (see note)** Allows the CE to configure the library as a Model B12 which is a rack model with two drive units.

**B02 Standalone** Allows the CE to configure the library as a Model B02 which is a stand-alone model with two drive units.

**Note:** Models B21 and B22 look to the host initiator as Models B11 and B12 respectively. When selecting the option, select B11 for Models B11 and B21, and select B12 for Models B12 and B22.

**CE Wrap Tools Menu:** Figure 152 on page PANEL-43 shows the CE Wrap Tool Menu.

<i>Figure 152. CE Wrap Tools Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 149 on page PANEL-41
SCSI 0: NOT PR/PRSNT	—
RS422: NOT PR/PRSNT	—

**Cancel** Causes the Figure 149 on page PANEL-41 to appear.

**SCSI 0: NOT PR/PRSNT** Indicates whether or not the SCSI wrap tool is installed on the SCSI connector. PRSNT indicates the wrap tool is installed. NOT PR indicates the wrap tool is not installed.

**RS422: NOT PR/PRSNT** Indicates whether or not the RS422 wrap tool is installed on the RS422 connector. PRSNT indicates the wrap tool is installed. NOT PR indicates the wrap tool is not installed.

**CE Logs Menu:** Figure 153 shows the Logs menu. This menu allows the CE to access the CE error logs.

<i>Figure 153. CE Logs</i>	
Function	Next Menu
CANCEL	Figure 131 on page PANEL-30
ERROR LOG...	"CE Error Log Menu"
FID FE LOG...	Figure 155 on page PANEL-45
FID FF LOG...	Figure 156 on page PANEL-46

**Cancel** Causes the Figure 131 on page PANEL-30 to appear.

**Error Log** Allows the CE to view the Error Log.

**FID FE Log** Allows the CE to view the FID FE log.

**FID FF Log** Allows the CE to view the FID FF log.

The **CE Error Log** logs every FID or ATTN message posted to the operator panel.

The **FID FE Log** logs a filtered subset of all sense data sent to the host with a FID of **FE**.

The **FID FF Log** logs a filtered subset of all sense data sent to the host with a FID of **FF**.

**CE Error Log Menu:** Figure 154 shows an example of the menu when the log contains entries. The format is:

```
FIDx yy                ATTN DRV/LIBR
aaaa bbbb cccc        --OR--      (detailed message)
dddd hh : mm : ss    dddd hh : mm : ss
```

See Figure 104 on page PANEL-9 for a description of the fields.

<i>Figure 154. CE Error Log</i>	
Function	Next Menu
CANCEL or No Entries	Figure 153 on page PANEL-44
CLEAR ERR LOG	Figure 153 on page PANEL-44
FID1 DD 3130 0030 283A 0001 02:42:10	Figure 153 on page PANEL-44
FID1 CD 311A 311A 283A 0001 02:39:34	Figure 153 on page PANEL-44

**Time Stamp for CE Error Log:** A time stamp accompanies each error log entry. It is **not real time** but is **relative time**. A clock counter is started with power-on, but is saved each hour in VPD. The times may vary from real "relative time" depending on the number of power cycles taken, and timing between them.

```
dddd hh : mm : ss
Days hours mins secs
Time is relative to power on time for the logic card, not real time.
```

EXAMPLE:

```
ATTN DRV
LOAD/UNLOAD ERROR
1 2:42:28
```



- Cancel** Causes the Figure 153 on page PANEL-44 to appear.
- No Entries** Indicates that no entries are in the Error log. Choosing this option causes Figure 153 on page PANEL-44 to appear.
- Clear Err Log** Clears the error log if at least one entry is in the log. Returns to Figure 153 on page PANEL-44.
- FID1 DD** This example indicates a possible fault with one of the sensors. The fault symptom codes are 3130 and 0030. The next character (2 in 283A) represents the microcode increment followed by the microcode link (83A). A "relative time" time stamp follows. Choosing this option causes Figure 153 on page PANEL-44 to appear.
- FID1 CD** This example indicates a possible fault with the cartridge present sensor. The fault symptom codes are 311A. The next character (2 in 283A) represents the microcode increment followed by the microcode link (83A). A time stamp follows. Choosing this option causes Figure 153 on page PANEL-44 to appear.

The maximum entry in the Error log is 30. If a fault is detected and the log contains 30 entries, the oldest entry is scrolled off the bottom and the newest FID is put in position 1 (the first position in the list).

**CE FID FE Log Menu:** The **FID FE Log** logs a filtered subset of all sense data sent to the host with a FID of **FE**.

Figure 155 shows an example of the menu when the log contains entries. See "CE Error Log Menu" on page PANEL-44 for format information.

See "Error Log Analysis Procedure" on page PROC-48 for a procedure to assist you in analyzing the error log.

<i>Figure 155. CE FID FE Log</i>	
Function	Next Menu
CANCEL or No Entries	"CE Logs Menu" on page PANEL-44
CLEAR ERROR LOG	"CE Logs Menu" on page PANEL-44
FID yy aaaa bbbb cccc dddd hh:mm:ss	"CE Logs Menu" on page PANEL-44

- Cancel** Causes the "CE Logs Menu" on page PANEL-44 to appear.
- No Entries** Indicates that no entries are in the Error log. Choosing this option causes "CE Logs Menu" on page PANEL-44 to appear.
- CLEAR ERROR LOG** Allows the CE to erase the error log. This option will only be displayed when there is at least one entry in error log. Choosing this option causes "CE Logs Menu" on page PANEL-44 to appear.
- FID D3 E0** This example indicates a possible fault with the tape cartridge. The fault symptom codes are 3542 and 313F. The next character (1 in 1166) represents the model number followed by the microcode link (166). A time stamp follows. The last entry is the Volume Serial Number. If the Volume Serial Number is not known, it will show "UNKNOWN". Choosing this option causes Figure 153 on page PANEL-44 to appear.

The maximum entry in the FID FE log is 10.

Only the last 10 entries in the log are displayed. If a fault is detected and the log contains 10 entries, the oldest entry is scrolled off the end and the newest error is put in position 1 (the first position in the list).

**CE FID FF Log Menu:** The **FID FF Log** logs a filtered subset of all sense data sent to the host with a FID of **FF**.

Figure 156 shows an example of the menu when the log contains entries. See “CE Error Log Menu” on page PANEL-44 for format information.

See “Error Log Analysis Procedure” on page PROC-48 for a procedure to assist you in analyzing the error log.

<i>Figure 156. CE FID FF Log</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL or No Entries	“CE Logs Menu” on page PANEL-44
CLEAR ERROR LOG	“CE Logs Menu” on page PANEL-44
FID yy aaaa bbbb cccc dddd hh:mm:ss	“CE Logs Menu” on page PANEL-44

**Cancel** Causes the “CE Logs Menu” on page PANEL-44 to appear.

**No Entries** Indicates that no entries are in the Error log. Choosing this option causes “CE Logs Menu” on page PANEL-44 to appear.

**CLEAR ERROR LOG** Allows the CE to erase the error log. This option will only be displayed when there is at least one entry in error log. Choosing this option causes “CE Logs Menu” on page PANEL-44 to appear.

The maximum entry in the FID FF log is 10.

Only the last 10 entries in the log are displayed. If a fault is detected and the log contains 10 entries, the oldest entry is scrolled off the end and the newest error is put in position 1 (the first position in the list).

**CE Utilities Menu:** Figure 157 shows the Utilities menu.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 157. Utilities</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 131 on page PANEL-30
DISP SENSORS...	Figure 159 on page PANEL-49
DISP/ALT VPD...	Figure 160 on page PANEL-50
CONTROL STORE ...	Figure 165 on page PANEL-53
UCODE TRAP ...	Figure 167 on page PANEL-55
READ TAPE ...	Figure 168 on page PANEL-56
ENGR USE ONLY...	Figure 173 on page PANEL-60
SHOW STATS...	Figure 176 on page PANEL-63
OEM USE ONLY...	Figure 158 on page PANEL-48

**Cancel** Causes the Figure 131 on page PANEL-30 to appear.

**Disp Sensors** Allows the CE to display the library and drive sensors and change sensor states dynamically.

**Disp/Alt VPD** Allows the CE to display or change the vital product data (VPD). Change the VPD be done with assistance from support personnel.

**Control Store** Allows the CE to read any address in nonvolatile storage and control store.

**Ucode Trap** Allows the CE to set a specific FSC trap (error code match) in microcode to force a microcode dump.

**Read Tape** Allows the CE to display a portion of the data on the tape.

**Engr Use Only** Allows support personnel to access selected utilities.

**Show Stats** Allow the CE to display internal counts of activities.

**OEM Use Only** Allows OEM support personnel to access selected utilities.

**OEM Use Only Menu:** Figure 158 shows the OEM Use Only menu. This menu allows OEM support personnel to access the menu items, after entering the password.

<i>Figure 158. OEM Use Only Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
MANUFACTURER	Figure 163 on page PANEL-52
DRIVE TYPE	Figure 162 on page PANEL-51
DRIVE MODEL NUM	Figure 163 on page PANEL-52
SAVE CHANGES	—

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Manufacturer** Allows OEM support personnel to customize the **manufacturer** field in the VPD Data menu.

**Drive Type** Allows OEM support personnel to customize the **drive type** field, using the VPD Field Offset menu and the VPD Data menu.

**Drive Model Num** Allows OEM support personnel to customize the **drive model number** field in the VPD Data menu.

**Save Changes** Stores the changes into non-volatile storage (NVS).

**CE Disp Sensors Menu:** Figure 159 shows the Disp Sensors menu. This menu allows the CE to view the state of the library and drive sensors, and to change the states dynamically. A delay of approximately one second is required between sensor state changes.

*Figure 159. Disp Sensors*

Function	Next Menu
CANCEL	Figure 157 on page PANEL-47
CI:1 UB:1	Display Loader cartridge inserted, Unload button sensor states
CT:0000	Cartridge type sensor states
LH:0 FP:0	Display Loader home, File protect sensor states
DO:1 CCP:0	Display Library door open, Clean cartridge present sensor states
M1P:0 M2P:0	Display magazine 1 and 2 present sensor states
GIA:0 GIB:0	Display Global interference A and B sensor states
PS:1 CP:1	Display Priority slot, Cartridge present sensor states
P1:1 P2:0	Display Picker pinch 1 and 2 sensor states
L1:1 L2:0	Display Picker limit 1 and 2 sensor states

**Note:** The values shown for each sensor will vary on your machine depending upon whether a cartridge is loaded and other variables. For information on how to change states on each sensor, see “Library Sensors Checkout Procedure” on page PROC-18.

**CE Disp/Alt VPD Menu:** Figure 160 shows the Disp/Alt VPD menu.

This menu allows the CE to select the vital product data (VPD) group that contains the specific VPD field to be displayed or altered. All groups listed below may be displayed, but only some groups that are contained in the **Flash Grp** may be altered with this menu. Changes are not saved to non-volatile storage (Flash EEPROM) until the CANCEL option in the Disp/Alt VPD menu is selected.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 160. Disp/Alt VPD</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
UCODE GRP	Figure 161 on page PANEL-51
HEAD GRP	Figure 161 on page PANEL-51
PROCESSOR GRP	Figure 161 on page PANEL-51
DRAM GRP	Figure 161 on page PANEL-51
FLASH GRP	Figure 161 on page PANEL-51

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Ucode Grp** The link level and size of the microcode.

**Head Grp** The initial position sensor (IPS) gain settings, plant of manufacture, and serial number of the read/write head.

**Processor Grp** The type of processor in the card pack.

**Dram Grp** The EC levels of the module. These fields are only maintained in DRAM, not in flash EEPROM or in the microcode.

**Flash Grp** The SCSI addresses, the LIBR mode, and the other setup choices you can make from the operator/CE panel (the dynamic information). This information is in flash EEPROM.

**CE Group Name Menu:** Figure 161 shows the Group Name menu. This menu allows the CE to select a VPD field to display or alter.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 161. Group Name</i>	
Function	Next Menu
CANCEL	Figure 160 on page PANEL-50
<VPD field i>	Figure 162 or Figure 163 on page PANEL-52
<VPD field i+1>	Figure 162 or Figure 163 on page PANEL-52
...	Figure 162 or Figure 163 on page PANEL-52
<VPD field i+n>	Figure 162 or Figure 163 on page PANEL-52

**Cancel** Causes the Figure 160 on page PANEL-50 to appear.

**VPD field** Causes the selected VPD field to appear. If the VPD field selected is large, the VPD Field Offset menu is displayed. Otherwise, the VPD data menu is displayed.

**CE VPD Field Offset Menu:** Figure 162 shows the VPD Field Offset menu. This menu selects the number of bytes to skip (bytes to not display) in the VPD field chosen at Figure 161.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 162. VPD Field Offset</i>	
Function	Next Menu
CANCEL	Figure 161
OFFSET VALUE	—
000 30	Figure 163 on page PANEL-52
001 30	Figure 163 on page PANEL-52
002 4B	Figure 163 on page PANEL-52
....	Figure 163 on page PANEL-52

**Cancel** Causes the Figure 161 to appear.

**<number>** Allows the CE to select an offset in the VPD field. After you select a number, Figure 163 on page PANEL-52 is displayed.

The message **Field Protected** is informing the CE that the VPD field just selected is displayed, but cannot be modified.

**CE VPD Data Menu:** Figure 163 shows the VPD Data menu. This menu allows the CE to modify any character in the selected offset for the selected VPD field.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 163. VPD Data</i>	
Function	Next Menu
CANCEL	Figure 162 on page PANEL-51 or Figure 161 on page PANEL-51
<VPD offset high nibble>	—
<VPD offset next nibble>	—
<VPD offset next nibble>	—
<VPD offset low nibble>	—
SAVE AND CONTINUE	Figure 164

**Cancel** Causes the Figure 162 on page PANEL-51 to appear if an offset is required. If offset is not required, Figure 161 on page PANEL-51 appears. Any changes to VPD Data are **not** saved.

**<VPD nibble>** Shows the data (hex number) contained in the selected VPD field for the offset selected. The CE can select another value for that nibble.

**Save and Continue** Causes the Figure 164 to appear. This option is invalid if the VPD field is protected.

**CE Verify Data Menu:** Figure 164 shows the Verify Data menu. This menu allows the CE to check and verify the VPD entered before the data is stored in nonvolatile storage.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 164. Verify Data</i>	
Function	Next Menu
CANCEL	Figure 157 on page PANEL-47
YES	Figure 157 on page PANEL-47
NO	Figure 163

**Cancel** Causes the Figure 157 on page PANEL-47 to appear. The VPD data is not modified.

**Yes** Causes the verified data to be stored in nonvolatile storage, then causes Figure 157 on page PANEL-47 to appear.

**No** Causes the Figure 163 to appear. The VPD data is not modified.



**CE Control Store Select Address Menu:** Figure 165 shows the Control Store Select Address menu.

**Note:** This menu is applicable to drive 1 only.

This menu allows the CE to select an address in control store. The byte is read from the selected address. The message line indicates that the control store option was selected on the previous screen.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 165. Control Store Select Address</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
CS ADR (8 characters displayed vertically)	—
CONTINUE	Figure 166 on page PANEL-54

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**<CS ADR>** Defines the address to be chosen. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Continue** Takes the address displayed and goes to Figure 166 on page PANEL-54.

**CE Control Store Display Menu:** Figure 166 shows the Control Store Display menu. This menu allows the CE to display the byte in the specified address. The message line indicates the current control store address and value.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 166. Control Store Display</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
SCROLL UP	—
<CS Adr+0> <CS Data>	—
<CS Adr+4> <CS Data>	—
<CS Adr+8> <CS Data>	—
<CS Adr+...> <CS Data>	—
SCROLL DOWN	—

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Scroll Up** Causes previous addresses to be displayed (scrolling up through memory).

**<CS Adr> <data>** Shows the data contained in the word starting at the specified address and causes the Figure 165 on page PANEL-53 to appear.

**Scroll Down** Causes the next address to be displayed (scrolling down through memory).

**CE Microcode Trap Menu:** Figure 167 shows the Microcode Trap menu. This menu allows the CE to set a specific trap in microcode to force a microcode dump.

This menu is applicable to drive 1 only.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 167. Ucode Trap</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
TRAP (4 characters displayed vertically)	—
ADD FSC TRAP	—
REMOVE FSC TRAP	—
LIST FSC TRAPS	Figure 182 on page PANEL-68
SAVED TRAP	Figure 179 on page PANEL-66

**Cancel** Causes the Figure 157 on page PANEL-47 to appear. The address is not saved.

**Trap** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Add FSC Trap** Allows the CE to add an FSC trap.

**Remove FSC Trap** Allows the CE to remove an FSC trap.

**List FSC Traps** Causes all FSC traps to be displayed in Figure 182 on page PANEL-68.

**Saved Trap** Causes the Figure 179 on page PANEL-66 to appear.

**CE Read Tape Menu:** Figure 168 shows the Read Tape menu. This menu allows the CE to select portions of the tape to be displayed on the operator panel display.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 168. CE Read Tape</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
SHOW SARS VOLSER	—
PROCESS LOADED TAPE	Figure 169 on page PANEL-57
UNLOAD DRIVE	—
LOAD FROM PRIO SLOT	—

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Show SARS Volser** Displays SARS Volser

**Process Loaded Tape** Allows CE to move and read tape.

**Unload Drive** Allows the CE to unload the cartridge from the Drive.

**Load from prio slot** Enables the library to load a tape from the priority slot.

**CE Process Tape Menu:** Figure 169 shows the Process Tape menu. This menu allows the CE to select portions of the tape to be displayed on the operator panel display.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 169. CE Process Tape</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
SPACE	Figure 170 on page PANEL-58
LOCATE	—
READ BLOCK	Figure 171 on page PANEL-59
NEXT BLOCK ID	Figure 172 on page PANEL-59

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Space** Allows CE to move to different parts of tape.

**Locate** Allows the CE to locate to any block on the tape.

**Read Block** Allows the CE to read data or header info from tape.

**Next Block ID** Displays the next block ID on tape.

**Space Menu:** Figure 170 shows the Space menu. This menu allows the CE to select portions of the tape to be displayed on the operator panel display.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 170. Space Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
SPACE FRWD BLK	number of blocks
SPACE BKWD BLK	number of blocks
SPACE FRWD FILE	number of files
SPACE BKWD FILE	number of files
SPACE EOD	—

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**Space FRWD BLK** Allows CE to space forward on tape the number of blocks specified.

**Space BKWD BLK** Allows the CE to space backwards on tape the number of blocks specified.

**Space FRWD File** Allows CE to space forward on tape the number of files specified.

**Space BKWD File** Allows the CE to space backwards on tape the number of files specified.

**Space EOD** Allows the CE to space to the end of data.

**Read Block Menu:** Figure 171 shows the Read Block Menu. This menu allows the CE to do a read block command.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 171. Read Block Menu</i>	
Function	Next Menu
READ BLK DATA	—
READ BLK HDR	—

**Read BLK Data** Displays the first 80 characters of blocks data. At bottom of menu you can go to next 80 character and up to 16K.

**Read BLK HDR** Displays the first 80 characters of blocks header. By scrolling down you can display the next 16 characters.

**Next Block ID Menu:** Figure 172 shows the Next Block ID Menu This menu allows the CE to show the next block id.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 172. Next Block ID Menu</i>	
Function	Next Menu
NEXT BLOCK ID :xxxxxxx	—

**Next Block ID** Displays the next blocks ID.

**Password Menu:** Figure 173 shows the Password menu. This menu is displayed when Engr Use Only is chosen from the Figure 157 on page PANEL-47. If the correct password is entered, the Figure 174 on page PANEL-61 appears.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 173. Enter Password</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 157 on page PANEL-47
A...	Figure 174 on page PANEL-61
Z...	Figure 174 on page PANEL-61
0...	Figure 174 on page PANEL-61
9	Figure 174 on page PANEL-61

**Cancel** Causes the Figure 157 on page PANEL-47 to appear.

**<character>** Indicates the current character to be entered into the password. When this option is chosen, the character selected is entered into the password and displayed in the message area. After the last letter is entered and the password is correct, the Figure 174 on page PANEL-61 is displayed. If the password is not correct, Figure 157 on page PANEL-47 is displayed.

The message area indicates that a password is being entered. Every character entered in the password field is displayed in the message area.



**Engr Use Only Menu:** Figure 174 shows the Engr Use Only menu. This menu allows product engineers and design engineers, after entering the password, to access the menu items.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 174. Engr Use Only Menu</i>	
Function	Next Menu
CANCEL	Figure 157 on page PANEL-47
CONTROL STORE ...	Figure 177 on page PANEL-65
MEDIA TEST MODE	Figure 173 on page PANEL-60
ALLOW ALTER PVPD	—
TEST HEAD	—
TEST TAPE	—

- Cancel** Causes the Figure 157 on page PANEL-47 to appear.
- Control Store** Allows a product engineer (PE) to read and write any address in nonvolatile store and in control store DRAM.  
**Attention:** The message area warns that damage can occur to the machine. The machine can be configured improperly and made inoperable with this option.
- Media Test Mode** Causes the password menu to appear. After you enter the password in Figure 173 on page PANEL-60, Figure 175 on page PANEL-62 allows you to set media mode.
- Allow Alter PVPD** Allows a product engineer (PEP) to alter any Flash Group VPD field.
- Test Head** Causes extended test of head, head cables and associated circuitry. Test will run for a minimum of three minutes.**ATTENTION: A known good scratch tape must be loaded before starting the test.**
- Test Tape** Test will run an extended test of the tape and will execute for a minimum of five minutes.**ATTENTION: This test assumes that the drive hardware is in good working condition. The tape to be tested must be loaded before starting the test.**

**Media Mode Menu:** Figure 175 shows the Media Mode menu. This menu allows product engineers and design engineers, after entering the password, to access the menu items.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 175. Media Mode Menu</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 174 on page PANEL-61
MEDIA MODE OFF/ON	—
NORM/SHRT CLEN CYCLE	—
ALLOW/PREV EXP TAPE	—

**Cancel** Causes the Figure 174 on page PANEL-61 to appear.

**Media Mode Off/On** Allows a product engineer (PE) to set Media Mode Off or On.

**Norm/Shrt Clen Cycle** Allows a product engineer (PE) to set the cleaning cycle to normal or short duration.

**Allow/Prevent Exp Tape** Allows a product engineer (PE) to allow or prevent Exp Tape

The default is *off*. When this option is set to **on**, the drive is placed in a special mode to test the media. Any media written in this mode can only be read by a device in media mode.

If the device reading the media is not in media mode, the cartridge appears as a scratch.

**Statistics Menu:** Figure 176 shows part of the Statistics menu.

**Note:** Statistics are valid only if the *Save* option is selected in Figure 118 on page PANEL-18.

<i>Figure 176. Statistics</i>	
Function	Next Menu
CANCEL	Figure 157 on page PANEL-47
See below for complete list	Figure 176

**Note:** The statistic values are displayed in decimal.

All functions are from the library *transport*. For example, **Put Mag Fail** is a failure when the cartridge is moved from the *transport* to the magazine.

<b>Cancel</b>	Causes the Figure 118 on page PANEL-18 to appear.
<b>Mounts to Drv</b>	The total number of times a cartridge was mounted in the drive.
<b>Priority Mnts</b>	The total number of times a cartridge was mounted from the priority cell.
<b>Magazine Mnts</b>	The total number of times a cartridge was mounted from any of the cells of the magazine.
<b>Clean Mounts</b>	The total number of times a cartridge was moved from the cleaning cartridge slot to the tape drive.
<b>Pwr On Hrs</b>	The total number of hours the device was powered on.
<b>Library Errors</b>	The total number of errors that occurred on Library operations.
<b>Put Drive Fail</b>	The total number of errors that occurred when a cartridge was inserted in the drive.
<b>Get Drive Fail</b>	The total number of errors that occurred when a cartridge was being removed from the drive.
<b>Pinch Mtr Err</b>	The total number of timeouts on the motor.
<b>Feed Mtr Error</b>	The total number of timeouts on the motor.
<b>Cell to Cell</b>	The total number of times cartridges were moved to or from any cells or to or from the drive.
<b>Recalibrations</b>	The total number of times the transport had to be recalibrated.
<b>Put Mag Fail</b>	The total number of errors that occurred when a cartridge was inserted in the magazine.
<b>Get Mag Fail</b>	The total number of errors that occurred when a cartridge was being taken from the magazine.
<b>Put Pri Fail</b>	The total number of errors that occurred when a cartridge was being inserted in the priority cell.
<b>Get Pri Fail</b>	The total number of errors that occurred when a cartridge was being retrieved from the priority cell.
<b>Get Mag Retry</b>	The total number of errors that required a retry operation when a cartridge was being retrieved from a magazine or priority cell (from the front of the Library).

**Put Mag Retry**

The total number of errors that required a retry operation when a cartridge was being put into the magazine or priority cell (from the front of the library).

**Get Dri Retry**

The total number of errors that required a retry operation when a cartridge was being retrieved from the drive.

**Put Dri Retry**

The total number of errors that required a retry operation when a cartridge was being put into the drive.

**Control Store Select Address Menu:** Figure 177 shows the Control Store Select Address menu. This menu allows the CE to select an address in control store. Data is written into the selected address. The message line indicates that the Control Store option was chosen on the previous screen.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 177. Select Address</i>	
Function	Next Menu
CANCEL	Figure 174 on page PANEL-61
CS ADR (8 characters displayed vertically)	—
CONTINUE	Figure 178

**Cancel** Causes the Figure 174 on page PANEL-61 to appear.

**CS Adr** Defines the hex address to be chosen. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Continue** Takes the address displayed and goes to Figure 178.

**Control Store Alter Menu:** Figure 178 shows the Control Store Alter menu. This menu allows a PE to display the byte in the specified address and to update the data in that address. The message lines indicate the control store address selected and indicates the value at that address.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 178. Display/Alter</i>	
Function	Next Menu
CANCEL	Figure 177
<CS Addrss> <CS Data>	—
<CS hi nibble>	—
<CS low nibble>	—
SAVE AND RETURN	Figure 177
<b>Note:</b> Enter CS Addr CS Val: <CS Data>	

**Cancel** Causes the Figure 177 to appear. Any modifications to the byte are canceled.

**<address> <data>** Shows the data contained in the word (4 bytes) selected. This display cannot be selected and is for information purposes only.

**<CS nibble>** Shows the current nibble (hex number) in the byte selected. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Save and Return** Saves the updated byte in the address and returns to the Figure 177.

**CE Saved Traps Menu:** Figure 179 shows the Saved Traps menu.

This menu allows the CE to add, remove or list **saved** FSC traps.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 179. Saved Traps</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 167 on page PANEL-55
TRAP (4 characters displayed vertically)	—
ADD SAVED FSC TRAP	—
RMV SAVED FSC TRAPS	—
LIST SAVED FSC TRAPS	Figure 180 on page PANEL-67

**Cancel** Causes the Figure 167 on page PANEL-55 to appear. The address is not saved.

**Trap** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Add Saved FSC Trap** Allows the CE to add a Saved FSC trap.

**Rmv Saved FSC Traps** Allows the CE to remove a Saved FSC trap.

**List Saved FSC Traps** Causes the Figure 180 on page PANEL-67 to be displayed.

**CE Saved FSC Trap List Menu:** Figure 180 shows the Saved FSC Trap List menu.

This menu allows the CE to select a saved FSC to be removed from a list of **saved** FSC traps.

**Note:** This menu is normally used because of specific requests from support personnel.

*Figure 180. Saved FSC Trap List*

Function	Next Menu
CANCEL	Figure 179 on page PANEL-66
SAVED FSC1	Figure 181 on page PANEL-68
SAVED FSC2	Figure 181 on page PANEL-68
SAVED FSC3	Figure 181 on page PANEL-68

**Cancel** Causes the Figure 179 on page PANEL-66 to appear.

**Saved FSC1** Selecting this FSC will cause Figure 181 on page PANEL-68 to be displayed. If no saved trap exists, then "SLOT EMPTY" will be displayed.

**Saved FSC2** Selecting this FSC will cause Figure 181 on page PANEL-68 to be displayed. If no saved trap exists, then "SLOT EMPTY" will be displayed.

**Saved FSC3** Selecting this FSC will cause Figure 181 on page PANEL-68 to be displayed. If no saved trap exists, then "SLOT EMPTY" will be displayed.

**Note:** Only **three saved** traps can be active at a time.

**CE Remove Saved FSC Trap Menu:** Figure 181 shows the Remove Saved FSC Trap menu.

This menu allows the CE to remove a **saved** FSC trap which was selected in Figure 180 on page PANEL-67.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 181. Remove Saved FSC Trap</i>	
Function	Next Menu
CANCEL	Figure 179 on page PANEL-66
TRAP (4 characters displayed vertically)	—
RMV SAVED FSC TRAP	—

**Cancel** Causes the Figure 179 on page PANEL-66 to appear.

**Trap** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Rmv Saved FSC Trap** Allows the CE to remove the Saved FSC trap which was selected in the previous menu Figure 180 on page PANEL-67.

**CE FSC Trap List Menu:** Figure 182 shows the FSC Trap List menu.

This menu allows the CE to select a (normal) FSC to be removed from a list of (normal) FSC traps.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 182. FSC Trap List</i>	
Function	Next Menu
CANCEL	Figure 167 on page PANEL-55
FSC1 (normal trap)	Figure 183 on page PANEL-69
FSC2 (normal trap)	Figure 183 on page PANEL-69
.... (normal trap)	Figure 183 on page PANEL-69

**Cancel** Causes the Figure 167 on page PANEL-55 to appear.

**FSC1** Selecting this FSC will cause Figure 183 on page PANEL-69 to be displayed.

**FSC2** Selecting this FSC will cause Figure 183 on page PANEL-69 to be displayed.

**....** Selecting this FSC will cause Figure 183 on page PANEL-69 to be displayed.

**Note:** If no traps exist, then “NO TRAPS SET” is displayed.

**Note:** More than three (normal) FSCs may be displayed on this menu.



**CE Remove FSC Trap Menu:** Figure 183 shows the Remove FSC Trap menu.

This menu allows the CE to remove a (normal) FSC trap which was selected in Figure 182 on page PANEL-68.

**Note:** This menu is normally used because of specific requests from support personnel.

<i>Figure 183. Remove FSC Trap</i>	
<b>Function</b>	<b>Next Menu</b>
CANCEL	Figure 167 on page PANEL-55
TRAP (4 characters displayed vertically)	—
REMOVE FSC TRAP	—

**Cancel** Causes the Figure 167 on page PANEL-55 to appear.

**Trap** Allows the CE to select a specific hex value. To change the value of the nibble, select the nibble, which causes another menu to appear where you can select 0–F.

**Remove FSC Trap** Allows the CE to remove the (normal) FSC trap which was selected in the previous menu Figure 182 on page PANEL-68.



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# Inspection

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## General Instructions

Use this checklist to ensure that a machine not covered by an IBM Maintenance Agreement has the necessary safety items installed and no other changes were made that would make it unsafe or inoperable. Each machine, as it was designed and assembled, had needed safety items installed to protect the owners, operators, and service personnel from injury.

**Note:** This equipment is designed for connection to IT (impedance transformer) power subsystems.

## Materials Needed

The following items are needed or are useful during the inspection:

- Copies of safety service memorandums (SMs) and engineering change announcements (ECAs) for this machine type

- Machine history

- Electrical Safety for IBM Customer Engineers, S229-8124*

## Education

Service personnel must be trained on the new general maintenance agreement qualification (MAQ), tailored-maintenance agreement qualification, and changed machine safety inspection procedures as part of the electrical safety course.

---

## Safety

The general caution symbol  identifies conditions where caution must be used.

The electrical caution symbol  identifies electrical hazards where extreme caution must be used.

Perform this inspection before the normal inspection for a maintenance agreement. **Suspect that the 3570 is unsafe until you verify that it is safe.** If any unsafe conditions are present, decide how serious the hazard is and whether you can continue without first correcting the problem. Possible safety hazards are:

**Electrical** An electrically charged frame can cause serious or lethal electrical shock.

**Mechanical** Hazards, such as a safety cover missing, are potentially harmful to people.

**Chemical** Do not use solvents, cleaners, or other chemicals not approved for use on this product.

Any of the problems listed above must be repaired before you use the 3570.

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

**C1**

**CAUTION:**

The 3570 Model B01 weighs approximately 35 kilograms (77 pounds); it takes three persons to safely lift this unit.

**C2**

**CAUTION:**

The 3570 Model B11 and B21 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.

**C3**

**CAUTION:**

The 3570 Model B02 weighs approximately 40 kilograms (88 pounds); it takes three persons to safely lift this unit.

**C4**

**CAUTION:**

The 3570 Model B12 and B22 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.

**C5**

**CAUTION:**

When you are sliding the 3570 Drive tray assembly in or out, make sure you do not get your hand caught between the drive and the rack. Also, when you are servicing the 3570, make sure the slide and tray assembly is fully extended and locked.

## Safety Inspection Procedures

Before performing the safety procedures, ensure the existing room and electrical conditions are safe.

See Device Covers and Serial Number and Label Locations for locations. Perform the following steps:

1. Power off the 3570.
2. Disconnect the channel cables.
3. See Figure 184. Disconnect the power cord 1 from its source.
4. Check that no voltage exists between the housing on the power source and building ground.
5. Check that resistance is less than 0.1 ohm from the building ground to the power supply enclosure 3 .
6. Inspect the power cable 1 for visible cracks, wear, or damage.
7. Check that the resistance between the power cable ground and the 3570 frame 2 is less than 0.1 ohm.
8. Inspect the enclosure covers 3 to ensure all screws are installed and tight.

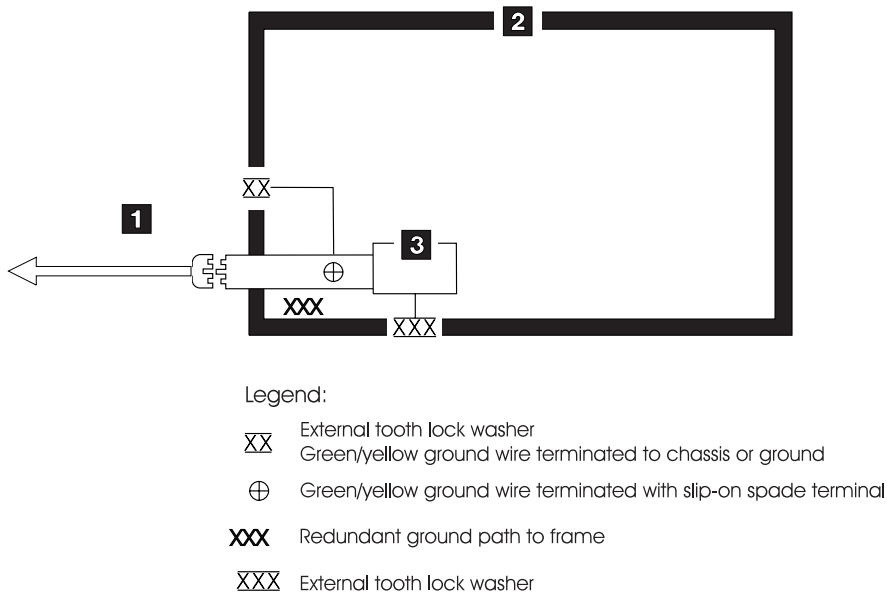



Figure 184. AC Grounding Diagram (50 Hz and 60 Hz)

## Sécurité

Le symbole attention  indique qu'une attention particulière est nécessaire.

Le symbole risque électrique  identifie des risques liés au courant électrique ; il faut en ce cas faire preuve d'une extrême prudence.

Ces procédures doivent être effectuées avant l'inspection normale pour un contrat de maintenance. **Le sous-système de bande magnétique IBM 3570 doit être considéré comme potentiellement dangereux tant qu'il n'a pas été vérifié.** Si vous détectez la moindre condition d'insécurité, vous devez évaluer sa gravité et déterminer si vous pouvez continuer ou non sans avoir d'abord corrigé le problème. Les risques peuvent être de différentes natures :

<b>Risques électriques</b>	Un châssis chargé en électricité peut provoquer un choc électrique grave ou mortel.
<b>Risques mécaniques</b>	L'absence d'un carter de sécurité, par exemple, peut être à l'origine de blessures.
<b>Risques chimiques</b>	Utilisez uniquement les produits de nettoyage et autres produits chimiques recommandés pour ce matériel.

Assurez-vous que toutes ces conditions de sécurité sont remplies avant d'utiliser le sous-système de bande magnétique IBM 3570.

Chaque consigne est introduite par un identificateur (Attention=Cn).

### C1

#### ATTENTION

Le sous-système 3570 modèle B01 pèse 35 kilogrammes. La présence de 3 personnes est nécessaire pour le soulever.

### C2

#### ATTENTION

Le sous-système 3570 modèle B11 pèse 24 kilogrammes. La présence de deux personnes est nécessaire pour le soulever.

### C3

#### ATTENTION

Le sous-système 3570 modèle B02 pèse 40 kilogrammes. La présence de 3 personnes est nécessaire pour le soulever.

### C4

#### ATTENTION

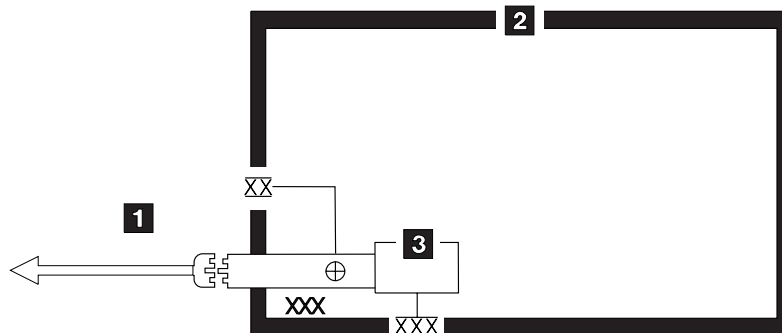
Le sous-système 3570 modèle B12 pèse 29 kilogrammes. La présence de deux personnes est nécessaire pour le soulever.

## Inspection de sécurité

Avant de procéder à l'inspection de sécurité, assurez-vous que la salle ainsi que l'installation électrique remplissent toutes les conditions de sécurité.

Pour plus de détails sur les emplacements des éléments, reportez-vous aux sections "Device Covers" et "Labels." Effectuez les opérations ci-dessous.

1. Mettez le sous-système 3570 hors tension.
2. Débranchez les cordons de transmission.
3. Reportez-vous à la Figure 185. Débranchez le cordon d'alimentation 1 du socle de prise de courant.
4. Assurez-vous que la tension est nulle entre le boîtier de la source d'alimentation et la terre du bâtiment.
5. Vérifiez que la résistance est inférieure à 0,1 ohm entre la terre du bâtiment et le carter du sous-système 2.
6. Examinez le cordon d'alimentation 1 et assurez-vous qu'il n'est ni craquelé, ni troué, ni endommagé.
7. Vérifiez que la résistance entre la broche de terre du cordon d'alimentation et le sous-système 3570 est inférieure à 0,1 ohm.
8. Examinez les capots 3 et assurez-vous que les vis sont correctement placées et serrées



Légendes :

- XX Rondelle frein dentelée externe
- XX Fil de terre vert/jaune aboutissant au châssis ou à la terre
- ⊕ Fil de terre vert/jaune muni d'une cosse plate
- XXX Chemin de mise à la terre redondant vers le châssis
- XXX Rondelle frein dentelée externe

Figure 185. Schéma de mise à la terre c.a. (50/60 Hz)



## 안전



일반 주의사항 기호는 주의를 요하는 조건들을 나타냅니다.



전기적 주의사항 기호는 극도의 주의를 요하는 전기적 위험들을 나타냅니다.

유지보수 일치에 대한 일반 검사를 수행하기 전에 이 검사를 수행하십시오. 안전을 확인할 때까지 **3570**의 안전성을 의심하십시오. 안전하지 않은 조건들이 존재할 경우, 그 위험 요소의 심각성 정도와 이러한 문제를 정정하지 않고 작업을 계속할 수 있는지의 여부를 결정하십시오. 안전 저해 요인으로는 다음을 들 수 있습니다:

### 전기적

충전 프레임은 심각하거나 치명적인 감전 사고를 초래할 수 있습니다.

### 기계적

안전 커버 등이 없을 경우, 사람들에게 위험을 가할 수 있습니다.

### 화학적

이 제품용으로 승인되지 않은 솔벤트, 클리너 또는 기타 화학품들을 사용하지 마십시오.

여기에 열거된 문제점들을 반드시 해결한 다음, **3570**을 사용하십시오.

다음 주의사항은 C1(주의사항 1)과 C2(주의사항 2)로 되어있습니다.

### C1

#### 주의사항

**3570** 모델 **B01**의 무게는 약 35 킬로그램(77 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.

### C2

#### 주의사항

**3570** 모델 **B11**의 무게는 약 24 킬로그램(53 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.

### C3

#### 주의사항

**3570** 모델 **B02**의 무게는 약 40 킬로그램(88 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.


### C4


#### 주의사항

**3570** 모델 **B12**의 무게는 약 29 킬로그램(64 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.

---

안전

 일반 주의사항 기호는 주의를 요하는 조건들을 나타냅니다.

 전기적 주의사항 기호는 극도의 주의를 요하는 전기적 위험들을 나타냅니다.

유지보수 일치에 대한 일반 검사를 수행하기 전에 이 검사를 수행하십시오. 안전을 확인할 때까지 **3570**의 안전성을 의심하십시오. 안전하지 않은 조건들이 존재할 경우, 그 위험 요소의 심각성 정도와 이러한 문제를 정정하지 않고 작업을 계속할 수 있는지의 여부를 결정하십시오. 안전 저해 요인으로는 다음을 들 수 있습니다:

전기적

충전 프레임은 심각하거나 치명적인 감전 사고를 초래할 수 있습니다.

기계적

안전 커버 등이 없을 경우, 사람들에게 위험을 가할 수 있습니다.

화학적

이 제품용으로 승인되지 않은 솔벤트, 클리너 또는 기타 화학품들을 사용하지 마십시오.

여기에 열거된 문제점들을 반드시 해결한 다음, **3570**을 사용하십시오.

다음 주의사항은 C1(주의사항 1)과 C2(주의사항 2)로 되어 있습니다.

C1

주의사항

**3570** 모델 **B01**의 무게는 약 **40** 킬로그램(**88** 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.


C2

주의사항

**3570** 모델 **B11**의 무게는 약 **24** 킬로그램(**53** 파운드)입니다. 이 장치를 안전하게 옮기기 위해서는 두 사람이 필요합니다.

## Seguridad

El símbolo general de precaución  identifica situaciones en las que debe tener precaución.

El símbolo de precaución eléctrica  identifica situaciones de riesgo eléctrico en las que debe extremar la precaución.

Realice esta inspección antes de la inspección normal para un acuerdo de mantenimiento. **Considere que la 3570 no es segura hasta verificar que lo es.** Si detecta alguna condición poco segura, decida el grado de riesgo existente y si puede continuar sin solucionar primero el problema. Posibles condiciones de riesgo para su seguridad son,

- |                           |  |
|---------------------------|--|
| <b>Riesgos eléctricos</b> | Un bastidor cargado eléctricamente puede producir descargas serias o letales.  |
| <b>Riesgos mecánicos</b>  | Riesgos, como la falta de la cubierta de seguridad, son potencialmente perjudiciales para la gente.                                |
| <b>Riesgos químicos</b>   | No use disolventes, artículos de limpieza u otros productos químicos que no hayan sido aprobados para ser usados en este producto. |

Cualquier problema de los listados anteriormente debe ser corregido antes de usar la 3570.

Los avisos siguientes se han traducido en varios idiomas. Cada aviso contiene un identificador (Precaución=Cx).

### C1

#### PRECAUCION

La 3570 modelo 3570 B01 pesa 35 kilogramos (77 libras); se necesitan tres personas para levantar esta unidad sin peligro.

### C2

#### PRECAUCION

La modelo 3570 B11 pesa 24 kilogramos (53 libras); se necesitan dos personas para levantar esta unidad sin peligro.

### C3

#### PRECAUCION

La 3570 modelo 3570 B02 pesa 40 kilogramos (88 libras); se necesitan tres personas para levantar esta unidad sin peligro.

### C4

#### PRECAUCION

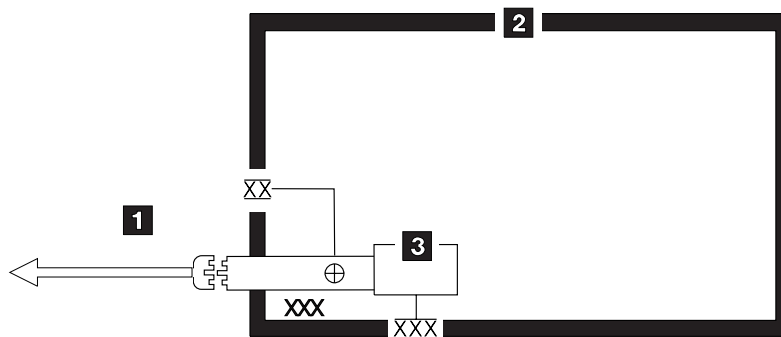
La modelo 3570 B12 pesa 29 kilogramos (64 libras); se necesitan dos personas para levantar esta unidad sin peligro.

## Procedimiento de inspección de seguridad

Antes de proceder con esta inspección, asegúrese de que las condiciones eléctricas y de carácter general existentes son seguras.

Consulte “Cubiertas del dispositivo” (“Device Covers”) y “Etiquetas” (“Labels”) para saber donde se encuentran. Siga los pasos siguientes:

1. Desconecte la 3570.
2. Desconecte los cables de canal.
3. Consulte la Figure 186. Desconecte el cable de alimentación 1 de su fuente de alimentación.
4. Compruebe que no hay voltaje entre el receptáculo de la fuente de alimentación y la toma de tierra del edificio.
5. Compruebe que la resistencia es menor de 0.1 ohmios desde la toma de tierra del edificio hasta el recinto del dispositivo 2 .
6. Inspeccione el cable de alimentación 1 para detectar grietas, desgaste excesivo u otros desperfectos visibles.
7. Compruebe que la resistencia entre la toma de tierra del cable de alimentaci\_n y la 3570 es menor de 0.1 ohmios.
8. Inspeccione las cubiertas del recinto 3 para comprobar que todos los tornillos están instalados y firmes.



Legenda:


- ⊗⊗ Arruela de trava dentada externa
- ⊗⊗ Fio de terra verde/amarelo com terminação para o chassi ou terra
- ⊕ Fio de terra verde/amarelo terminado com terminal slip-on spade
- ⊗⊗⊗ Caminho de terra redundante para a estrutura
- ⊗⊗⊗ Arruela de trava dentada externa


A21M0029

Figure 186. Diagrama de toma de tierra CA (50 Hz y 60 Hz)

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## Segurança

O símbolo geral de cuidado  identifica condições nas quais é necessário cuidado.

O símbolo de cuidado elétrico  identifica riscos elétricos onde é necessário cuidado máximo.

Execute esta inspeção antes da inspeção normal para um contrato de manutenção. **Não acredite na segurança do 3570 até certificar-se de que é seguro.** Se houver qualquer condição insegura, verifique a gravidade do risco e se você pode continuar sem antes corrigir o problema. Os riscos de segurança possíveis são:

- Elétrico** Uma estrutura carregada eletricamente pode causar choque elétrico sério ou letal.
- Mecânico** Riscos, tais como a falta de uma tampa de segurança, são potencialmente prejudiciais para as pessoas.
- Químico** Não utilize solventes, produtos de limpeza ou outros produtos químicos não-aprovados para uso neste produto.

Qualquer um dos problemas acima relacionados deve ser resolvido antes de se iniciar a utilização do 3570.

Os seguintes avisos são traduzidos nos idiomas selecionados. Cada aviso contém um identificador (Cuidado=Cx).

### C1

#### CUIDADO O

3570 Modelo B01 pesa 35 quilos (77 libras); são necessárias 3 pessoas para levantar esta unidade com segurança.

### C2

#### CUIDADO O

3570 Modelo B11 pesa 24 quilos (53 libras); são necessárias duas pessoas para levantar esta unidade com segurança.

### C3

#### CUIDADO O

3570 Modelo B02 pesa 40 quilos (88 libras); são necessárias 3 pessoas para levantar esta unidade com segurança.

### C4

#### CUIDADO O

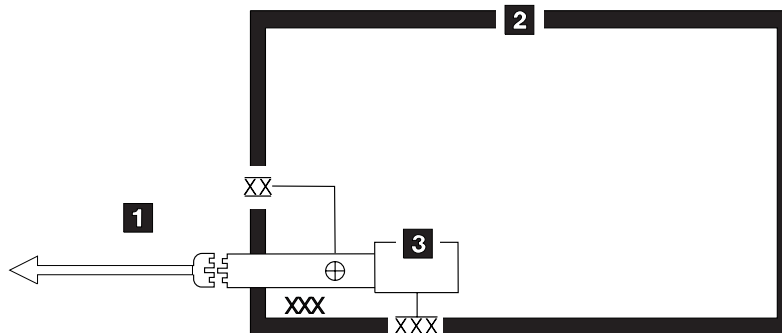
3570 Modelo B12 pesa 29 quilos (64 libras); são necessárias duas pessoas para levantar esta unidade com segurança.

## Procedimentos Para Inspeção de Segurança

Antes de realizar os procedimentos de segurança, certifique-se de que o local e as condições elétricas existentes são seguras.

Consulte “Device Covers” e “Labels” para obter informações sobre localizações. Execute os seguintes passos:

1. Desligue o 3570.
2. Desconecte os cabos de canal.
3. Consulte Figure 187. Desconecte o cabo de alimentação 1 da sua fonte.
4. Confirme se não existe voltagem entre o compartimento na fonte de alimentação e o terra do prédio.
5. Confirme se a resistência é menor do que 0,1 ohm entre o terra do prédio e o compartimento do dispositivo 2.
6. Inspeccione o cabo de alimentação 1 para verificar se existem fissuras, desgastes ou danos.
7. Confirme se a resistência entre o terra do cabo de alimentação e o 3570 é menor do que 0,1 ohm.
8. Inspeccione as tampas dos compartimentos 3 para certificar-se de que todos os parafusos estão instalados e apertados.



Explicación:

- XX Arandela de seguridad dentada externa. Cable de tierra verde/amarillo que acaba en chasis o toma de tierra.
- ⊕ Cable de tierra que acaba en terminal de horquilla deslizable
- XXX Paso redundante de toma de tierra a bastidor
- XXX Arandela de seguridad dentada externa

Figure 187. Diagrama de Aterramento AC (50 Hz e 60 Hz)

---

## Device Covers

Ensure that the external parts of the device are not damaged and do not have sharp edges.

---

## Support Rails—Rack-Mounted Drives

See Figure 188, and Figure 189 on page INSP-14.

1. Ensure that the supporting rails are not damaged and do not have sharp edges.
2. Ensure that the rear bracket-mounting screws, item 1 and rear mounting brackets, item 2 are in place and are tight.
3. Ensure that the front and rear drive-mounting screws are in place and tight.

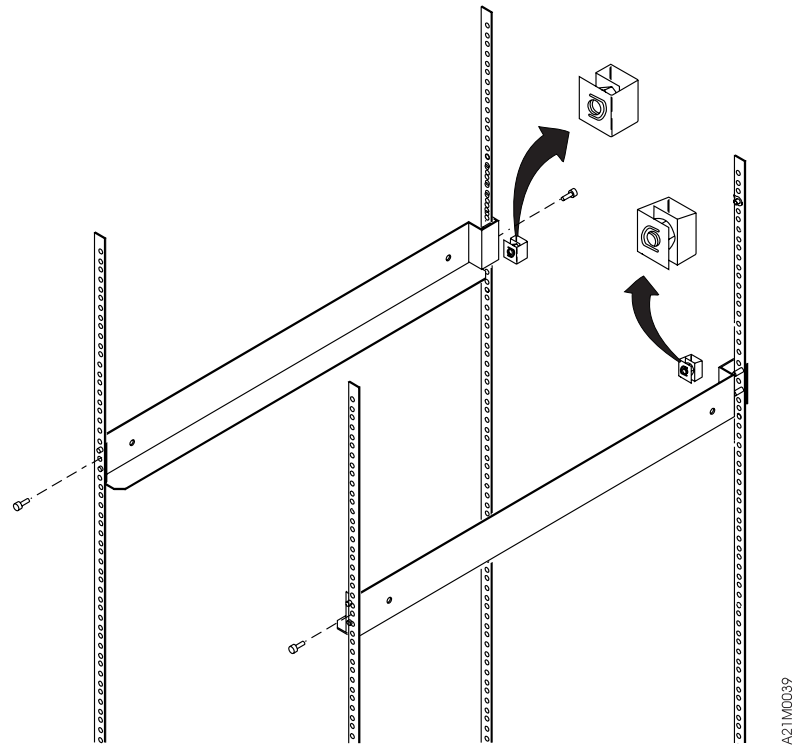
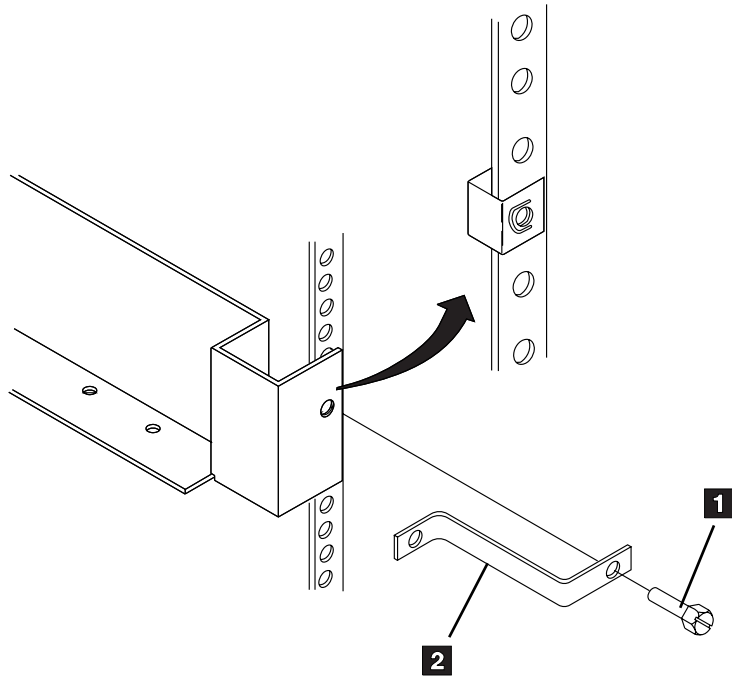


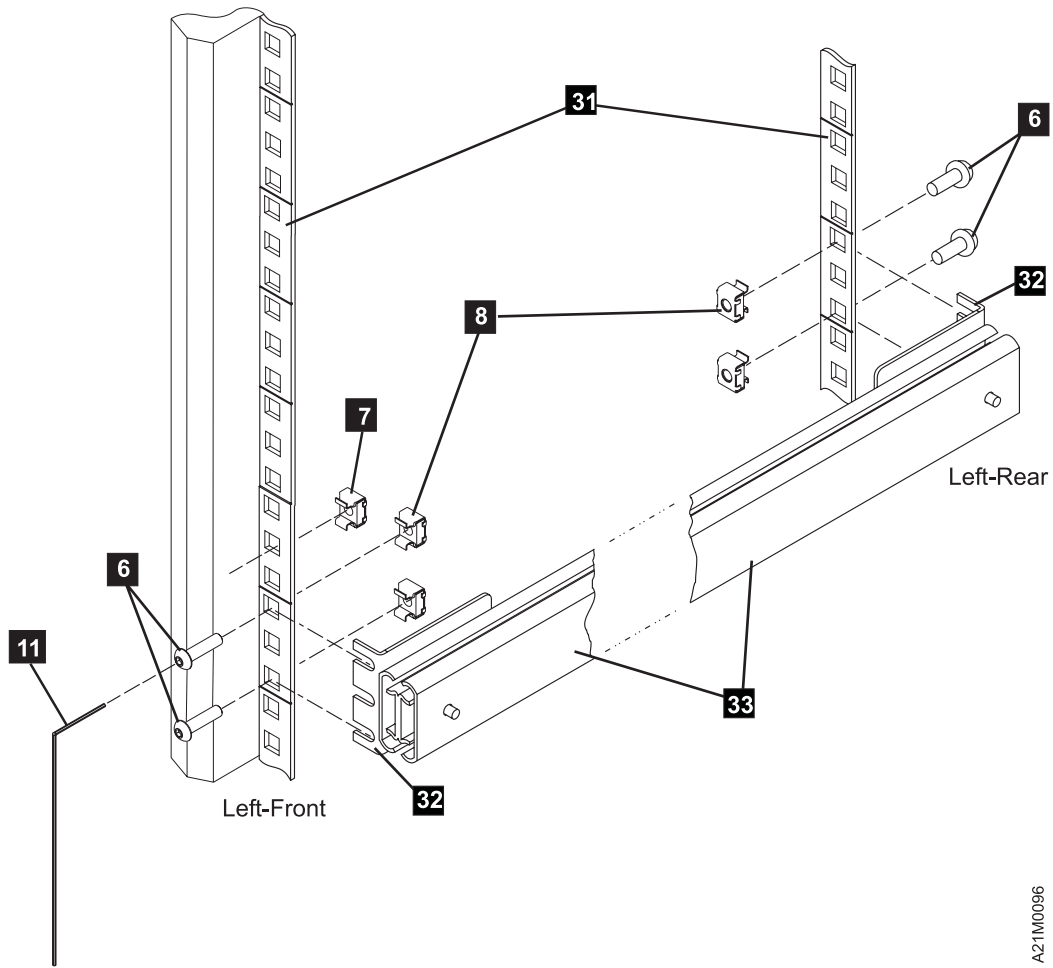
Figure 188. Support Rails Models B11 and B12



A21M0016

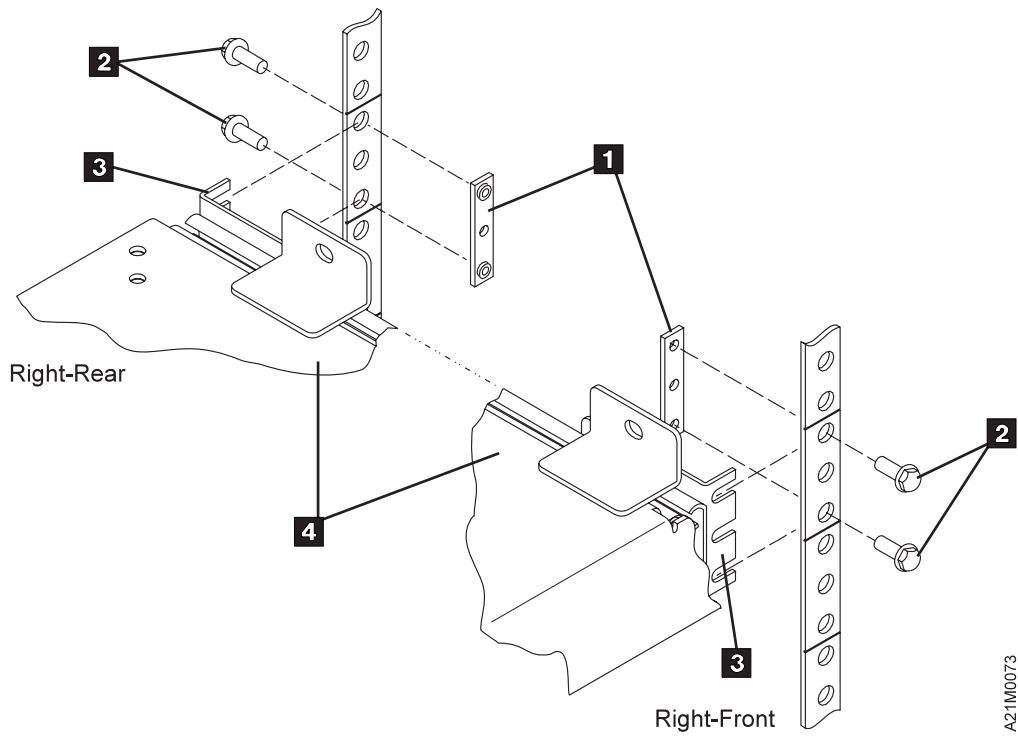
Figure 189. Drive Mounting Brackets—Rear





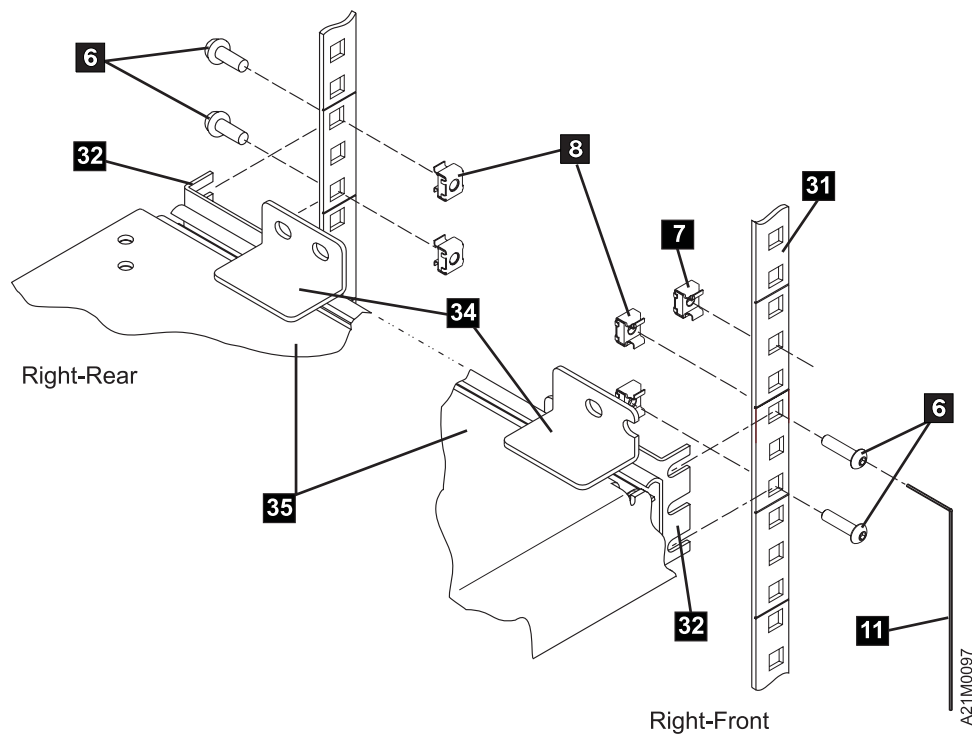
A21M0096

| Figure 190. Support Slide, left side, Models B21 and B22



A21M0073

| Figure 191. Support Slide, right side, Models B11 and B12



A21M0097

| Figure 192. Support Slide, left side, Models B21 and B22

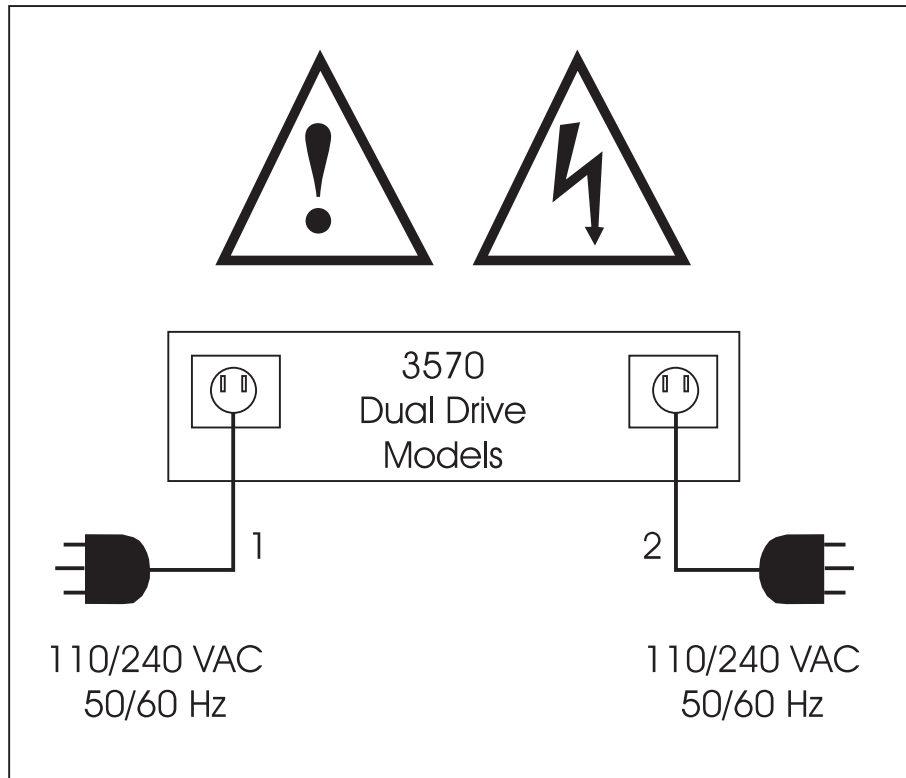


Figure 193. 3570 Model B02/B12 Power Cords

**Note:** Models B02 and B12 use 2 power cords. Disconnect both power cords before servicing the library.

---

## Completion Report

Safety inspection for machine type 3570

General safety inspection

Maintenance agreement qualification (MAQ)

After the inspection, sign, date, and store the checklist with the Maintenance Agreement inspection.

NAME	DATE	SERIAL NUMBER
SAFETY HAZARDS		
LIST ALL SAFETY HAZARDS. IF NONE, SAY NONE.		
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
1 .	_____	_____

This report completes the safety inspection.

1. Reconnect the 3570 power cable(s) into the customer's power receptacle.
2. Reconnect the channel cables to the subsystem.

# Installation

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## Applicable Models

This installation section applies to Library Models B11 and B12, which are rack-mounted and are installed by the CE. It also includes Models B21 and B22 which are rack-mounted and which may be installed by the customer or the CE. The Model B00 is a drive-only device. Library Models B01 and B02 are stand-alone models. All drive-only and stand-alone devices may be installed by the customer or the CE.

**Note:** When the service representative installs Models B00, B01, B02, B21, B22, it is a customer billable call. The customer uses *IBM Magstar MP 3570 Tape Subsystem Operator Guide B-Series Models*, GA32-0345 for installing the 3570.

Read and check off each installation step as it is completed.

---

## Pre-Installation Checks

Check with the IBM branch office or physical planning representative to ensure that installation planning specifications have been met (correct power service outlet or connector, line voltage, grounding, cable lengths, service space and environment).

**Attention:** The 3570 is a precision device that requires careful handling to prevent data loss or permanent damage to the device. Avoid bumping or dropping the 3570.

Open the shipping container and inventory the parts listed on the 3570 bills of material.

**Note:** Save the packaging material for 3570 reshipment or relocation.

Check to make sure that you received the following items:

- \_\_\_ 1. Appropriate power cable(s). Figure 194 on page INST-3 lists all available power cords for the Magstar MP 3570 Tape Subsystem.

**Note:** Two power cables are required for Models B02, B12 and B22.

- \_\_\_ 2. Interposer(s) (if required) for attachment to host:

P/N	Attachment
<b>05H3834</b>	AS/400 with FC 2895
<b>None</b>	AS/400 with FC 2729
<b>None</b>	AS/400 with FC 6534
<b>61G8323</b>	RS/6000 with FC 2891
<b>50G0460</b>	RS/6000 with FC 2892
<b>None</b>	RS/6000 with FC 2409, 6209 or 6207
<b>None</b>	Windows NT based PC
<b>None</b>	HP
<b>None</b>	SUN

- \_\_\_ 3. Cleaning cartridge P/N 05H2463 (give to customer).
- \_\_\_ 4. One or more tape cartridges P/N 05H2462 (give to customer after you run diagnostics).
- \_\_\_ 5. SCSI Terminator P/N 61G8324. Two SCSI terminators are included with Models B02 and B12 and B22.
- \_\_\_ 6. Appropriate SCSI cable. Figure 195 on page INST-4 lists the available SCSI cables for the Magstar MP 3570 Tape Subsystem. One SCSI bus jumper P/N 49G6456 is included with Models B02 and B12. One SCSI bus jumper P/N 05H9527 is included with Models B22 .

- \_\_\_ 7. RS-422 jumper cable, P/N 65F5399 (Model B02, B12 and B22 only). This cable, which connects the two drives in a dual drive model library, may be installed in the Model B02 at the factory, but is usually shipped **uninstalled** in the Model B12 and B22 due to space limits within the packing materials. If not already installed, it will be installed later in these procedures.
- \_\_\_ 8. Pedestal parts (included with Models B01 or B02 only).
- | \_\_\_ 9. Rack mounting hardware (Models B11 and B12 only), slides only no tray. See Figure 203 on  
| page INST-14 for a detailed list.
- | \_\_\_ 10. Rack mounting hardware (Models B11 and B12 only), slides and tray. See Figure 211 on  
| page INST-22 for a detailed list.
- | \_\_\_ 11. Rack mounting hardware (Models B21 and B22 only). See Figure 220 on page INST-32 for a  
| detailed list.
- \_\_\_ 12. Library Door Keys (not included with Model B00). The five-digit number from the key tag may be printed on a label that is located under the right cartridge magazine. Look through the priority cell and underneath the right corner of the right cartridge magazine for the key code label. If the label is not present, record the five-digit number from the key tag here \_\_\_\_\_. If the keys are lost or need to be replaced, additional keys can be ordered from:

Attention - IBM Account Manager  
Fort Lock Corp.  
3000 North River Road  
River Grove, IL 60171  
708-456-1100  
708-456-9476 FAX

Specify Vendor P/N - G010103AX-3228 (C1038AD 'Short' with IBM Logo) along with the five-digit code that came with the original keys.

The following items are also provided:

- \_\_\_ 1. If the Bar Code Reader feature 2011 is specified, the feature comes pre-installed in the Magstar MP Tape Subsystem.
- \_\_\_ 2. One device driver diskette, as appropriate for the host system.  
**Note:** A device driver diskette is not needed for AS/400 systems. The device driver is part of the operating system.
- | \_\_\_ 3. If this is a Model B21 or B22 attached to an IBM Netfinity 5500/7000 or IBM PC Server 325/330  
| system, a 2944/UW Fast and Wide SCSI adapter, P/N 08L6517, will be included and packaged  
| with installation instructions. The adapter and instructions should be given to the customer so that  
| they may install it on the PC System. Install information pamphlet is included with adapter.
- \_\_\_ 4. The *Magstar MP 3570 Tape Subsystem Operator Guide, B-Series Models, GA32-0345.*
- \_\_\_ 5. The *IBM Magstar MP 3570 Tape Subsystem Maintenance Information, B-Series Models P/N 05H9395.*
- \_\_\_ 6. The *IBM SCSI Tape Drive, Medium Changer, and Library Device Installation and User's Guide, GC35-0154.*

Figure 194 (Page 1 of 2). Available Power Cords for Magstar MP 3570 Tape Subsystem

Magstar MP P/N and Feature Code	Description
46F5893 (FC 9080 and 9986)	Watertight Plug/Power Cord, Chicago
46F5894 (FC 9080 and 9800)	Watertight Plug/Power Cord, U.S.A.

Figure 194 (Page 2 of 2). Available Power Cords for Magstar MP 3570 Tape Subsystem

Magstar MP P/N and Feature Code	Description
6952300 (FC 9800)	9ft Power Cord, 125V, 10A U.S.A./Canada
13F9961 (Netfinity)	2.7m Power Cord, 250V, 10A France
13F9979 (FC9820)	2.7m Power Cord, 250V, 10A France
13F9997 (FC9821)	2.7m Power Cord, 250V, 10A Denmark
14F0033 (FC9825)	2.7m Power Cord, 250V, 10A U.K.
14F0087 (FC9827)	2.7m Power Cord, 250V, 10A Israel
14F0051 (FC9828)	2.7m Power Cord, 250V, 10A Switzerland
14F0015 (FC9829)	2.7m Power Cord, 250V, 10A South Africa
14F0069 (FC9830)	2.7m Power Cord, 250V, 10A Italy
13F9940 (FC9831)	2.7m Power Cord, 250V, 10A Australia
1838574 (FC9833)	9ft Power Cord, 250V, 10A U.S.A./Canada
34G0253 (Netfinity)	Power Cord, 250V
6952301 (FC9986)	6ft Power Cord, 125V, 10A Chicago

Figure 195. Attachment Features for Magstar MP 3570 Tape Subsystem

Magstar MP P/N and Feature Code	Description
P/N 49G6456 (FC 5205)	0.5m (2ft) SCSI Cable (SCSI Bus Jumper)
P/N 49G6458 (FC 5212)	12m (39ft) SCSI Cable
P/N 49G6459 (FC 5218)	18m (59ft) SCSI Cable
P/N 49G6457 (FC 5245)	4.5m (15ft) SCSI Cable
P/N 05H9527 (Models B21 and B22)	0.5–m (2–ft) SCSI Cable (SCSI Bus Jumper)
P/N 05H9651 (Models B21 and B22)	4.5–m (15–ft) SCSI Cable
P/N 08L6201 (FC 5225)	25–m (81–ft) SCSI Cable

## Tools and Test Equipment

The following items will be needed but are not in the ship group:

- Host Online Test routines (if available)
- Nut-driver for rack installation (7 mm) with extension
- Flat-blade screwdriver
- SCSI wrap tool P/N 05H9163
- RS-422 9-pin to 25-pin interposer P/N 05H3895
- RS-422 Wrap Plug P/N 39F3884
- Wrench Kit (Model B21 and B22 only) P/N 08L6557
  - 3mm Hex Wrench
  - 4mm Hex Wrench



**Note: DO NOT use any magnetized tools on or near the head assembly, as they will destroy the head!**

## Before You Begin

If the host system has any software or written instructions for system upgrades, use those instructions.

If there are no specific host system software aids or written instructions for system upgrades, use the following installation instructions. You may need to refer to your host system management or system hardware books to locate information you need to install the 3570.

Models B01, B02, B11 and B12, B21 and B22 may be installed only for horizontal operation.

### RS/6000 Note:

Check that the flash memory on the SCSI adapter in the system contains the proper level of microcode. Affected machine types include any system that contains a SCSI-2 Differential F/W adapter (4-6), or SCSI-2 Enhanced Differential F/W adapter (4-C).

To determine if your machine has an adapter with downlevel microcode, type this command on an AIX prompt: **lscfg -vl ascsi\* | pg**

To determine if you have a 4-6 or 4-C SCSI adapter, look at the lines labeled **Displayable Message** and **Loadable Microcode Level**.

The **4-6** adapter will indicate:

```
Displayable Message.....SCSI-2FWSD
Loadable Microcode Level..... 1
```

The **4-C** adapter will indicate:

```
Displayable Message.....SCSI-2FWSD
Loadable Microcode Level..... 8
```

Look for the line **ROS Level and ID** which should show as:

```
ROS Level and ID .....XX
```

For the 4-6:

**XX** should be either 67, 68, 70, 72, 73, 74, or higher.

If 74 or higher is displayed, there is no need to apply any update to the 4-6.

For the 4-C:

**XX** should be either C4, C5, C6 or, higher.

If C6 or higher is displayed, there is no need to apply any update to the 4-C.

Level 74 & C6 or higher microcode is strongly recommended for use with IBM Magstar MP tape drives, to ensure optimum performance and reduced errors. It may also resolve problems with other sequential SCSI devices (or devices that do not support command queuing) that are attached to dedicated F/W controllers and used in systems with multiple F/W adapters.



**AS/400 Note:**

PTFs are required prior to attaching a 3570 Magstar MP Tape Subsystem to an AS/400 system. The PTFs for all supported AS/400 releases are listed in INFO APAR II10363. This info APAR contains the most current PTF information for all supported releases and important information concerning the attachment of the 3570 Magstar MP Tape Subsystem to the AS/400 system.

After installing the appropriate PTFs, a SAVSYS must be done to ensure the new IOP code is available during a system recovery.

Figure 196. PTFs Required for AS/400 Systems

- \_\_\_ 1. If you are installing a Magstar MP Tape Subsystem Model B02, B12 or B22 in a Split Configuration, go to 7 on page INST-6. Otherwise, continue with the next step. (See "Library Configurations" on page LIBRARY-7 for an explanation of Base and Split Configurations.)
- \_\_\_ 2. Record the host processing unit \_\_\_\_\_.
- \_\_\_ 3. Record the host processing unit SCSI port \_\_\_\_\_.  
**Note:** If attaching the library to an AS/400 system, only one library can be attached to a port. (There are two ports per SCSI controller.)
- \_\_\_ 4. Record the SCSI address to be used for drive 1\_\_\_\_\_. (It is recommended that SCSI address 0 be used for connection to AS/400 systems.)
- \_\_\_ 5. If you are installing a Model B02, B12 or B22, record the SCSI address to be used for tape drive 2\_\_\_\_\_. (The SCSI address for tape drive 2 must be different from the SCSI address used for tape drive 1) unless each is attached to different host.
- \_\_\_ 6. Continue with step 13.
- \_\_\_ 7. Record the host processing unit that will attach to tape drive 1\_\_\_\_\_.
- \_\_\_ 8. Record the host processing unit that will attach to tape drive 2\_\_\_\_\_.
- \_\_\_ 9. Record the host processing unit SCSI port that will attach to tape drive 1\_\_\_\_\_.  
**Note:** If attaching the library to an AS/400 system, only one library can be attached to a port. (There are two ports per SCSI controller.)
- \_\_\_ 10. Record the host processing unit SCSI port that will attach to tape drive 2\_\_\_\_\_.
- \_\_\_ 11. Record the SCSI address to be used for drive 1\_\_\_\_\_. (It is recommended that SCSI address 0 be used for connection to AS/400 systems.)
- \_\_\_ 12. Record the SCSI address to be used for drive 2\_\_\_\_\_. (It is recommended that SCSI address 0 be used for connection to AS/400 systems.)
- \_\_\_ 13. Determine the proper way to do a controlled shutdown and system startup of the host system.
- \_\_\_ 14. If you are installing the 3570 in an AS/400 environment, ensure that the customer has the AS/400 System Value for Autoconfigure Devices set to **on**.

| If you are installing the 3570 in a 9309 rack (AS/400 or RS/6000 attached), go to "Rack-Mounted Models  
| (Models B11 and B12) Without Tray" on page INST-14

If you are installing the 3570 in a 9309 rack **with tray** (AS/400 or RS/6000 attached), go to  
"Rack—Mounted Models (B11 and B12) With Tray" on page INST-22.

- | If you are installing the 3570 in a Netfinity 5500 or 7000 rack (PC attached using Windows NT), go to
- | “Rack-Mounted Models (Models B21 and B22)” on page INST-32.

If you are installing a drive-only or stand-alone model, go to “Placing the Drive-Only or Stand-Alone Models” on page INST-8.



---

## Placing the Drive-Only or Stand-Alone Models

The Model B00 is a drive-only device. Models B01, B02 are stand-alone library models. All drive-only and stand-alone models may be installed by the customer or service representative. When the service representative installs these devices, it is a customer billable call. This information is included here to ensure that you understand the restrictions and recommendations for this device.

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

**C1** CAUTION The 3570 Model B01 weighs approximately 35 kilograms (77 pounds); it takes three persons to safely lift this unit.

**C3** CAUTION The 3570 Model B02 weighs approximately 40 kilograms (88 pounds); it takes three persons to safely lift this unit.

**Note:** This notice is translated into selected languages. See **C1** and **C3** in the INSP section. The 3570 can be located anywhere that is convenient to the system unit. The only restrictions to the location of the 3570 are the length of the power cord(s) and the length of the SCSI cable(s).

### Attention

This is a precision device that requires careful handling to prevent data loss or permanent damage to the 3570.

Avoid bumping or dropping the 3570.

Do not place the 3570 in a dusty location.

Do not grasp the operator panel display (see 1 , Figure 51 on page LIBRARY-2) when lifting any library model from the shipping container.

**Note:** Some external devices attached to the system unit can be stacked. Do not place more than one other 3570 on top of the 3570 when stacking external devices.

- \_\_\_ 1. Open the shipping container and inventory the parts listed on the 3570 bills of material.
- \_\_\_ 2. Place the device in the desired position.
- \_\_\_ 3. Install pedestal hardware on the table-top device as follows:
  - a. On the library, attach the pedestals to the bottom of the unit using the four screws provided, for operation in the horizontal position. The Models B01 and B02 may only be installed for horizontal operation.

**Note:** All stand-alone library models come with a pedestal which must be installed. The library model front door will not open properly if the pedestals are not installed.
  - b. For drive-only boxes: If the Model B00 is to be used in a vertical position, attach the pedestal to the side of the Model B00 with a single screw. Model B00 may be installed for either vertical or horizontal operation.
- \_\_\_ 4. If this device is a library model, go to “Installation Checkout—Library Models” on page INST-43.
- \_\_\_ 5. If this device is a drive-only model without a cartridge loader feature, go to “Setting the SCSI Address—Drive-Only Model B00” on page INST-9.

---

## Setting the SCSI Address—Drive-Only Model B00

The SCSI address switch is used to set the SCSI address in a drive-only model B00 and is set to X'0' at the factory.

This unique address identifies the 3570 to the system unit.

- \_\_\_ 1. Be sure the power switch for the 3570 is set to the Off position.
- \_\_\_ 2. Refer to Figure 197 and remove the front cover, item 2 by pressing the two side buttons, item 1 and pulling the cover from the front of the drive.
- \_\_\_ 3. Refer to Figure 198 on page INST-10 and, with the drive exposed, remove the drive inner cover, item 3 by pressing down on the center top of the cover and tilting it outward for removal. This will expose the SCSI address switch, item 4, located in the upper right hand corner.
- \_\_\_ 4. Set the rotary SCSI address switch (see 4 in Figure 198 on page INST-10), located in the upper right corner near the drive gear, to the specified address. The switch is set to 0 at the factory.  
**Note:** Use the SCSI address previously selected and recorded per the instructions and checklist in “Before You Begin” on page INST-5.  
**Note:** For connection to an AS/400 system, it is recommended that the SCSI address switch is set to '0'.
- \_\_\_ 5. Securely place the drive inner cover back on the front of the drive unit, and place the outer cover back on the front of the 3570.

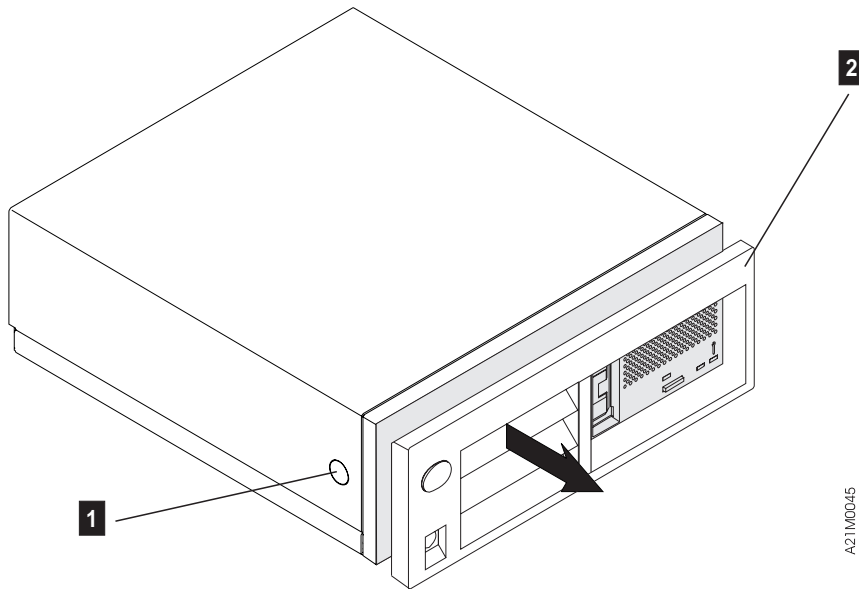
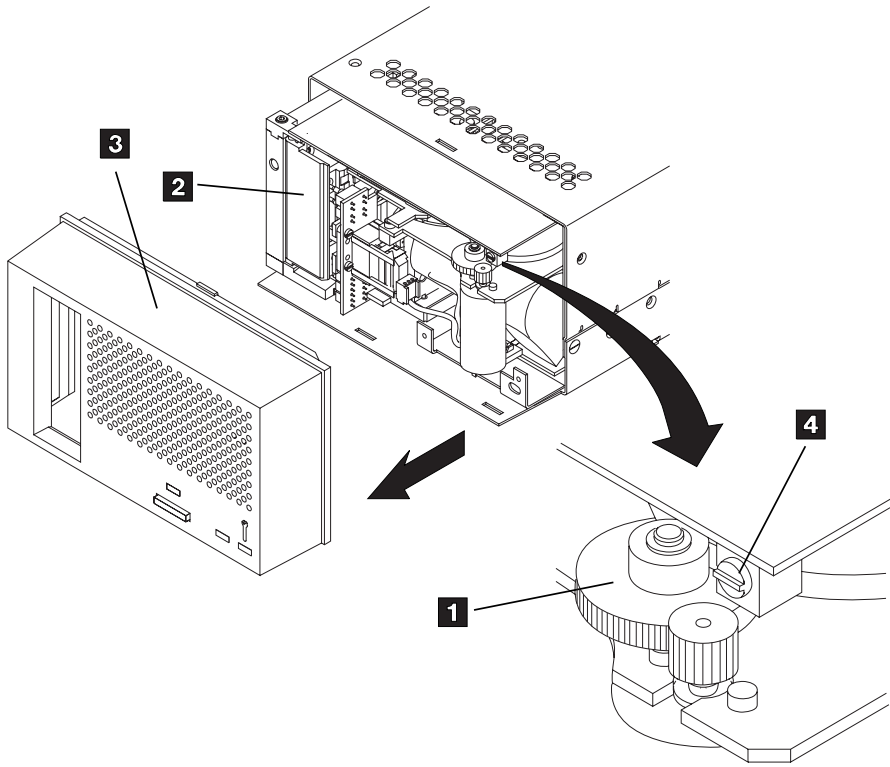


Figure 197. Model B00 Drive Outer Cover Configuration



A22C0031

Figure 198. Model B00 Drive Inner Cover Configuration

## Installation Checkout—Drive-Only Model B00

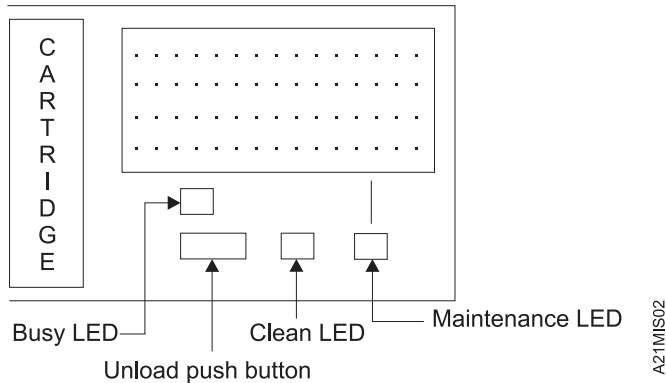


Figure 199. Operator Panel, Drive-Only Models

- \_\_\_ 1. Ensure that the power On/Off switch on the 3570 is in the Off position.
- \_\_\_ 2. A SCSI Wrap Tool, P/N 05H9163, is not part of the ship group, but is available through the service branch. If you have this tool available, perform “SCSI Port Wrap Test” on page PROC-84, then go to 7 on page INST-11. If the tool is not available, continue with the next step.
- \_\_\_ 3. Connect the power cable to the 3570.
- \_\_\_ 4. Connect the power cable to the power source outlet.
- \_\_\_ 5. Place the power switch to the On position.

If the Maintenance, Busy and Clean LEDs flash, or the Maintenance LED comes on continuously and stays on after five minutes, go to the START section.

### Hint

The Maintenance LED is on continuously until the 3570 microcode is up and running, then it starts blinking.

The Maintenance LED continues to blink until all of the power-on self-tests (POSTs) are completed.

If the Maintenance LED continues to blink, along with the Busy and Clean LEDs, the diagnostics found a fault with the 3570. Go to the START section to fix the fault.

End of Hint

- \_\_\_ 6. To ensure that the read/write functions work correctly, perform the procedure at “Verify Fix—Drive-Only Models” on page PROC-9. If this operation does not complete successfully, go to the START section to fix the fault.
- \_\_\_ 7. Place the power switch to the Off position.
- \_\_\_ 8. Remove the SCSI wrap tool from the SCSI connector if installed earlier.

## Connecting the SCSI Cable to the Drive Subsystem

1. If the Magstar MP is the first or only SCSI device connected in line to the initiator, connect the SCSI interface cable coming from the initiator to the leftmost SCSI connector on the back of the Model B00 (see item 3 in Figure 202 on page INST-13).
2. If the Magstar MP is not the first device on the SCSI bus, connect the SCSI interface cable coming from the next closest device to the leftmost SCSI connector on the back of Model B00 (see item 3 in Figure 202 on page INST-13).
3. If this is the last device on this SCSI bus, locate the SCSI interface terminator (P/N 61G8324) and attach it to the rightmost SCSI connector on the back of the Model B00 (see item 2 in Figure 202 on page INST-13).

**Note:** There are two SCSI connectors on the back of the Magstar MP Model B00. When connected correctly, each of these connectors must have either a SCSI interface cable or a SCSI terminator attached.

4. Go to “Online Tests for Models B01, B02, B11, B12, B21 and B22” on page INST-67.

Figure 200 shows an example of a single Magstar MP attached to the host (initiator). Figure 201 shows an example of attaching multiple SCSI devices to a host.

**Note:** The figures do not show any interposers if needed.

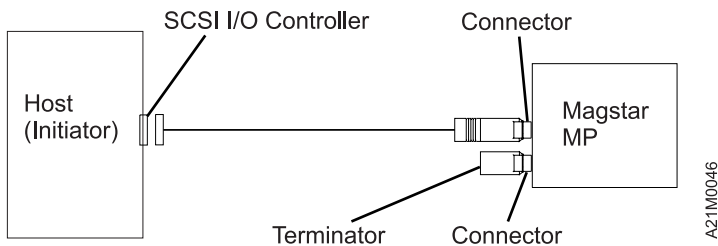


Figure 200. Example of Attaching One SCSI Device to the Host (Initiator)

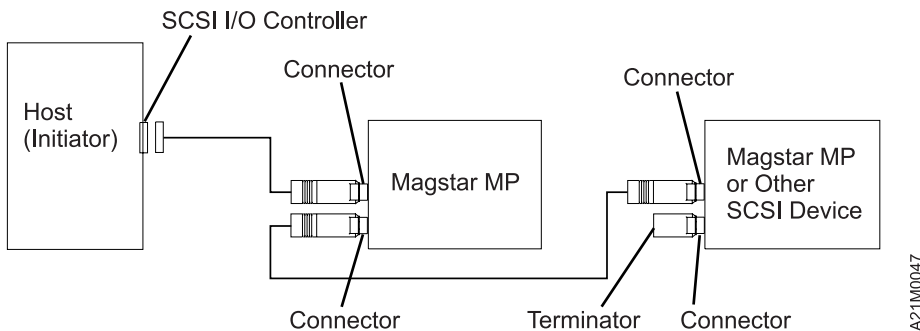
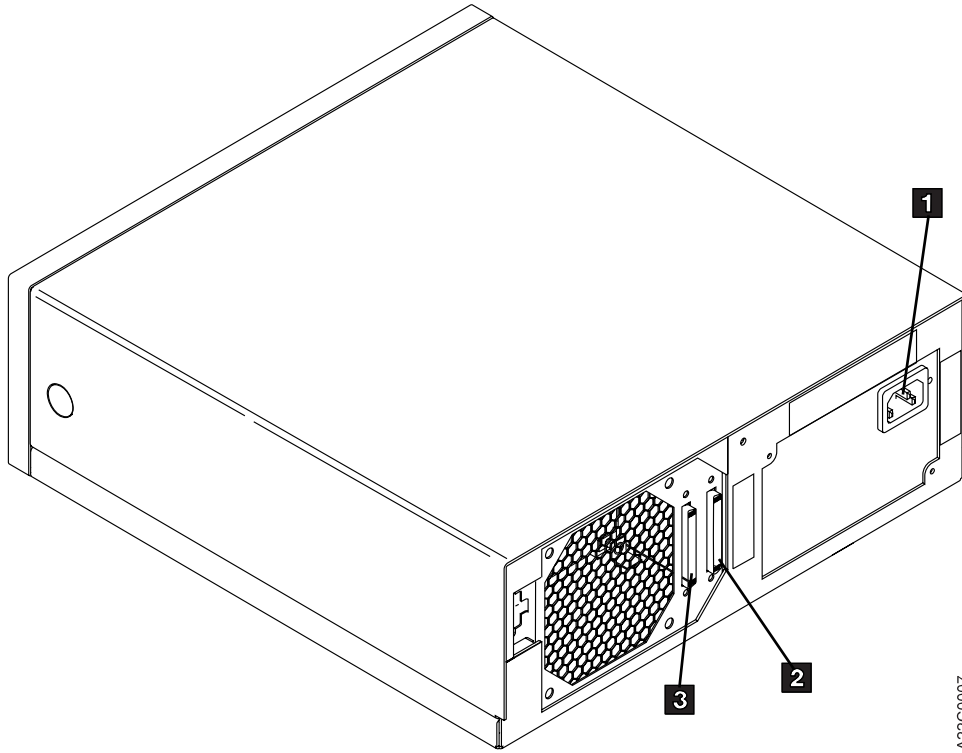


Figure 201. Example of Attaching Multiple SCSI Devices to the Host





A22C0007

Figure 202. Drive-Only Model B00 SCSI Connection

## Rack-Mounted Models (Models B11 and B12) Without Tray

When you are installing a Model B11 or Model B12 (rack-mounted unit) in a 9309 rack, you are instructed to locate components by EIA rack unit and hole location. All hole locations are specified within contiguous EIA rack units.

1. Figure 220 on page INST-32 lists the parts necessary for the rack mount installation. Ensure that you have the necessary hardware to begin the installation.
2. Position the shipping container that contains the 3570 in front of the rack.
3. Position the rack and locate the physical area in the rack where the 3570 is to be installed.

**Note:** Because of the weight of the 3570, it is recommended that the 3570 be installed in the rack as low as possible.

The 3570 requires six EIA units. Each EIA unit consists of three holes in the rack. The supporting slides must be installed level in the rack. Figure 204 on page INST-15 shows the location of the holes used.

EIA unit number 32 (top of rack) only has two holes, all other EIA units have three holes. EIA unit numbers are shown in the rear of the rack.

4. Ensure that the rack stabilizer is installed. See *7202 Install and Service Guide*, *7015 Install and Service Guide*, or *9309 Model 1 and 2 Setup and Operator Guide*

Figure 203. Rack Mounted Hardware List

Part Number	Quantity	Description
375714	1	Right side rail
375816	1	Left side rail
74F1823	2	Nut clips
1624778	6	Screws, M5 x 12
49G6525	2	Brackets

**Note:** Actual part numbers and quantities may change. Rely on the shipping list for actual part numbers and quantities.

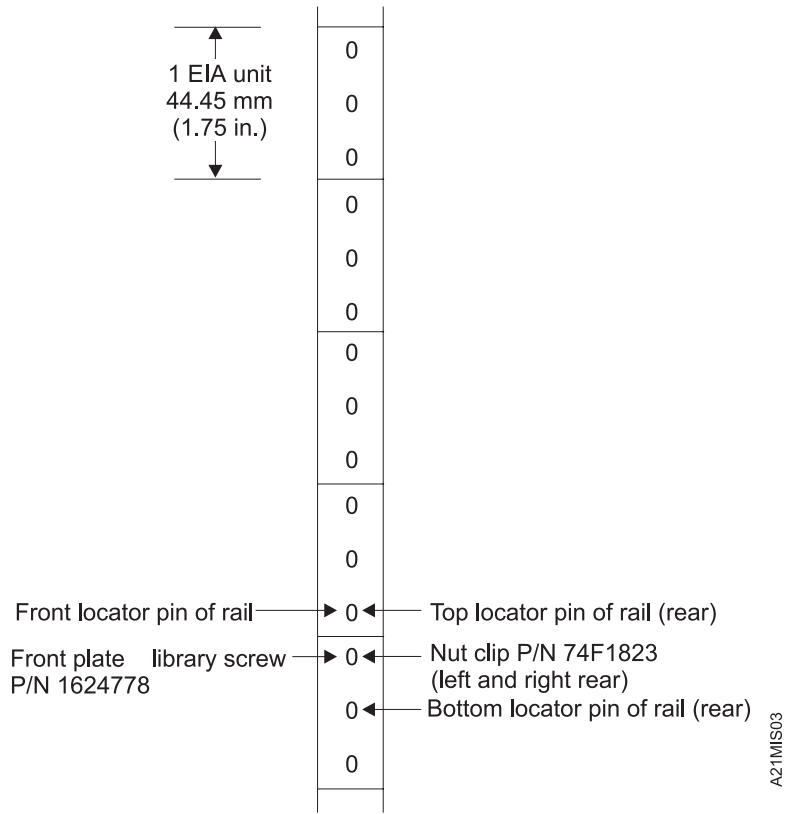


Figure 204. EIA Unit Holes



## Unpacking the Library Models

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

### C1

**CAUTION:**

The 3570 Model B01 weighs approximately 35 kilograms (77 pounds); it takes three persons to safely lift this unit.

### C2

**CAUTION:**

The 3570 Model B11 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.

### C3

**CAUTION:**

The 3570 Model B02 weighs approximately 40 kilograms (88 pounds); it takes three persons to safely lift this unit.

### C4

**CAUTION:**

The 3570 Model B12 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.

## Installing Supporting Rails in Rack

When installing the library models in a rack, five EIA rack units must be available. Each EIA unit consists of three holes in the rack, except for the top EIA unit in the rack, which consists of two holes.

**Note:** When EIA rack units are referred to by their relative location, (the first or second EIA unit), count from the bottom of the five EIA-unit block reserved for the 3570. That is, the first EIA unit is the bottom EIA unit of the five EIA units.

- \_\_\_ 1. Count and mark the five EIA units on the left and right sides of the front and the rear of the rack.
- \_\_\_ 2. In the rear of the rack, install the nut clips P/N 74F1823 in the top hole of the bottom EIA units ( 2 and 5 ). Install the nut clips from the inside of the rack with the threaded holes on the inside of the rack system as shown on Figure 207 on page INST-18.

**Note:** The front of the rack does not require nut clips because the rails are threaded.

- \_\_\_ 3. The support rails to be installed have one locator pin in front and two locator pins in the rear. See Figure 205 on page INST-17. Install the left-hand (viewed from the front) rail P/N 375816 ( 4 ) and the right-hand rail P/N 375714 ( 3 ) so that:

The bottom locator pin in the **rear** of each rail is in the center hole of the first bottom EIA unit ( 1 and 6 in Figure 205 on page INST-17).

The locator pin in the **front** of each rail is in the bottom hole of the second EIA unit ( 7 and 9 in Figure 206 on page INST-17).

Ensure that the horizontal slide plates of the rails are level and aligned at the bottom holes of the first (bottom) EIA unit.

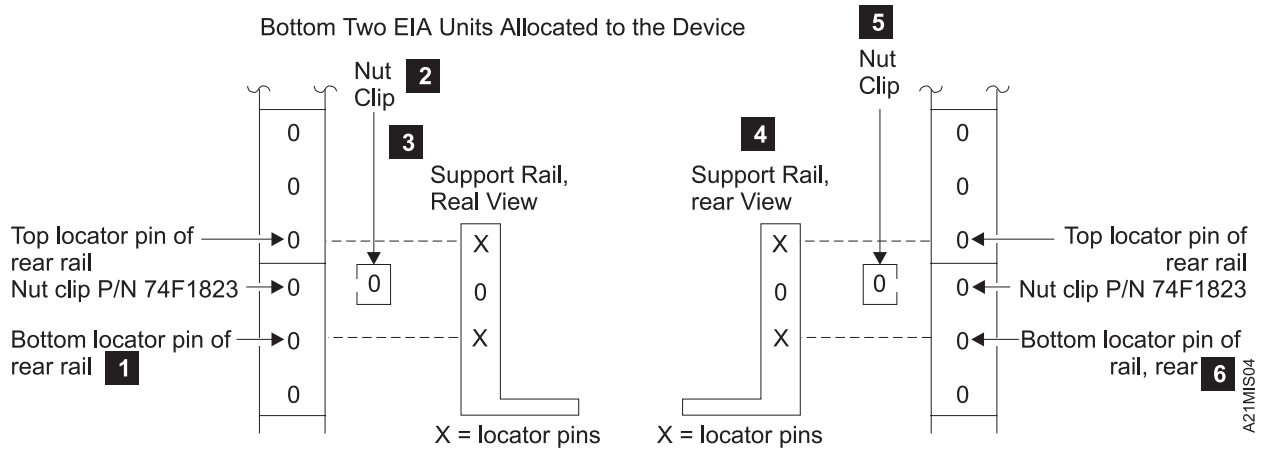


Figure 205. Installing Rail Hardware—Rear View

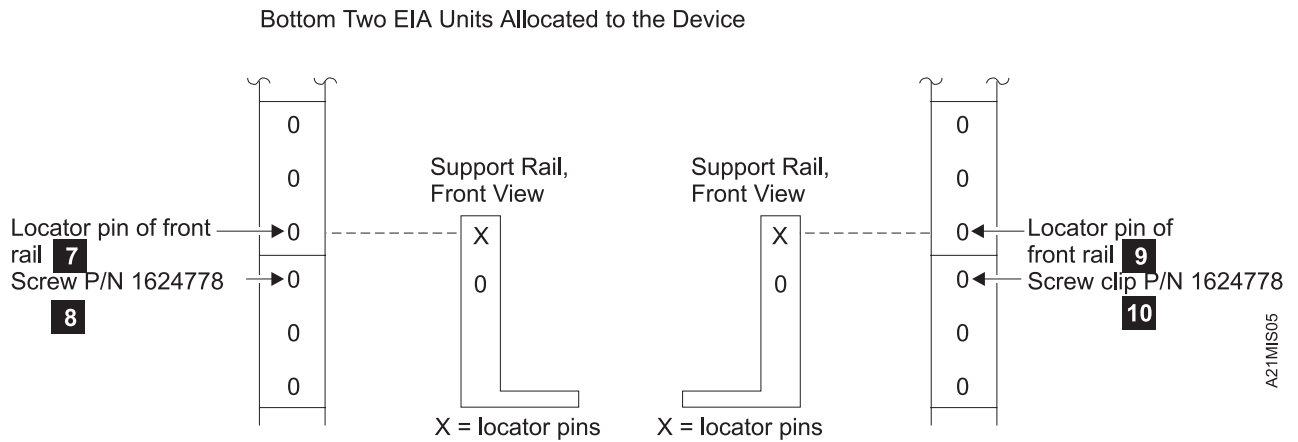
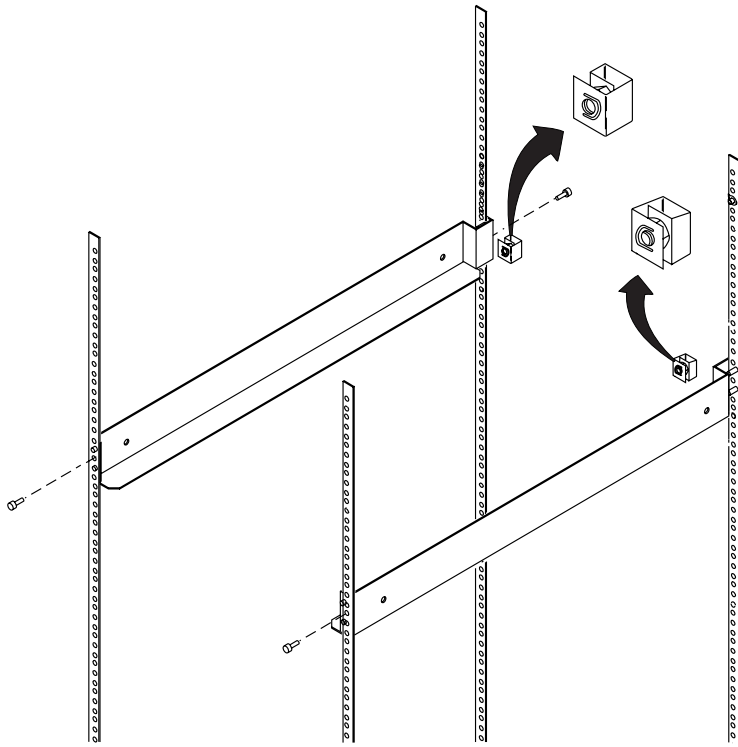


Figure 206. Installing Rail Hardware—Front View



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Figure 207. Attaching Support Bars to Rack

- \_\_\_ 1. See Figure 208. From the rear of the rack, attach the brackets P/N 49G6525 2 to the nut clips in the rails by using screws P/N 1624778 1. Ensure the longer end sections of the brackets are against the rear of the rail.
- \_\_\_ 2. Snug the rear screws so that you can position the brackets when you secure them to the rear of the device.

**Attention:** Ensure that you snug the screws enough so that the locator pins in the front rails cannot pull out of the rail holes.

**Note:** Do Not install the screws to the front rails until the 3570 has been placed in the rack.

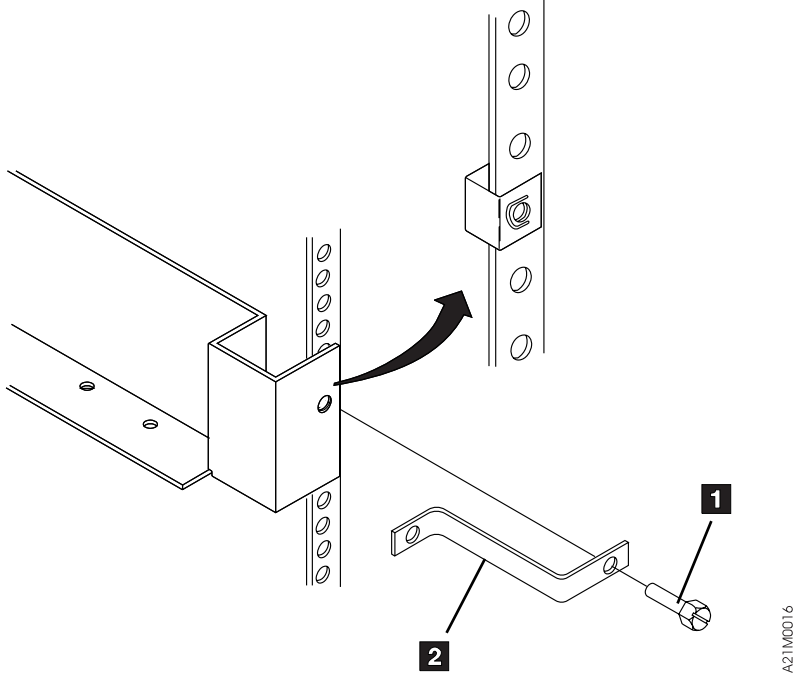


Figure 208. Attaching Bracket to Rear Side of Rack

## Installing the 3570 in a Rack

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

**C2** CAUTION The 3570 Model B11 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.

**C4** CAUTION The 3570 Model B12 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.

**Note:** This notice is translated into selected languages. See **C2** and **C4** in the INSP section.

- \_\_\_ 1. If you have assistance to lift the 3570, go to step 12 on page INST-21.  
If you do not have assistance, use the rack hoist P/N 69X5542 (branch office tool) or equivalent to install the 3570.
- \_\_\_ 2. Install the rack hoist using the instructions provided.
- \_\_\_ 3. Position the 3570 shipping container in front of the rack.
- \_\_\_ 4. See Figure 209. Route one end of the hoist sling strap 1 under the 3570 while still in the shipping container.

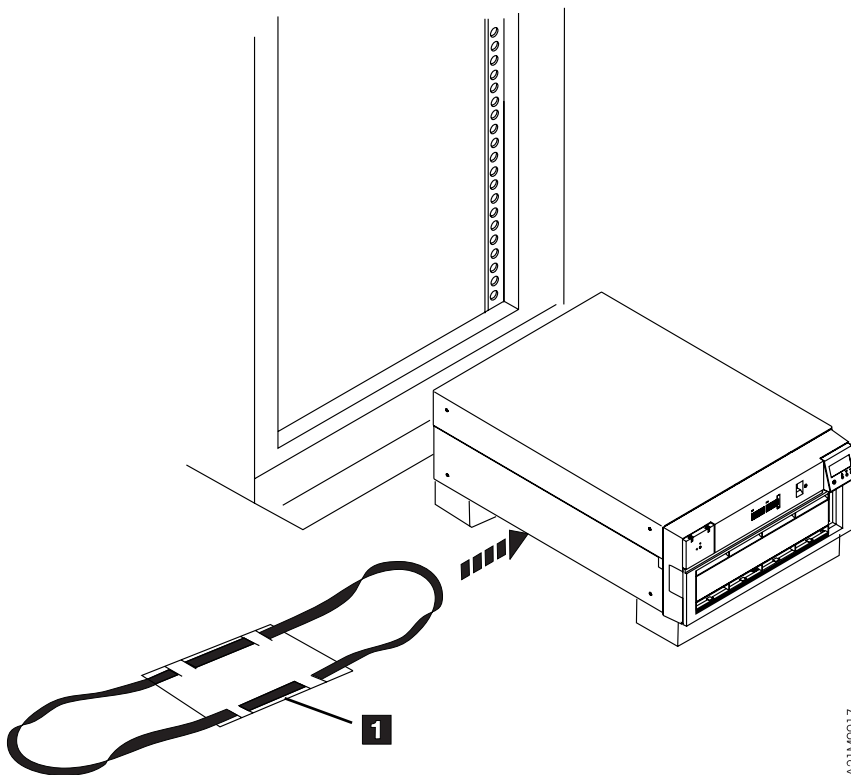


Figure 209. Sliding Strap Under Drive

- \_\_\_ 5. Attach the sling to the hoist.  
**Attention:** The balance point of the 3570 is toward the rear of the 3570.
- \_\_\_ 6. Raise the 3570 slightly to check for proper balance. If required, lower the 3570 and readjust the position of the sling.
- \_\_\_ 7. See Figure 210 on page INST-21. Raise the 3570 by using the hoist 1 until it clears the shipping container.



- \_\_\_ 8. Move the shipping container away from the rack far enough so you can complete the installation.
- \_\_\_ 9. Slide the 3570 completely onto the rails 2 .
- \_\_\_ 10. Remove the rack hoist and store it by using the instructions supplied with the rack hoist.
- \_\_\_ 11. Go to step 13.

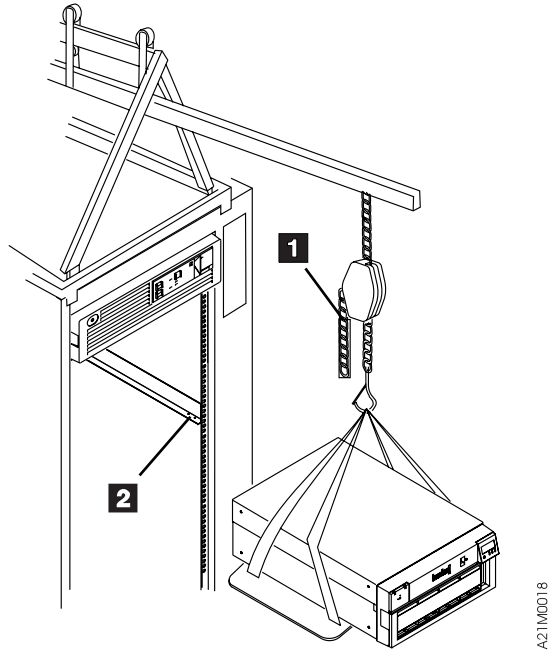


Figure 210. Raising 3570 Using Hoist

- \_\_\_ 12. In the front of the rack, with assistance, lift the 3570 and slide the back of it toward the rear of the rack.
- \_\_\_ 13. Fasten the two rear brackets to the rear of the 3570 chassis with M5 x 12 screws (P/N 1624778).
- \_\_\_ 14. Tighten all the screws in the rear brackets.
- \_\_\_ 15. Unlock the door if necessary. Open the library front cover.
- \_\_\_ 16. In front of the rack, fasten the front plate of the library to the rack with screw P/N 1624778 in the top hole of the bottom EIA on the both sides of the rack ( 8 and 1 in Figure 206 on page INST-17). The screws attach to the support rails, providing additional support by holding the library front to the front of the rack.
- \_\_\_ 17. Continue install with “Installation Checkout—Library Models” on page INST-43

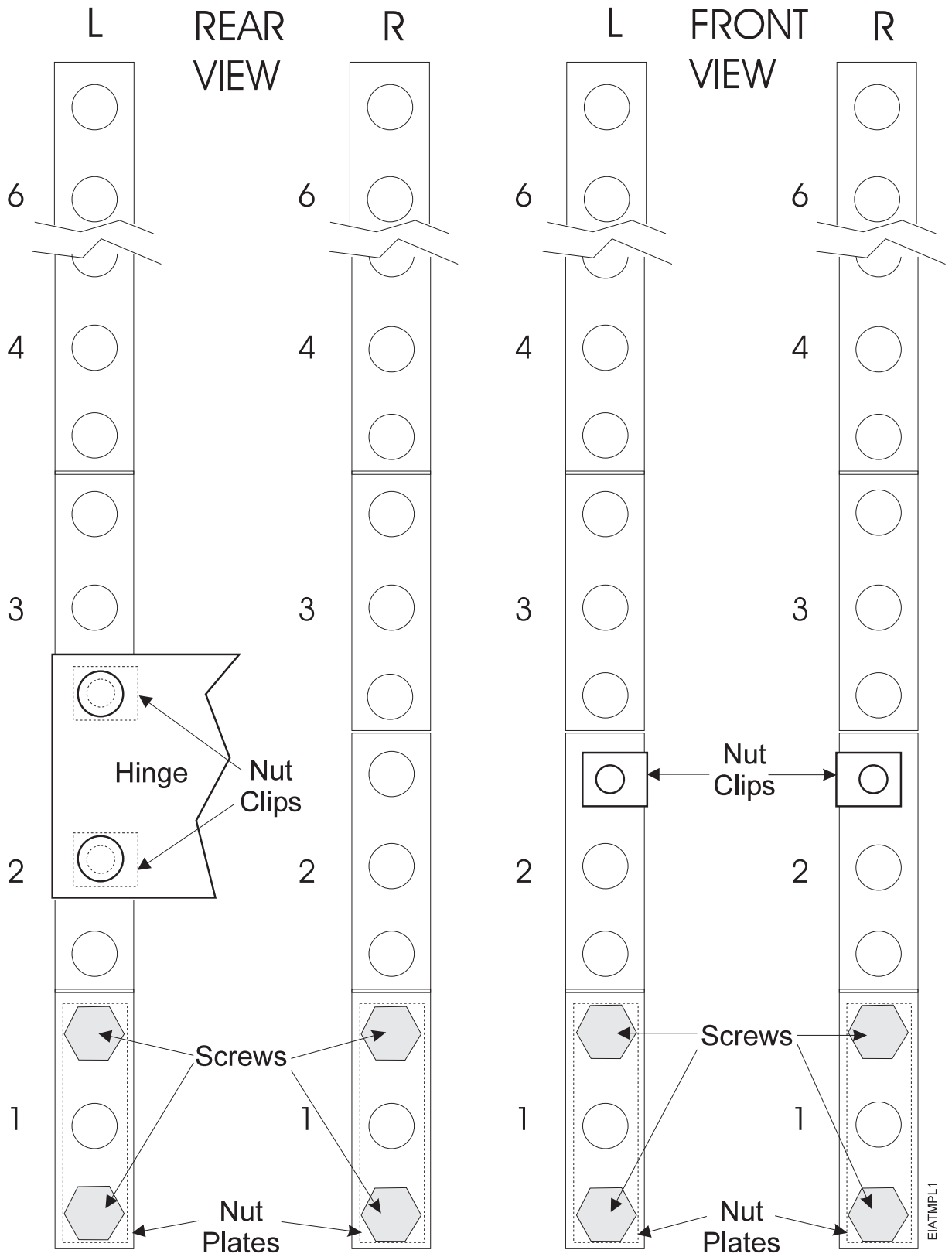
## Rack—Mounted Models (B11 and B12) With Tray

When you are installing a Model B11 or Model B12 (rack-mounted unit) in a 9309 rack, you are instructed to locate components by EIA rack unit and hole location. All hole locations are specified within contiguous EIA rack units.

1. Figure 211 lists the parts necessary for the rack mount installation. Ensure that you have the necessary hardware to begin the installation.

Figure 211. Rack Mounted Hardware List

Part Number	Quantity	Description
08L6254	1	Kit, rack mount tray, slides, and hardware
--	1	Right-hand Slide, Bracket and Tray assembly
--	1	Left-hand Slide and Bracket assembly
--	4	Nut-Plates
1621190	3	Screws, M4 x 8, Tray mounting
1622403	3	Nuts, M4, Tray mounting
1624778	8	Screws, M5 x 12, Slide mounting
1624778	6	Screws, M5 x 12, Cable Arm, Strain Relief and Drive Attach
45G0181	1	Cable Strain Relief assembly
05H2629	1	Strain Relief Clamp
05H9208	1	Cable Arm assembly
08L6271	1	Hinge, Cable assembly
74F1823	3	Nut-clips
1159519	12	Nut-Cable Ties
<b>Notes:</b>		
1. Actual part numbers and quantities may change. Rely on the shipping list for actual part numbers and quantities.		
2. Items in table with -- are part of Kit 08L6254		



| Figure 212. EIA Rack Template for Models B11 and B12

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- | \_\_\_ 2. Position the shipping container that contains the 3570 in front of the rack.
- | \_\_\_ 3. Position the rack and locate the physical area in the rack where the 3570 is to be installed.

| **Note:** Because of the weight of the 3570, it is recommended that the 3570 be installed in the  
| rack as low as possible.

| The 3570 requires six EIA units. Each EIA unit consists of three holes in the rack. The supporting  
| slides must be installed level in the rack. Figure 204 on page INST-15 shows the location of the  
| holes used.

| EIA unit number 32 (top of rack) only has two holes, all other EIA units have three holes. EIA unit  
| numbers are shown in the rear of the rack.

- | \_\_\_ 4. Ensure that the rack stabilizer is installed. See *7202 Install and Service Guide*, *7015 Install and Service Guide*, or *9309 Model 1 and 2 Setup and Operator Guide*

## | **Installing Supporting Slides and Tray in Rack**

| When installing the library models in a rack, six EIA rack units must be available.

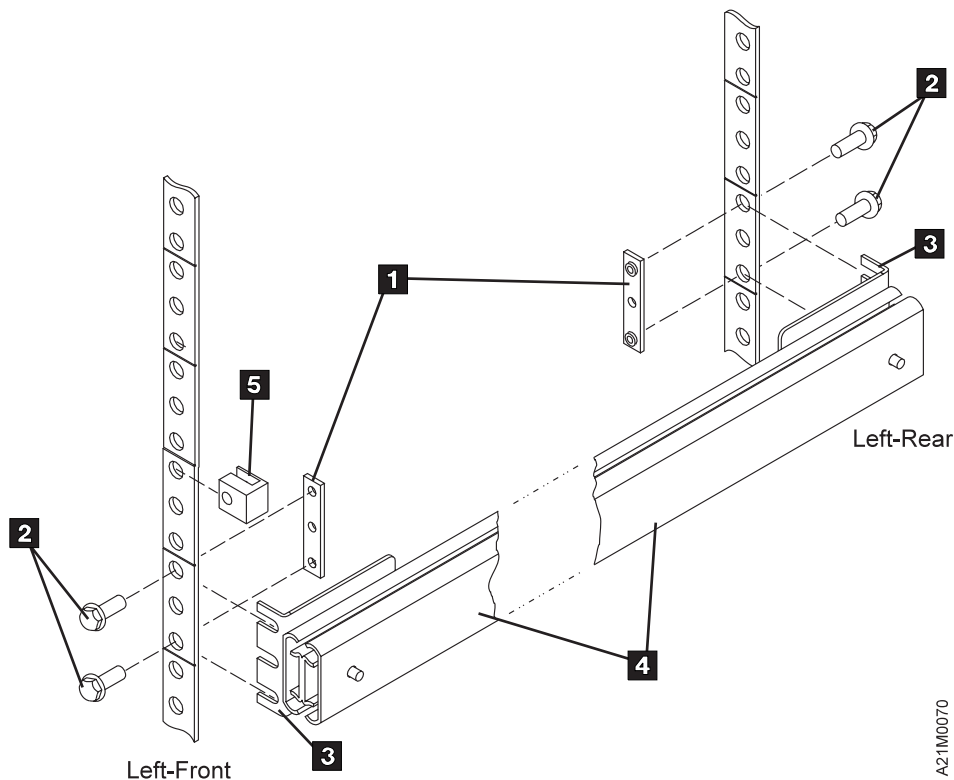
- | \_\_\_ 1. Determine which rack location the 3570 will be installed in. Count and mark the six EIA units on  
| the left and right sides of the front and rear of the rack.
- | \_\_\_ 2. See Figure 213 on page INST-26. Install the two nut-plates 1 , using four screws 2 , P/N  
| 1624778, in the bottom EIA units on the left side, as shown. Leave the screws loose enough to be  
| able to insert the slide mounting brackets 3 under the nut-plates.
- | \_\_\_ 3. Install the left-hand slide assembly 4 . Insert the brackets 3 under the nut-plates 1 and  
| tighten the screws 2 .

### | **Notes:**

- | a. Ensure that the slide extends toward the front of the rack.
- | b. If it is necessary to adjust the length of the slide mounting brackets to fit the rack, **do not**  
| loosen the front mounting bracket screws. Do all of the adjustment with the rear mounting  
| bracket.

- | \_\_\_ 4. Install the nut-clip 5 , P/N 74F1823, in the top hole of the first EIA unit above the left slide as  
| shown in Figure 213 on page INST-26. The screw will be installed later in 8 on page INST-66.





| *Figure 213. Attaching left-hand slide and bracket assembly*

- | \_\_\_ 5. See Figure 214 on page INST-27. Install the right-hand slide and tray assembly 4 .
  - | \_\_\_ a. Install the two nut-plates 1 , using four screws 2 , P/N 1624778, in the bottom EIA units on the right side, as shown. Leave the screws loose enough to be able to insert the slide mounting brackets 3 under the nut-plates.
  - | \_\_\_ b. Raise the left side of the slide and tray assembly so the tray is tilted to the right. (The square hole in the center of the tray can be used as a hand hold.) Insert the tray assembly into the rack above the left-hand slide assembly.

| **Notes:**

- | 1) Ensure that the four drive mounting tabs are pointing up.
- | 2) If it is necessary to adjust the length of the slide mounting brackets to fit the rack, **do not** loosen the front mounting bracket screws. Do all of the adjustment with the rear mounting bracket.
- | \_\_\_ c. Insert the mounting brackets 3 under the nut-plates 1 on the right-hand side.

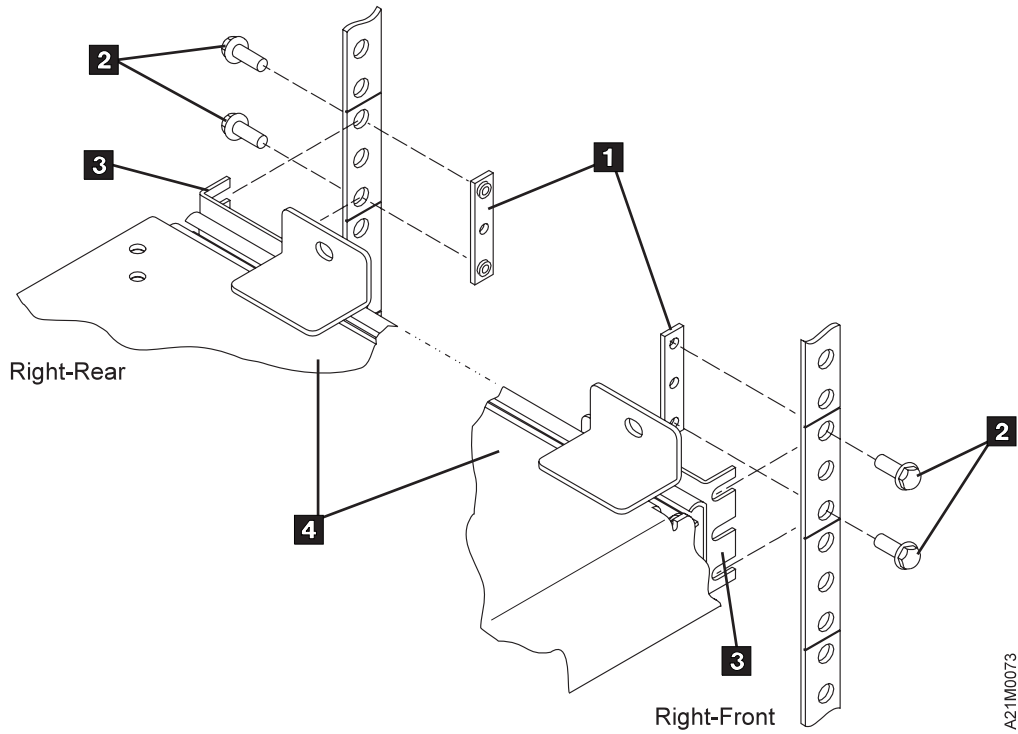


Figure 214. Attaching right-hand slide, bracket and tray assembly

- d. See Figure 215. Lower the left side of the tray down so the tabs on the tray 1 set on the top of the left-hand slide assembly 3. The brackets on the right-hand side should slide all the way under the nut-plates.

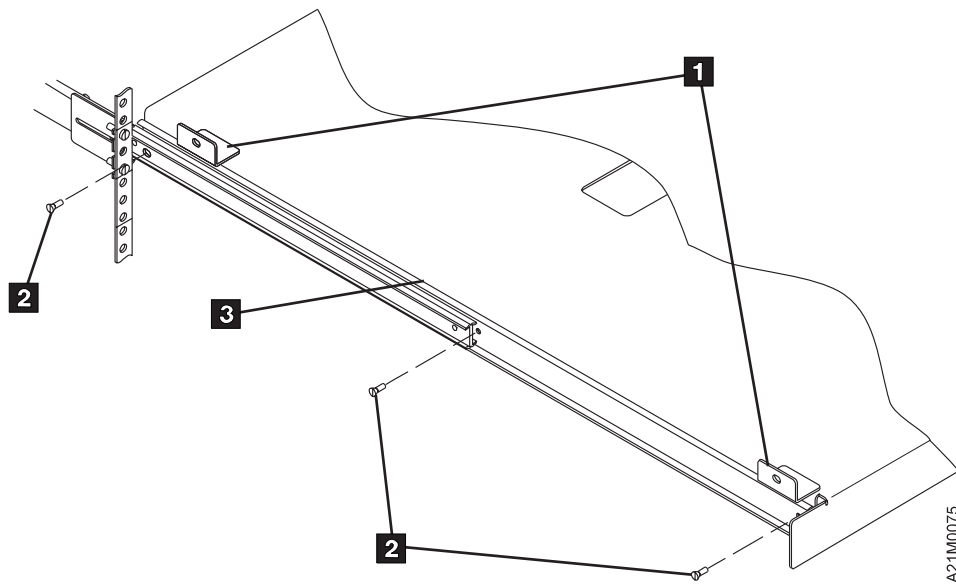
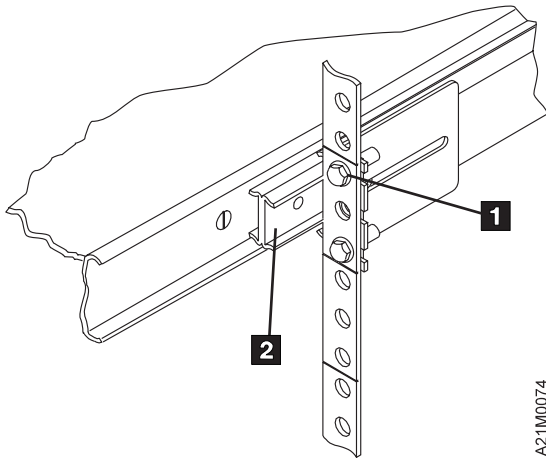


Figure 215. Attaching tray to left-hand slide

- 6. See Figure 216 on page INST-28. Pull the tray and slides out far enough so that the inner slide 2 extends out approximately 24mm (1 in.) past the rack frame 1.

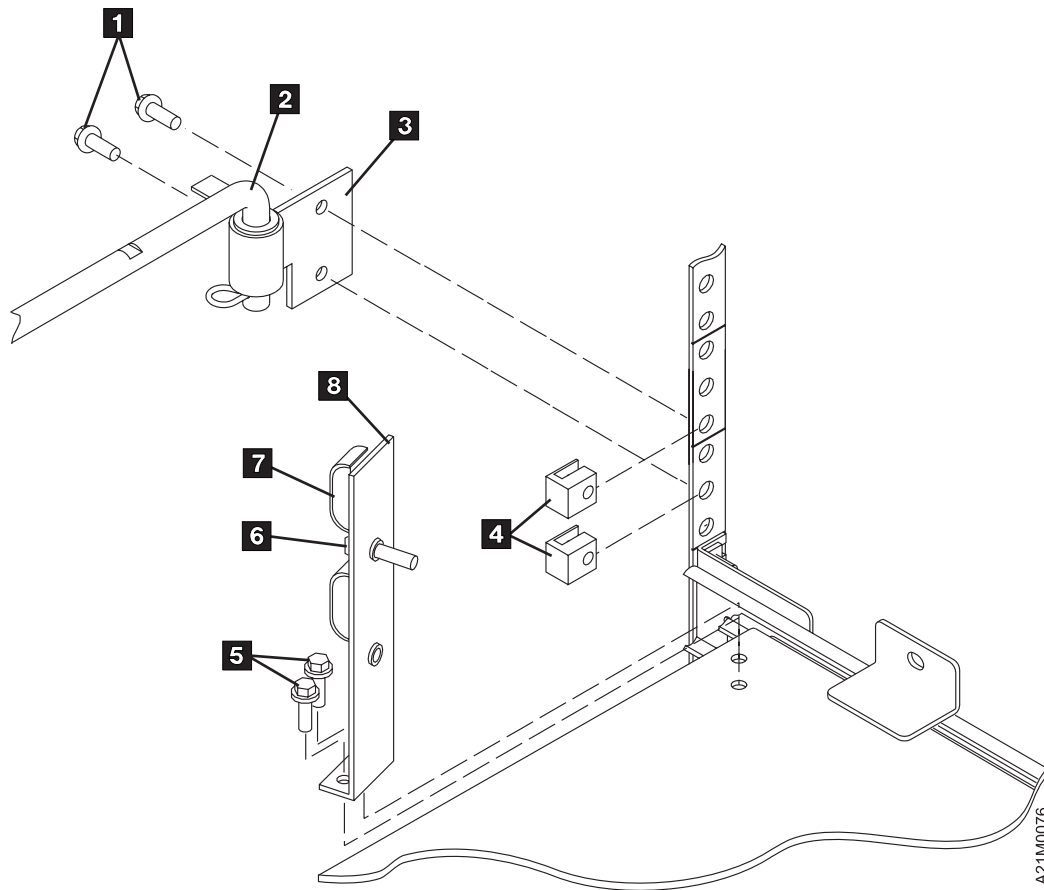
- 7. Ensure that the inner slides do not rub on the rack frame. Tighten all of the slide mounting screws 1.



| *Figure 216. Inner slide to rack clearance*

- | \_\_\_ 8. See Figure 215 on page INST-27. Pull the tray assembly out so the slides are extended all the way out.
- | \_\_\_ 9. Raise the left-hand side of the tray enough to align the holes in the tray with the mounting holes in the slide 3 . Attach the tray to the left-hand slide using three M4 x 8 screws 2 . After the screws are installed and tightened, install three M4 lock-nuts to the screws to prevent them from loosening.
- | \_\_\_ 10. Ensure that all of the 7mm hex-head screws holding the slides to the rack are tight.
- | \_\_\_ 11. Ensure that the slides operate properly. They should extend all the way out without binding or rubbing on the rack frame. Loosen the screws and adjust the slide mounting brackets, if necessary.
- | \_\_\_ 12. See Figure 217 on page INST-29. Install the cable strain relief bracket 8 , P/N 45G0181, using two screws 5 , P/N 1624778, at the right rear of the tray as shown.
- | \_\_\_ 13. Install the strain relief clamp 7 , P/N 05H2629, on the strain relief bracket with one screw 6 , P/N 1624778. Leave the screw loose at this time. The cables will be routed through the clamp in a later step.
- | \_\_\_ 14. Install the cable arm hinge 3 , P/N 08I6271, using two screws 1 , P/N 1624778, and two nut-clips 4 , P/N 74f1823, at the right rear of the rack as shown. The cable arm hinge should be installed in the EIA unit just above the right rear slide mounting position.
- | \_\_\_ 15. Install the cable arm assembly 2 , P/N 05H9208, in the hinge as shown. If there is a washer on the cable arm assembly, it should be installed on the bottom, just above the retaining pin.





| Figure 217. Attaching cable arm and strain relief

## | Installing the 3570 in a Rack with Slides and Tray, B11 and B12 Only

| **Note:** The **Rack Hoist** is only used when installing the Model B11 and B12 drives in a 9309 Rack system. The hoist is not used when installing the Models B21 and B22 in a Netfinity rack. For these models, the CE or customer will require assistance in lifting the drives onto the tray.

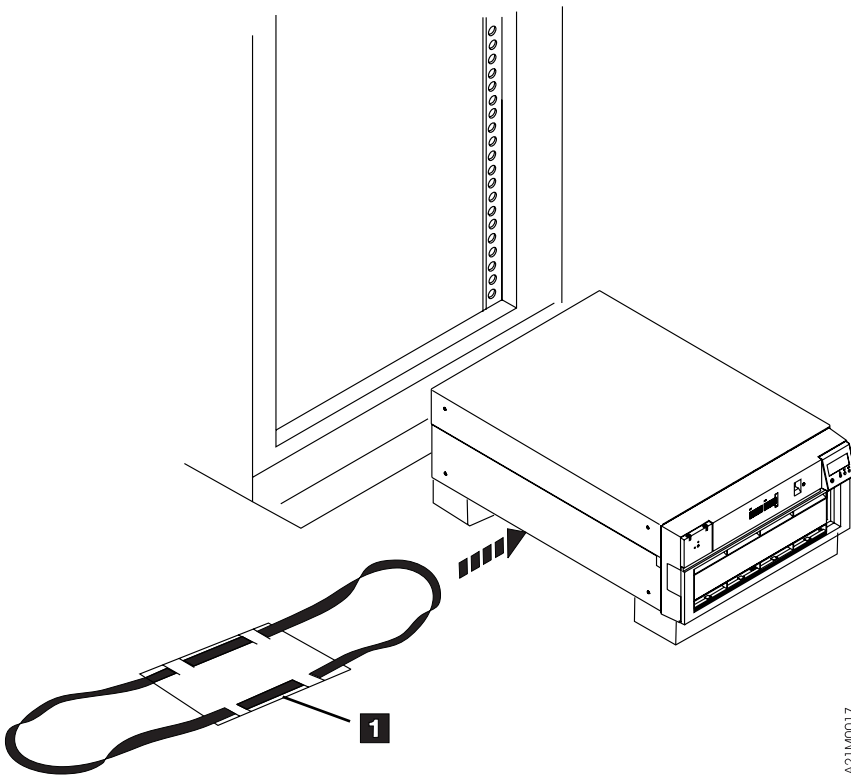
| The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

- | **C2** CAUTION The 3570 Model B11 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.
- | **C4** CAUTION The 3570 Model B12 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.

| **Note:** This notice is translated into selected languages. See **C2** and **C4** in the INSP section.

- | \_\_\_ 1. See Figure 226 on page INST-42. Remove the four corner screws 1 from the drive and retain them, they will be used in a later step to attach the drive to tray.
- | \_\_\_ 2. If you have assistance to lift the 3570, go to step 15 on page INST-31.  
If you do not have assistance, use the rack hoist P/N 69X5542 (branch office tool) or equivalent to install the 3570.
- | \_\_\_ 3. Install the rack hoist using the instructions provided.
- | \_\_\_ 4. Position the 3570 shipping container in front of the rack.

5. See Figure 218 on page INST-30. Route one end of the hoist sling strap 1 under the 3570 while still in the shipping container. If necessary, cut the sides of the box so you can get the strap under the 3570.



A21M0017

Figure 218. Sliding Strap Under Drive

6. Attach the sling to the hoist.

**Attention:** The balance point of the 3570 is toward the rear of the 3570.

7. Raise the 3570 slightly to check for proper balance. If required, lower the 3570 and readjust the position of the sling.

8. See Figure 219 on page INST-31. Raise the 3570 by using the hoist 1 until it clears the shipping container.

9. Move the shipping container away from the rack far enough so you can complete the installation.

10. Raise the 3570 above the slide and tray assembly.

11. Extend the slide and tray assembly 2 all the way out so it is locked in the extended position.

### C5

#### CAUTION:

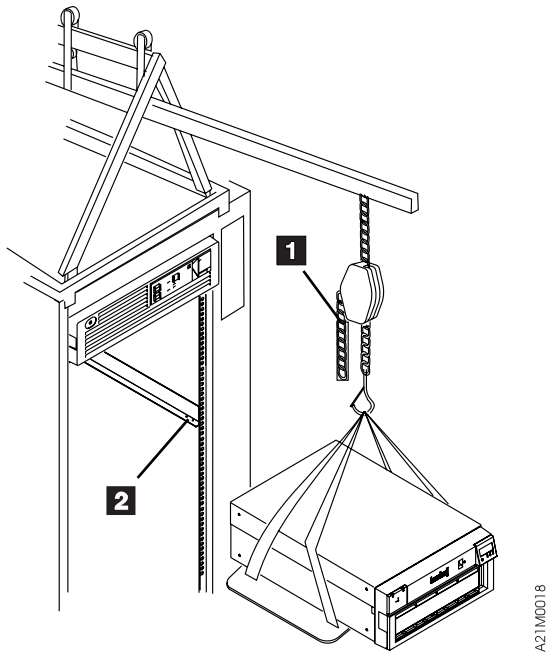
**When you are sliding the 3570 drive tray assembly in or out, make sure you do not get your hand caught between the drive and the rack. Also, when you are servicing the 3570, make sure the slide and tray assembly is fully extended and locked.**

**Note:** This notice is translated into selected languages. See C5 in the INSP section.

12. Lower the 3570 onto the tray. Ensure that the screw holes in the 3570 align with the holes in the mounting tabs on the tray.

13. Remove the rack hoist and store it by using the instructions supplied with the rack hoist.

| \_\_\_ 14. Go to step 16 on page INST-31.



| *Figure 219. Raising 3570 Using Hoist*

| \_\_\_ 15. Extend the slide and tray assembly 2 all the way out so it is locked in the extended position.

| **C5**

| **CAUTION:**

| **When you are sliding the 3570 drive tray assembly in or out, make sure you do not get your hand caught between the drive and the rack. Also, when you are servicing the 3570, make sure the slide and tray assembly is fully extended and locked.**

| **Note:** This notice is translated into selected languages. See C5 in the INSP section.

| \_\_\_ 16. With assistance, lift the 3570 and set it on the tray. Ensure that the screw holes in the 3570 align with the holes in the mounting tabs on the tray.

| \_\_\_ 17. Continue with 18.

| \_\_\_ 18. See Figure 226 on page INST-42. Fasten the four mounting tabs on the tray 1 to the four corners of the 3570 with the four screws that were removed in 1 on page INST-29.

| \_\_\_ 19. Move the tray and slide assembly into and out of the rack several times to ensure that the slides operate without binding

| \_\_\_ 20. Ensure that the rack doors will close without hitting the 3570.

| **Note:** In some racks the angled Operator Panel may interfere with the closing of the rack door. (For example, if the 3570 is installed in a Model 7014–S00 rack, the Operator Panel will interfere with the rack door unless the top of the 3570 is at EIA position 27 or 28.) An alternate Operator Panel housing is provided in the ship group for use in rackd where there is interference. If the Operator Panel interferes with the rack door, replace the angled Operator Panel housing with the non-angled Operator Panel. Refer to “FID 90: Library Operator Panel Display” on page CARR-36 for instructions.

## Rack-Mounted Models (Models B21 and B22)

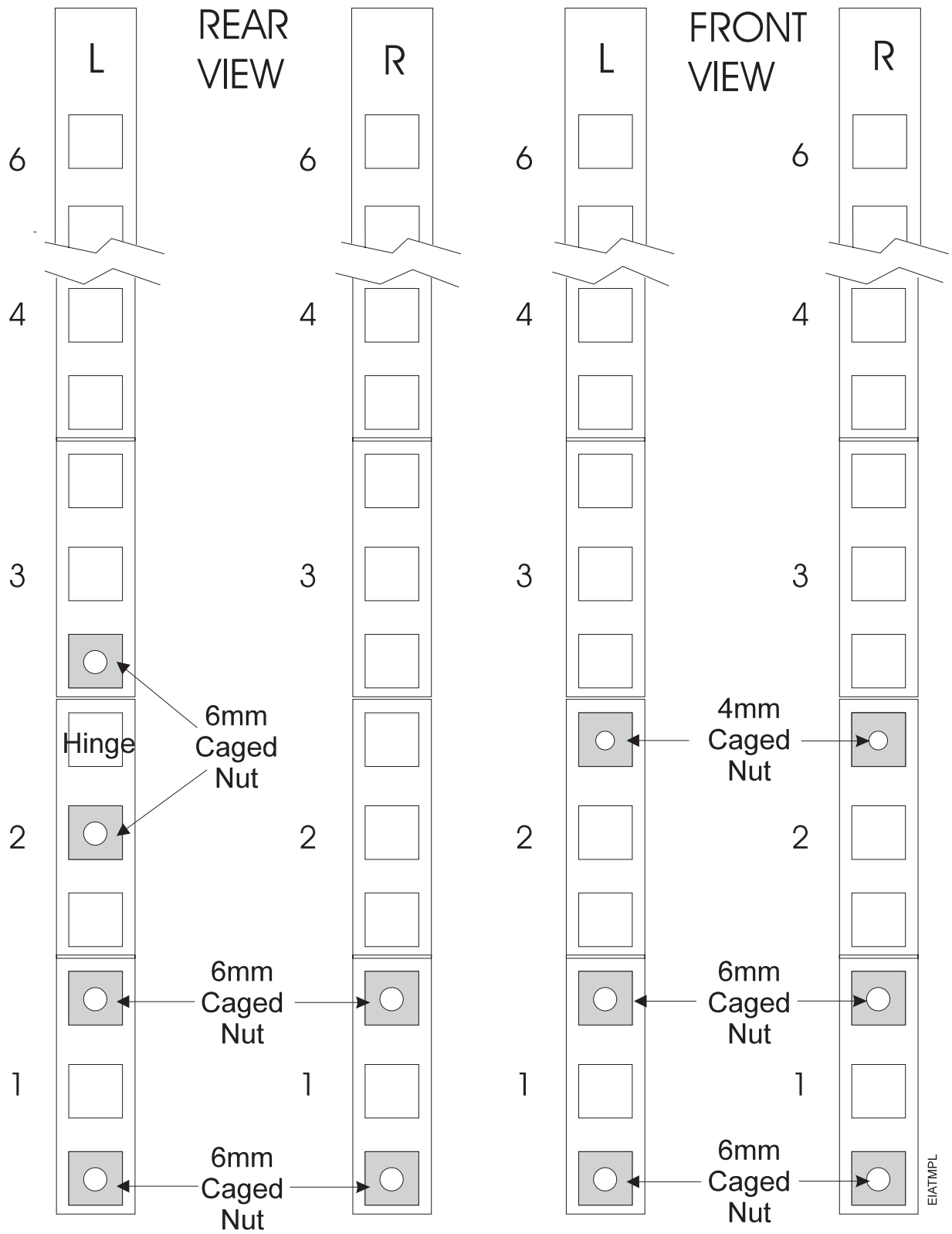
The IBM Magstar MP 3590 Tape library Models B21 and B22 are designed only for installation in the IBM Netfinity Rack (9306900) or NetBAY22 (9306200) rack. They can be attached to IBM Netfinity 5500 or 7000 and IBM PC Server 325 or 330 systems that support attachment with an included adapter card.

When you are installing a Model B21 or Model B22 in a rack, you are instructed to locate components by Electronic Industry Association (EIA) rack unit and hole location. An EIA unit takes up three holes. See Figure 222 on page INST-36 for an example. All hole locations are specified within contiguous EIA rack units, and are square shaped in both racks.

1. Figure 220 lists the parts necessary for the rack mount installation. Ensure that you have the necessary hardware to begin the installation.

Figure 220. Model B21 and B22 Rack Mounted Hardware List

Package Bill Number	Part Number	Quantity	Description
08L6489			
	08L6502	3	Nut, M4 Caged
	08L6557	1	Wrench kit, hex M3/M4
	12J5288	11	Nut, M6 caged
	1621510	3	Screw, M4 X 10 Socket Button-head
	1621950	11	Screw, M6 X 12 Socket Button-head
08L6255			
	05H2629	1	Strain Relief Clamp
	05H9208	1	Cable arm Assembly
	08L6495	1	Cable basket (SCSI Z shaped)
	08L6501	1	Cable Arm hinge
	1159519	12	Tie, adjust strap
	1621465	2	Screw, M5 X 8 sockethead
	1621519	2	Screw, M5 X 12, SCSI cable clamp
	1624778	6	Screw, M5 X 12, (Included but not used; scrap locally)
	74F1823	3	Nutclip, M5 (Included but not used; scrap locally)
08L6488			
	08L6499	1	Slide, left & right pair
	08L6500	1	Slide tray
	1621191	6	Screw, M4 X 10 Pan head
	1621309	6	Screw, M4 X 10 Flat head
	1622403	6	Lock Nut, M4
<b>Note:</b> Actual part numbers and quantities may change. Rely on the shipping list for actual part numbers and quantities. Some parts may have extra parts included.			



| Figure 221. EIA Rack Template for Models B21 and B22

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2. Position the rack in the area of the customer's location where it will be installed.
3. Locate the physical area in the rack (which EIA units the drive will occupy).

**Note:** Because of the weight of the 3570, it is recommended that the 3570 be installed as low as possible in the rack. Never install the drive so that the top of the 3570 is higher than EIA unit 28 in the Netfinity Rack (9306900). There are no height restrictions in the NetBAY22 (9306200) rack.

The 3570 requires six EIA units on each side. Each EIA unit consists of three holes in the rack. The supporting slides must be installed level in the rack. Figure 222 on page INST-36 and Figure 223 on page INST-37 show the locations of the holes used.

4. It is necessary to remove the front door of the Netfinity rack to install the slide assemblies. This is done by removing the hinge pins that hold the door to the frame.

**Caution**

Removal of the Netfinity rack door requires two people. One to hold the door while the other removes the hinge pins. It is suggested that you remove the top hinge pin **last**.

## Installing Supporting Slides and Tray in Rack

When installing the library models in a rack, six EIA rack units must be available. Make a copy of the template Figure 221 on page INST-33. Use this template to assist you in the following steps.

1. Determine which rack location the 3570 will be installed in. Count and mark the six EIA units on the left and right sides of the front and the rear of the rack.
2. Refer to Figure 222 on page INST-36 and install the four M6 caged nuts 1, P/N 12J5288 and four M6 X 12 socket button head screws, 2, P/N 1621950, in the bottom EIA units on the left side, as shown. Leave the screws loose enough to insert the slide mounting brackets 3 between the screw heads and the EIA strips.
3. Read the notes below before continuing.

**Notes:**

- a. Ensure that the slide is oriented so that when the inner slide is extended out, it extends toward the front of the rack.
  - b. You will need an adjustable wrench to loosen the nuts holding the rear slide bracket to adjust it to the width of the EIA units. The bracket fingers must go outside the EIA strips (the opposite side of where the captive nuts are installed) for both the front and rear mounting points.
  - c. Do all of the adjustment with the rear mounting bracket. **DO NOT** loosen the front mounting bracket screws.
4. Next, fit the left-hand slide assembly 4 as shown in Figure 222 on page INST-36. Ensure that the front and rear brackets 3 are flush to the EIA strips 5 on the opposite sides of where the captured nuts 1 are installed. Tighten the nuts that hold the rear slide bracket.
  5. Remove the left-hand slide assembly 4 and use that assembly to measure and adjust the right-hand slide assembly that is attached to the tray assembly.

**Notes:**

a. Remember to make adjustments only on the rear slide bracket assembly. **DO NOT** loosen the front slide bracket.

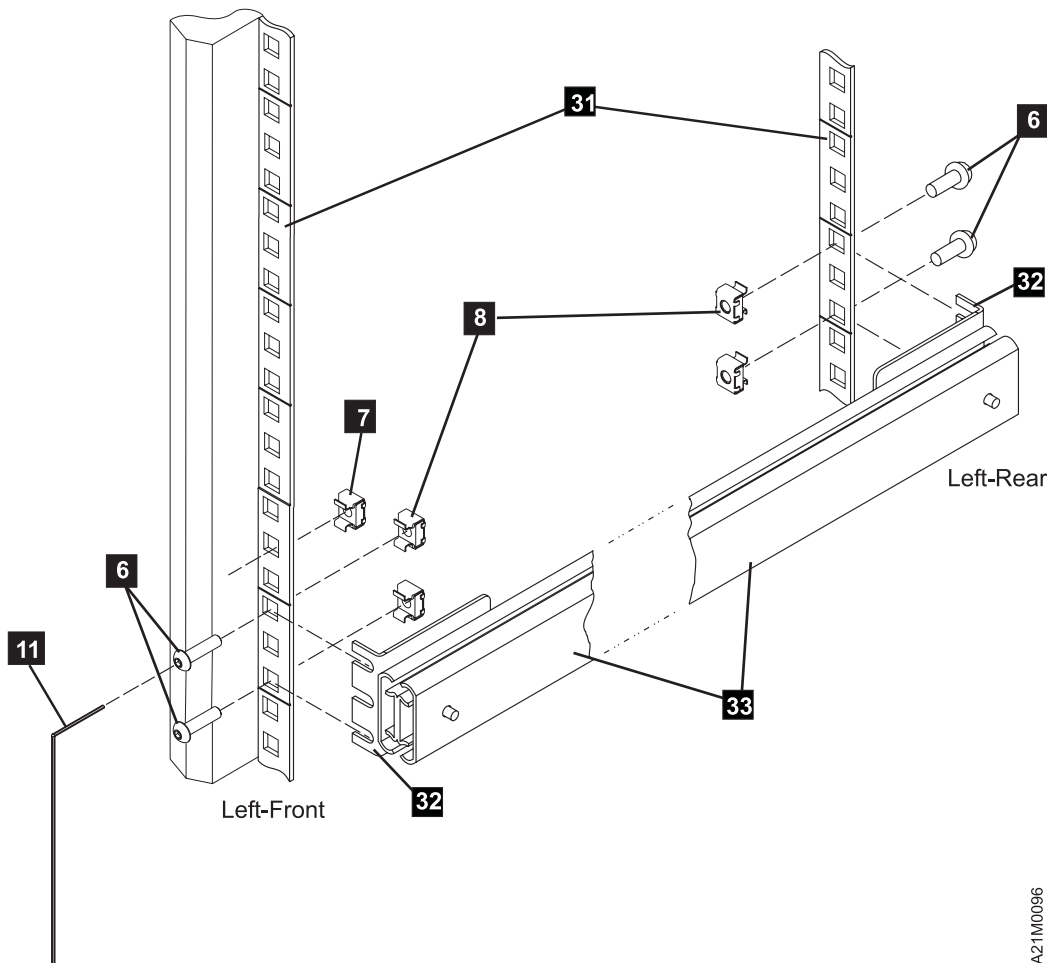
b. Ensure that when the inner slide is extended out, it extends toward the front of the rack.

The two slides should both be the same length. Tighten the nuts holding the right rear slide bracket and set that assembly aside for now.

6. Re-install the left-hand slide assembly as shown in Figure 222. Tighten the four screws 2 .

**Note:** Be sure that these brackets are tightened securely using the special hex wrenches provided.

7. Install a caged M6 nut, P/N 12J5288, 7 in the top hole of the first EIA unit above the left slide and another M6 nut in the top hole of the first EIA unit above the right slide. Refer to Figure 222 and Figure 223 on page INST-37 for the location. Another view can be seen in Figure 217 on page INST-29. You will install M6 X 12 socket button-head screw, P/N 1621950 later, in step 9 on page INST-66.



A21M0096

Figure 222. Attaching Left-hand Slide and Bracket assembly



8. Refer to Figure 223 and install the right-hand slide and tray assembly 4 as follows:

- a. Install the four M6 caged nuts 8, P/N 12J5288 and four M6 X 12 socket button head screws, 6, P/N 1621950, in the bottom EIA units on the right side, as shown. Leave the screws loose enough to insert the slide mounting brackets 32 between the screw heads and the EIA strips.

**Note:** The right-hand slide bracket should have been adjusted in a previous step. If a fine adjustment is needed, make all the adjustments at the rear bracket. The bracket fingers must go outside the EIA strips (the opposite side of where the captive nuts are installed) for both the front and rear mounting points.

- b. Raise the left side of the slide and tray assembly so the tray is tilted to the right.

**Notes:**

- 1) Ensure that the four drive mounting tabs 34 are pointing up.
- 2) The square hole in the center of the tray can be used as a hand hold while tilting and installing the slide/tray assembly.

- c. Insert the right-hand slide and tray assembly, 35 into the rack above the left-hand slide assembly installed earlier. Ensure that the rear brackets, 32 are inserted between the EIA strips 31 and the M6 X 12 socket button-head screws 6 that were left loose in an earlier step. The bracket fingers should reside on the opposite sides of the EIA strip 31 from the captured nuts 8.

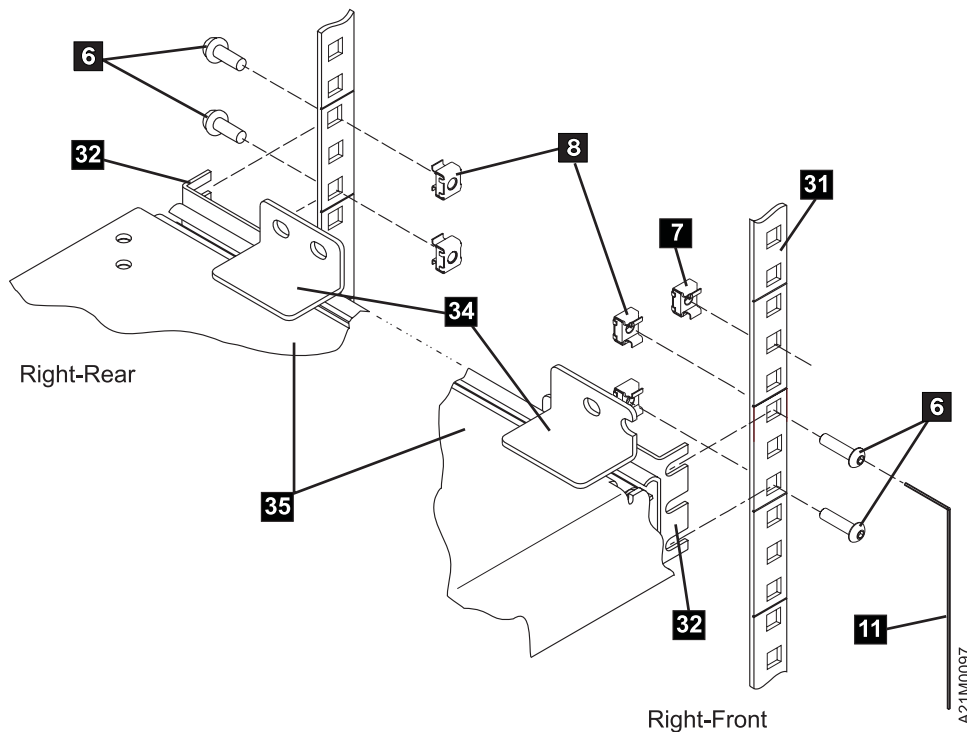


Figure 223. Attaching Right-hand Slide, Bracket and Tray assembly

- \_\_\_ d. See Figure 224. Lower the left side of the tray down so the tabs on the tray 34 set on the top of the left-hand slide assembly 36. The brackets on the right-hand side should slide all the way under the captured nuts.
- \_\_\_ e. Tighten the screws 6 shown on Figure 223 on page INST-37.

**Note:** Be sure that these brackets are tightened securely using the special hex wrenches provided.

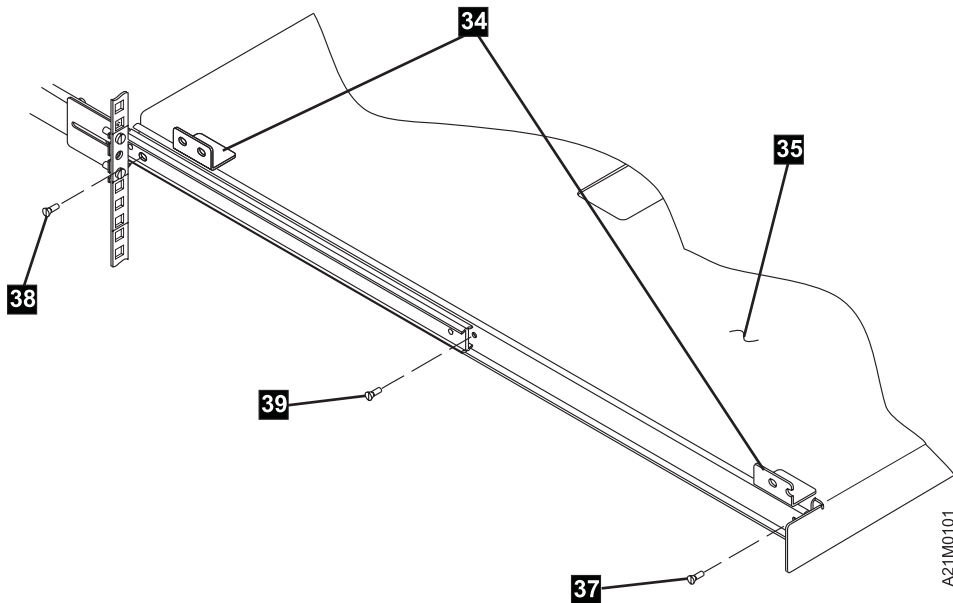


Figure 224. Attaching Tray to Left-hand Slide

- \_\_\_ 9. Referring again to Figure 224, pull the tray and slides all the way out toward the front of the rack and lock the slides in place.

**Notes:**

- a. The next steps will require you to slide the tray in and out, and lift the left side of the tray slightly in order to align the left slide **clearance** holes with the tray's **threaded** holes. This alignment will be easier if you first install the front screw 37 (tray pulled out all the way), then the rear screw, 38 and finally the middle screw 39 (with the tray partially pushed in).
- b. Install the middle screw 39 by pushing the tray toward the rear until the threaded screw hole appears.

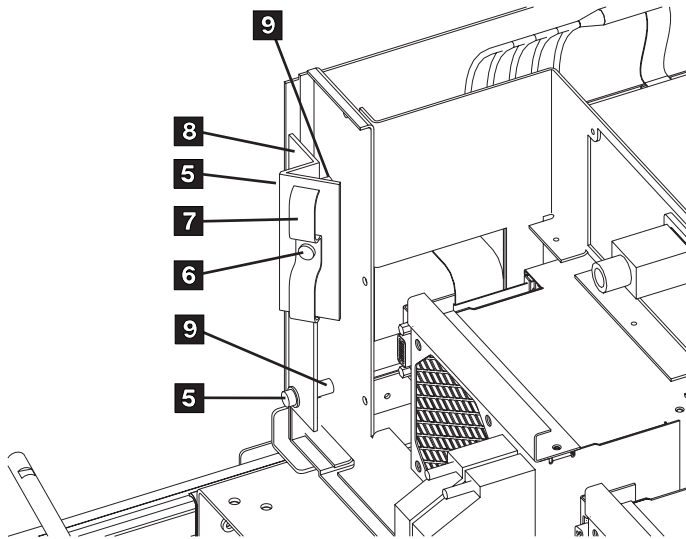
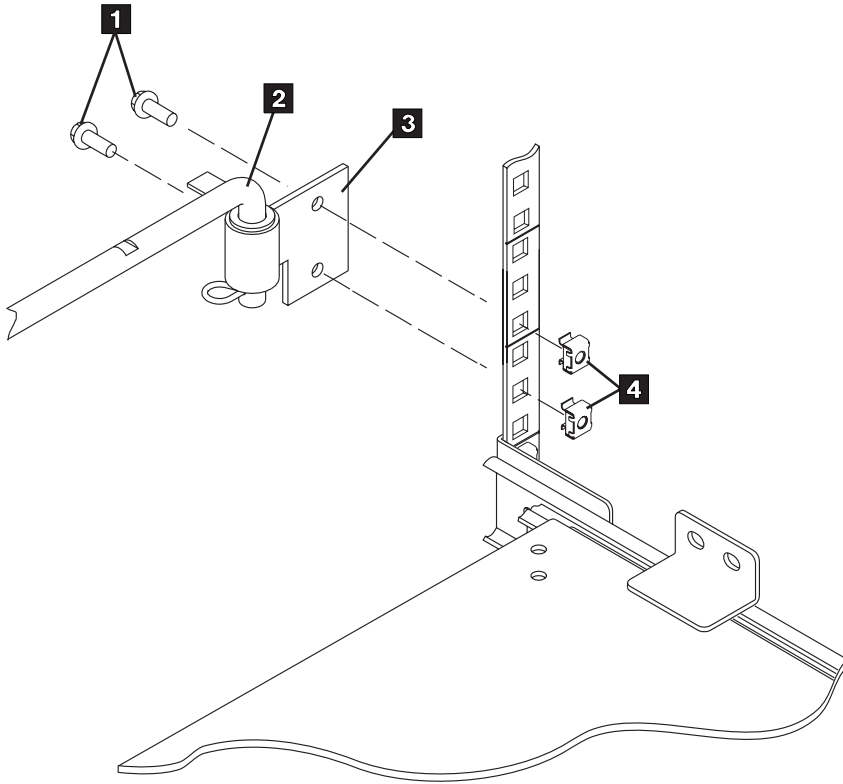
- \_\_\_ 10. Raise the left-hand side of the tray enough to align the holes in the slide with the mounting holes in the tray. Attach the left-hand slide to the tray using three M4 x 10 socket button head screws 37, 38 and 39 P/N 1621510. Ensure that the screws are tight.

- \_\_\_ 11. Install three lock nuts, P/N 1622403, on the threads of the three screws just installed. This will ensure that none of the screws come loose during usage.

- \_\_\_ 12. See Figure 222 on page INST-36 and Figure 223 on page INST-37. Pull the tray assembly out so the slides are extended all the way out.

- | \_\_\_ 13. Refer to Figure 222 on page INST-36 and Figure 223 on page INST-37. Ensure that all of the M6 X 12 socket button head screws, 6 , holding the slides to the rack are tight.
- | \_\_\_ 14. Refer to Figure 225 on page INST-40. Install the cable arm hinge 3 , P/N 08L6501, using two socket button head screws, 1 , P/N 1621950, and two M6 caged nuts 4 , P/N 12J5288. The cable arm hinge should be installed in the EIA unit just above the right rear slide mounting position, as you face the rack from the front.
- | **Note:** Move the hinge bracket up **one hole** from the bottom of the EIA unit. The EIA unit holes are not all equally spaced from each other.
- | \_\_\_ 15. Refer to Figure 225 on page INST-40 and install the articulating arm assembly 2 , P/N 05H9208, in the hinge as shown if not pre-assembled. If there is a washer on the cable arm assembly, it should be installed on the bottom, just above the retaining pin.
- | \_\_\_ 16. See Figure 225 on page INST-40. Install the cable strain relief bracket 8 , P/N 08L6495, using two M5 x 8 socket head screws, 5 , P/N 1621465, at the standoffs, item 9 at the rear of the drive as shown.
- | \_\_\_ 17. Install the strain relief clamp 7 , P/N 05H2629 on the strain relief bracket with one M5 X 12 SCSI cable clamp screw, 6 , P/N 1621519. Leave the screw loose at this time. The cables will be routed through the clamp in a later step.





A21M0103

| Figure 225. Attaching Cable Arm and Strain Relief Bracket

## Installing the 3570 in a Netfinity 7000 Rack

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

### C2

#### CAUTION:

The 3570 Model B21 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.

### C4

#### CAUTION:

The 3570 Model B22 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.

**Note:** This notice is translated into selected languages. See **C2** and **C4** in the INSP section.

1. See Figure 226 on page INST-42. Remove the four corner screws 1 from the drive. These will be used to attach the drive to the tray in a later step.
2. You must have assistance to lift the 3570, go to step 3.

Library Models Only

3. Extend the slide and tray assembly 2 all the way out. Ensure that the slide tray assembly is **locked in the extended position**.

### C5

#### CAUTION:

When you are sliding the 3570 drive tray assembly in or out, make sure you do not get your hand caught between the drive and the rack. Also, when you are servicing the 3570, make sure the slide and tray assembly is fully extended and locked.

**Note:** This notice is translated into selected languages. See **C5** in the INSP section.

End of Library Models Only

Library Models Only

4. Lift the 3570, with assistance, and set it on the tray. Ensure that the screw holes in the 3570 align with the holes in the mounting tabs on the tray.

End of Library Models Only

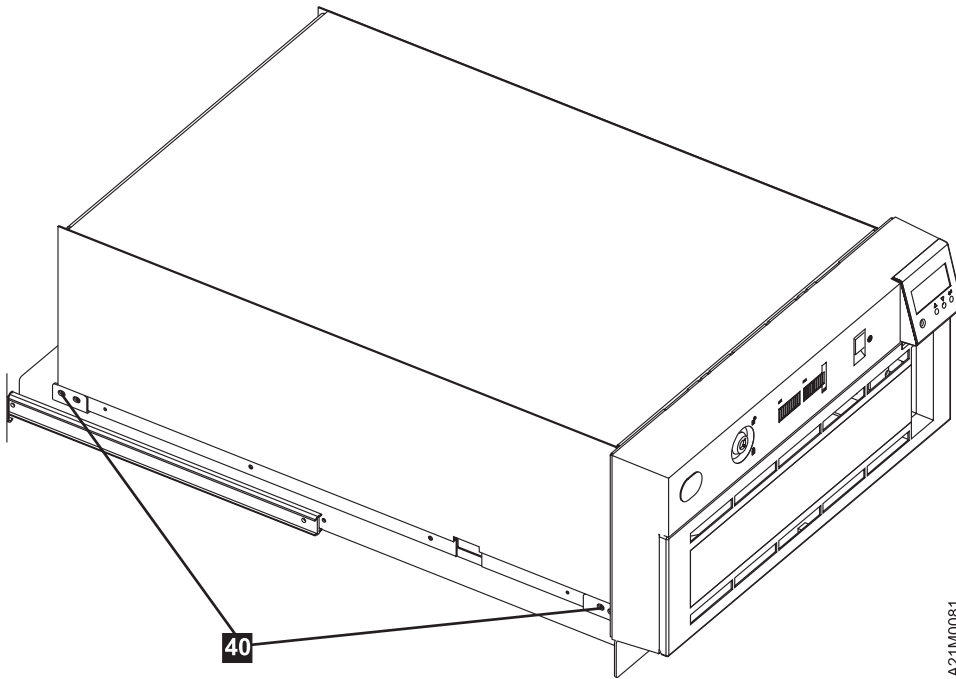
Library Models Only

5. Continue with step 6 on page INST-42.

End of Library Models Only



6. See Figure 226 on page INST-42. Fasten the four mounting tabs on the tray 1 to the four corners of the 3570 with the four screws that were removed in step 1. Make sure that the mount tabs in the tray are on the outside. On the mount tabs, use the mounting holes closest to the rear of the machine.



A21M0081

Figure 226. Attaching the 3570 to the Rack Tray

**Note:** The Model B11 or B12 is shown, but these screw locations are similar for all models.

7. Move the tray and slide assembly into and out of the rack several times to ensure that the slides operate without binding.
8. Re-install the rack door which was removed earlier.
9. Ensure that the rack door will close without hitting the 3570.

## Installation Checkout—Library Models

Before turning on power, the orange stopper shown in Figure 227 must be removed from the unit. The stopper is pressed on the rail to prevent the picker from moving during shipping. To remove the stopper:

- \_\_\_ 1. Unlock the library front door if necessary. The keys are taped to the rear of the unit. See 12 on page INST-3 for more information about the keys, if necessary.
- \_\_\_ 2. Look inside the unit and find the orange tag, item 2 that is attached to the stopper, item 1. The orange tag will assist you in finding the orange stopper.
- \_\_\_ 3. **Do not pull on the string or the tag to remove the stopper.** Reach inside the unit and remove the orange stopper from the rail using your fingers. Remove the stopper, string and tag.

**Note:** Save the stopper with the packaging material for later reshipment or relocation.

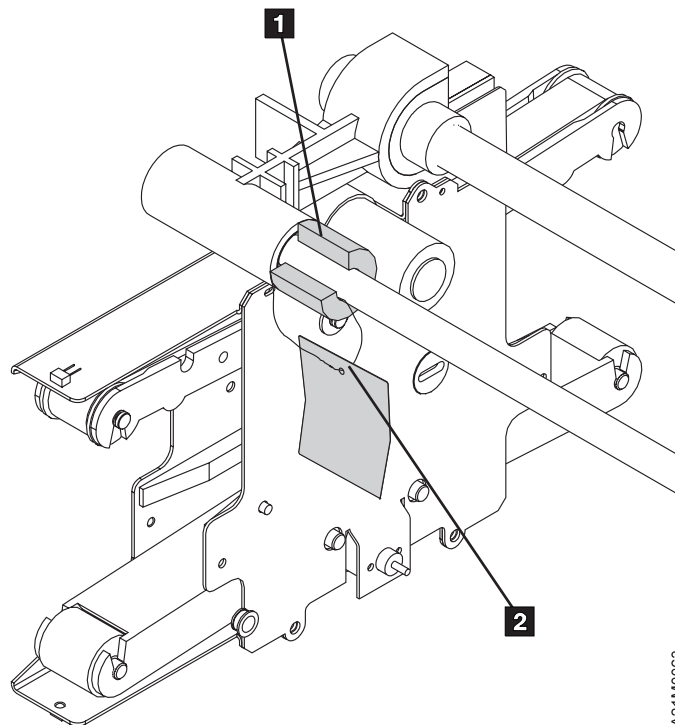


Figure 227. Stopper and Orange Tag

- \_\_\_ 4. Install any magazines and close the library front door.
- \_\_\_ 5. If this machine is a Model B01 or Model B02, remove the rear cover from the library. The cover is attached using snap-in plastic retainers. Rotate the plastic retainers one-quarter turn in either direction to release the cover.
- \_\_\_ 6. If not done by the factory, install the RS-422 jumper cable P/N 65F5399 between drive 1 and drive 2 RS-422 connectors in the rear of the drive units. Some models may ship with this cable uninstalled. The DU0 end of the cable goes to drive 1, and the DU1 end goes to drive 2.
- \_\_\_ 7. Install the power cable in the 3570 and plug it into its power source.

**Note:** Two power cables are required for Models B02 and B12 and B22.

- \_\_\_ 8. A SCSI Wrap Tool, P/N 05H9163, is not part of the ship group but is available through the service branch. If you have this tool available, perform “SCSI Port Wrap Test” on page PROC-84 on all the tape drives. If the tool is not available, continue with the next step.

- \_\_\_ 9. Power on the device.
- \_\_\_ 10. Go to “Operator Panel Setup and Tests—Library Models.”

## Operator Panel Setup and Tests—Library Models

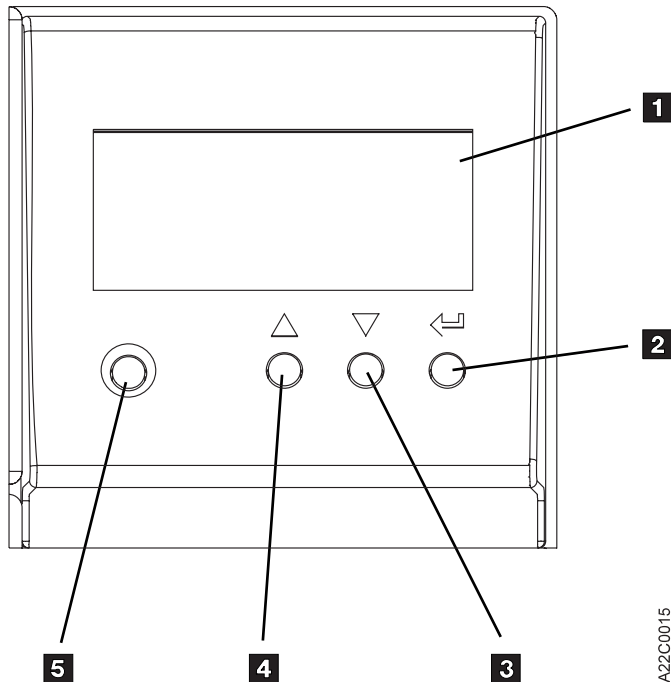


Figure 228. Operator Panel, Library Models

When the instructions for using the panel use the term *select*, use the **arrow** push buttons to move the cursor to the selection, then press **Enter**.

Pressing **Change Mode** selects either the *operator* Options menu or the *CE* Options menu.

If the power-on diagnostics detect a problem, a FRU identifier (FID) is posted in the operator panel. If an error occurs, note the FID and go to the START section.

See “Operator Panel Overview” on page PANEL-3 for details about the operator panel and the meaning of the menu options.

### Check EC Level—Library Models

- \_\_\_ 1. When the power-on diagnostics complete successfully, press Enter.
- \_\_\_ 2. From the operator Options menu, select **Services**.
- \_\_\_ 3. If asked to select a drive, select Drive 1.
- \_\_\_ 4. From the Services menu, select **Microcode Level**.
- \_\_\_ 5. Record the EC level and link level in “Microcode EC Level History Log” on page PROC-47.
- \_\_\_ 6. Select Cancel repeatedly until you return to the Main menu.



## Set Drive Options—Library Models

- \_\_\_ 1. Press the Change Mode push button to place the 3570 in CE mode.
- \_\_\_ 2. Select **Drive 1** and press ENTER.
- \_\_\_ 3. Select **Config/Install** from the CE Options Menu.
- \_\_\_ 4. Select **Drv Features** from the Config/Install Menu.
- \_\_\_ 5. Select one of the following (an \* shows which model is currently selected):
  - \_\_\_ a. Select **B11 Rack** if you are installing a 3570 model B11 or B21. The host will see a Model B21 as a Model B11. The B21 emulates the B11.
  - \_\_\_ b. Select **B12 Rack** if you are installing a 3570 model B12 or B22. The host will see a Model B22 as a Model B12. The B22 emulates the B12.
  - \_\_\_ c. Select **B01 Standalone** if you are installing a 3570 model B01.
  - \_\_\_ d. Select **B02 Standalone** if you are installing a 3570 model B02.
- \_\_\_ 6. Select **Yes** from the CE Save Data Menu, if you changed the model; otherwise select **Cancel**.
- \_\_\_ 7. If you are not changing the SIM sensitivity, skip the following steps, and go to “Run Tests—Library Models.”
- \_\_\_ 8. Select whether to filter the messages displayed on the panel. The default is **off**. See **SIM Sv Filt On/Off** in the Figure 149 on page PANEL-41.
- \_\_\_ 9. Select **Cancel** to return to the Main menu.
- \_\_\_ 10. Switch power off and back on to activate the changes.

## Run Tests—Library Models

- \_\_\_ 1. Perform “CE Verify Fix on Library Models” on page PROC-13 and return here.

**Note:** The Read/Write test that is part of the CE Verify Fix takes three minutes to run to completion for each drive that is being installed.
- \_\_\_ 2. Go to “Setting the SCSI Address and Configuring the Library” on page INST-46.



---

## SCSI ATTACHMENT

### Setting the SCSI Address and Configuring the Library

The settings and configuration information selected in this procedure are saved in non-volatile memory and become the default settings after subsequent power-on cycles.

This section describes how to:

Select the language used by the menus at step 2.

Load the cleaning cartridge as defined in step 3.

Select the library configuration from the following list at step 4, then

Set the SCSI address(es) in step 8 for Models B02, B12 and B22, and in step 10 on page INST-47 for Models B01, B11 and B22.

Select the library mode of operation at step 20 on page INST-47 for Models B02, B12 and B22, and in step 32 on page INST-48 for Models B01, B11 and B22.

Perform the following steps in the order indicated:

- \_\_\_ 1. At power on, the Status screen will be displayed (see Figure 229 on page INST-48). Press the Enter button to display the **Options Menu**.
- \_\_\_ 2. If a language for the menus other than English is desired, select SERVICES from the **Options Menu** and press enter. Then select CHANGE LANG and press enter. When the **Change Language Menu** appears, select English, Spanish, or German for the menus on the operator screen and press Enter.
- \_\_\_ 3. Select CLEAN from the **Options Menu**. When the **Clean Menu** appears, select INSERT CLN TAPE. If there is not a cleaning cartridge in the Priority Cell, a message will appear prompting the operator to PUT CLEANING CARTRIDGE IN PRIORITY CELL PRESS ENTER. After a cleaning cartridge is put in the Priority Cell and the Enter button is pressed, the cleaning cartridge will be loaded into the 3570 and stored in the internal cleaning cartridge storage cell. Select CANCEL and press Enter to return to the **Options Menu**.
- \_\_\_ 4. Select EDIT CONFIG from the **Options Menu** and press Enter.
- \_\_\_ 5. If a 3570 Tape Subsystem Model B01, B11 or B21 is being installed, go to step 10 on page INST-47.
- \_\_\_ 6. Select SET LIBR CONFIG from the **Edit Configuration Menu** and press Enter.
- \_\_\_ 7. An asterisk (\*) in front of BASE or SPLIT indicates the configuration that is currently selected. To keep the current configuration, select CANCEL and press Enter. To change the configuration, move the arrow to select the desired configuration (BASE or SPLIT) and press Enter. Set the configuration as instructed by the customer. After making your choice, select CANCEL and press ENTER to return to the **Edit Configuration Menu**. See "Set Library Configuration Menu" on page PANEL-16 for an explanation of the configurations.
- \_\_\_ 8. Select ADDRESS DRV2 from the **Edit Configuration Menu** and press Enter.
- \_\_\_ 9. Select the SCSI address for tape drive 2 and press Enter. After making your choice, select CANCEL and press ENTER to return to the **Edit Configuration Menu**.

**Notes:**

- a. Select the SCSI address previously recorded by following the instructions and checklist in “Before You Begin” on page INST-5.
- b. Remember, in a dual drive model, the SCSI addresses for the two drives **must be unique** if both drives are attached to the same host initiator. If the drives will be attached to different host initiators, the SCSI addresses may be either unique or the same.

- \_\_\_ 10. Select ADDRESS DRV1 from the **Edit Configuration Menu** and press Enter.
- \_\_\_ 11. Select the SCSI address for tape drive 1 and press Enter. For connection to AS/400 systems, SCSI address 0 is recommended. After making your choice, select CANCEL and press ENTER to return to the **Edit Configuration Menu**.

**Note:** Select the SCSI address previously recorded by following the instructions and checklist in “Before You Begin” on page INST-5.

- \_\_\_ 12. Select AUTO CLEAN from the **Edit Configuration Menu** and press Enter.
- \_\_\_ 13. An asterisk (\*) in front of ENABLE or DISABLE indicates if automatic cleaning is enabled or disabled. The default setting is \*ENABLE. If the display shows \*ENABLE, the library unit will automatically clean the tape drive(s) when they require cleaning. If the display shows \*DISABLE, the operator must take action to clean the tape drive(s) when cleaning is required.

To keep the current configuration, select CANCEL and press Enter. To change the configuration, move the arrow to select the desired configuration (ENABLE or DISABLE) and press Enter. After making your choice, select CANCEL and press ENTER to return to the **Edit Configuration Menu**.

- \_\_\_ 14. Select CANCEL from the **Edit Configuration Menu** and press Enter.
- \_\_\_ 15. If a 3570 Tape Subsystem Model B01, B11 or B21 is being installed, go to step 29 on page INST-48.
- \_\_\_ 16. If \*UNLOAD DRIVE is displayed, there is no cartridge in the drive. If UNLOAD DRIVE (without an asterisk) is displayed, there is a cartridge in the drive. The UNLOAD DRIVE option on line 3 pertains to drive 1 and the UNLOAD DRIVE on line 4 pertains to drive 2.

If a cartridge is loaded in drive 1 or drive 2, select UNLOAD DRIVE from the **Unload and Reset Menu** and press Enter; otherwise continue with step 19.

- \_\_\_ 17. The cartridge will be unloaded from the drive and the status screen will be displayed. Press Enter to return to the **Drive Selection Menu**.
- \_\_\_ 18. Repeat step 17 until there are no cartridges loaded in drive 1 or drive 2.
- \_\_\_ 19. Select RESET DRIVE and press Enter, then select PROCEED and press Enter.
- \_\_\_ 20. The 3570 will reset, run power-on diagnostics, and check the magazine cells to determine if cartridges are present. The reset is complete when all movement in the library has stopped and the hour-glass symbols for each of the magazine cells has been replaced with a solid block, an open block, or a dash. When the reset is complete, press Enter to return to the **Options Menu**.
- \_\_\_ 21. Select SET LIBR MODE from the **Options Menu** and press Enter.
- \_\_\_ 22. Select DRIVE 1 and press Enter.
- \_\_\_ 23. See “Library Modes of Operation” on page LIBRARY-5.

**Note:** If the 3570 is configured to operate in Base Configuration, it is recommended to select the Random Mode of operation. Drive 2 is not used when the 3570 is set in Base Configuration and Manual or Automatic Mode of operation.

Select the desired mode of operation (MANUAL, AUTOMATIC, or RANDOM) for tape drive 1 and press Enter.

- \_\_\_ 24. If the 3570 is configured to operate in Base Configuration, continue with step 27 on page INST-48.
- \_\_\_ 25. Select DRIVE 2 and press Enter.
- \_\_\_ 26. Select the customer's desired mode of operation (MANUAL, AUTOMATIC, or RANDOM) for tape drive 2 and press Enter.
- \_\_\_ 27. Select CANCEL and press Enter until the **Options Menu** is reached.
- \_\_\_ 28. Continue at step 35.
- \_\_\_ 29. If \*UNLOAD DRIVE is displayed, there is no cartridge in the drive. If UNLOAD DRIVE (without an asterisk) is displayed, there is a cartridge in the drive. If a cartridge is loaded in the tape drive, select UNLOAD DRIVE from the **Unload and Reset Menu** and press Enter; otherwise continue with step 31.
- \_\_\_ 30. The cartridge will be unloaded from the drive and the status screen will be displayed. Press Enter to return to the **Unload and Reset Menu**.
- \_\_\_ 31. Select RESET DRIVE and press Enter, then select PROCEED and press Enter.
- \_\_\_ 32. The 3570 will reset, run power-on diagnostics, and check the magazine cells to determine if cartridges are present. The reset is complete when all movement in the library has stopped and the hour-glass symbols for each of the magazine cells has been replaced with a solid block, an open block, or a dash. When the reset is complete, press Enter to return to the **Options Menu**.
- \_\_\_ 33. Select SET LIBR MODE from the **Options Menu** and press Enter.
- \_\_\_ 34. Select the customer's desired mode of operation (MANUAL, AUTOMATIC, or RANDOM) and press Enter. (For additional information, see "Library Modes of Operation" on page LIBRARY-5.)
- \_\_\_ 35. Press the Power switch (see 1 in Figure 48 on page INTRO-44) to the Off position.
- \_\_\_ 36. Proceed with Host (Initiator) Connection.

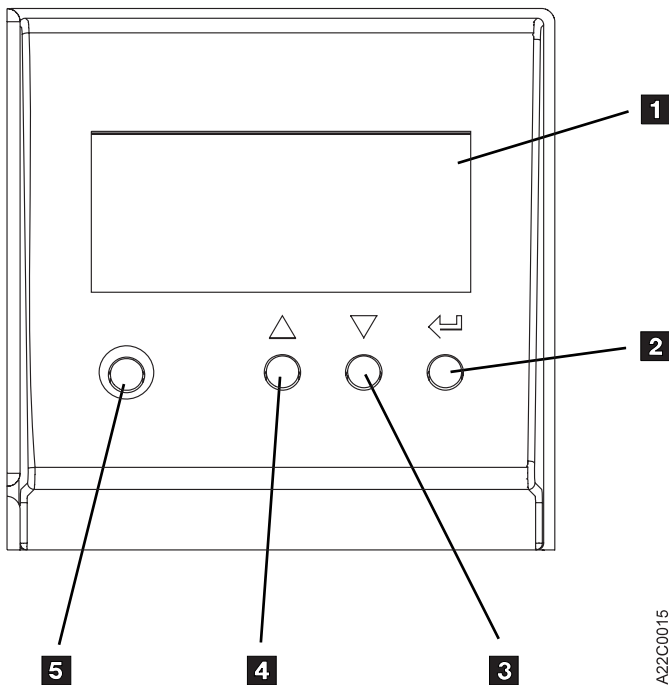


Figure 229. Buttons Used to Make Selections from the Operator Menus

- 1 Liquid Crystal Display Screen
- 2 Enter Button

- 3 Scroll Down Button
- 4 Scroll Up Button
- 5 Menu Mode Button

For a detailed description, see “Library Operator Panel” on page INTRO-42.

---

## Host (Initiator) Connection

**Attention:**The host (initiator) SCSI port must be quiesced (varied off-line) before removing any SCSI device.

For AS/400 systems, only one SCSI device is permitted per SCSI initiator, and an AS/400 system cannot be interconnected with any other system (including another AS/400 system) on the same SCSI bus.

If the 3570 is to be attached to a 6501 feature and used as an alternate IPL device, the bottom port of the 6501 must be used.

- \_\_\_ 1. An interposer may be required at the initiator end of the SCSI cable (see Figure 231 on page INST-50 and Figure 232 on page INST-50). If so, install the appropriate interposer at the initiator (the host port where SCSI cable will be attached). Be sure to attach the interposer securely before attaching the SCSI cable to the interposer.

See Figure 230 for SCSI cable feature codes. See Figure 231 for SCSI cable connections to the host.

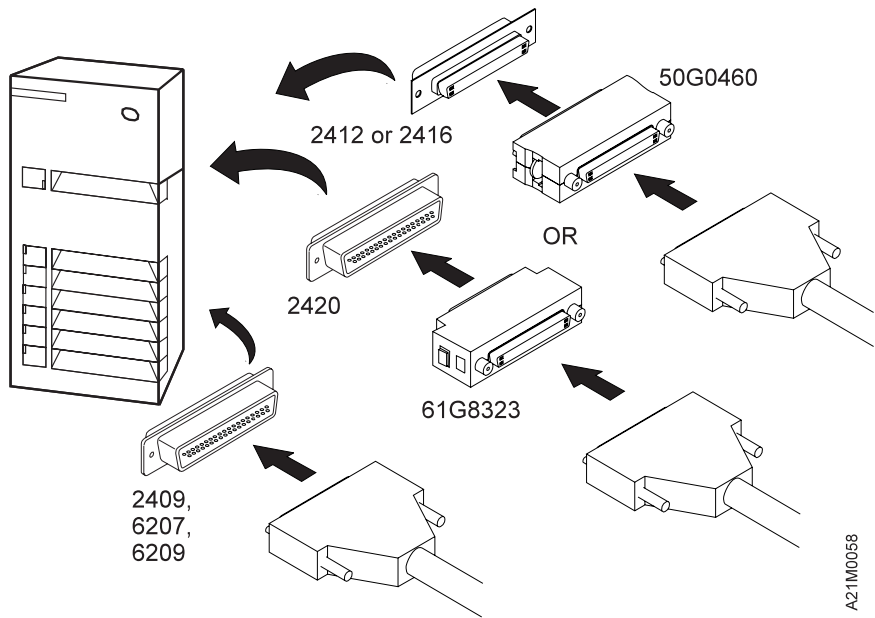
- \_\_\_ 2. For installation of Model B01, B11 or B21 continue with “Model B01, B11 and B21 Connections” on page INST-51.
- \_\_\_ 3. For installation of Model B02, B12, or B22 continue with “Model B02, B12 and B22 Connections” on page INST-54.



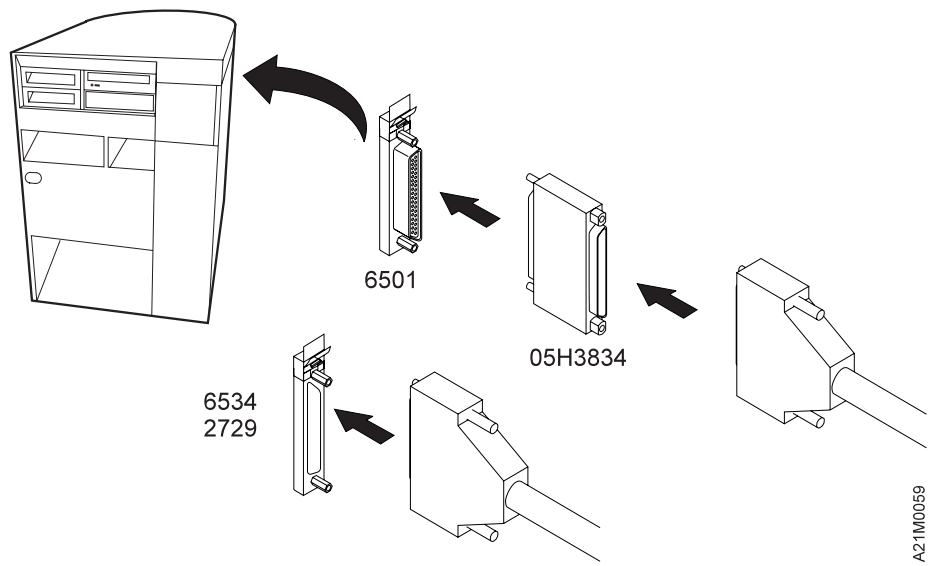
*Figure 230. SCSI Cable Feature Codes*

Magstar MP 3570 Feature Code and P/N	Cable Length
FC 5205 (P/N 49G6456)	0.5 m (2 ft) (SCSI Bus Jumper)
FC 5212 (P/N 49G6458)	12 m (39 ft)
FC 5218 (P/N 49G6459)	18 m (59 ft)
FC 5245 (P/N 49G6457)	4.5 m (15 ft)
None (P/N 05H9527, Models B21 and B22)	0.5 m (2 ft) (SCSI Bus Jumper)
None (P/N 05H9651, Models B21 and B22)	4.5 m (15 ft)

**Note:** Cable lengths greater than 18 m (59 ft) cannot be used with RS/6000 controller FC 2420. Cable lengths up to 25 m (81 ft) can be used with RS/6000 controller FC 2409, 2412, 2416, 6209.



*Figure 231. Installing the SCSI System Cable at the RS/6000 Host (Initiator)*



*Figure 232. Installing the SCSI System Cable at the AS/400 Host (Initiator)*

## Sun Systems Attachment

All 3570 models can be installed on all Sun workstations that support a SCSI-2 differential ended adapter.

For Sun systems, SunOS 5.x (Solaris 2 or higher) is required to support the 3570 models. The Sun Device Driver provides specific Sun device support and is included in the ship group. ADSM for Sun Solaris 1.2.1 with PTFs also supports the 3570. No interposers are required when attaching to these systems.

Figure 230 on page INST-50 shows the cable feature codes for the cable of the appropriate length.

## HP-UX Systems Attachment

The 3570 models are supported on Hewlett— Packard (HP) 9000 Series 800 Business Servers. They are also supported in other HP-PB based servers which support a SCSI Fast/Wide Differential adapter including:

HP9000 Series /T Class Server (T500, T520, T600)

HP9000 Series /K Class Server (K4xx, K2xx)

HP9000 Series /D Class Server (D3xx, D2xx)

The Models B11 and B12 require installation in a support rack or space in an existing customer rack (one Bxx unit per 6 EIA positions). The maximum SCSI cable length is 25 meters. See Figure 230 on page INST-50 and the Introduction and Planning Guide (GA32-0392) for additional SCSI cable planning information.

HP-UX 10.0x supports the IBM3570 models through HP-UX 10.3x. The device drivers are included in the ship group. No interposers are required with these attachments.

Figure 230 on page INST-50 shows the cable feature codes for the cable of the appropriate length.

## Windows NT Systems

The 3570 models are supported in Intel based processors. These include Intel 486DX or Pentium\* processor with sufficient RAM and disk space for operation of Microsoft's Windows NT operating system. An appropriate SCSI F/W Differential adapter and associated cable is also required. Models B21 and B22 are specifically designed to be installed into the IBM Netfinity Rack (9306900) or NetBAY22 (9306200) rack. They can be attached to IBM Netfinity 5500 or 7000 PC Server 325 or 330 systems that support attachment with an included adapter card. A 4.5 meter SCSI cable is included for these attachments. The maximum SCSI cable length is 25 meters. See Figure 230 on page INST-50 and the Introduction and Planning Guide (GA32-0392) for additional SCSI cable planning information.

Microsoft's Windows NT Server Version 4.0, and later releases, support the IBM 3570. The Windows NT Device Drivers are included in the ship group. No interposers are required for these attachments.

Figure 230 on page INST-50 shows the cable feature codes for the cable of the appropriate length.

## Model B01, B11 and B21 Connections

Refer to Figure 234 on page INST-53 for typical SCSI cabling diagrams while performing the following steps.

1. If this machine is a Model B01, remove the back cover plate from the library. The cover is attached using plastic snap-in retainers. Rotate the plastic retainers one-quarter turn in either direction to release the cover.

- 2. If the 3570 is the first or only SCSI device connected in line to the initiator, connect the SCSI cable coming from the initiator to the leftmost SCSI connector on the back of the library (see 1 in Figure 233).
  - 3. If the 3570 is not the first device on the SCSI bus, connect the SCSI interface cable coming from the next closest device to the leftmost SCSI connector on the back of the library (see 1 in Figure 233).
  - 4. If this is the last device on this SCSI bus, locate the SCSI interface terminator (P/N 61G8324) and attach it to the rightmost SCSI connector on the back of the library (see 2 in Figure 233).
  - 5. If the library is not the last device on this SCSI bus, locate the SCSI interface cable to the next device and connect it to the unused, rightmost SCSI interface connector on the back of the library (see 2 in Figure 233).
- Note:** There are two SCSI connectors on the back of the 3570 library. When they are connected correctly, each of these connectors must have either a SCSI cable or a SCSI terminator attached.
- 6. If this machine is a Model B11 or B21, proceed to “Cable Routing—Rack-Mounted Models” on page INST-62.
  - 7. If this machine is a Model B01, proceed to “Online Tests for Models B01, B02, B11, B12, B21 and B22” on page INST-67.

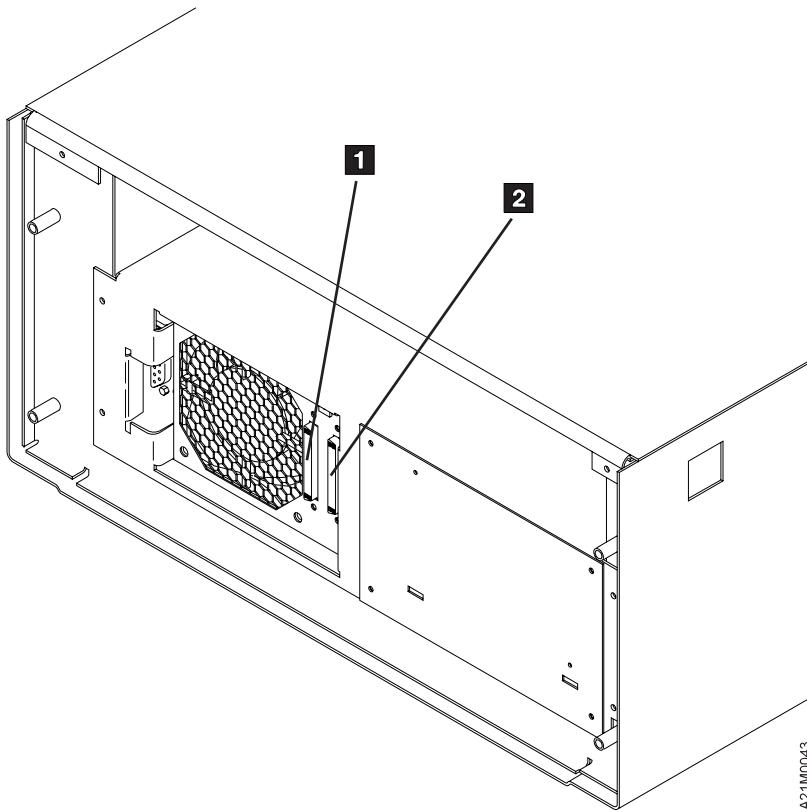


Figure 233. Rear View of Model B01 or B11

**Examples of SCSI Bus Cabling, Models B01, B11 and B21:** Figure 234 on page INST-53 shows an example of a single 3570 attached to the host (initiator). Figure 235 on page INST-53 shows an example of attaching multiple SCSI devices to a host.



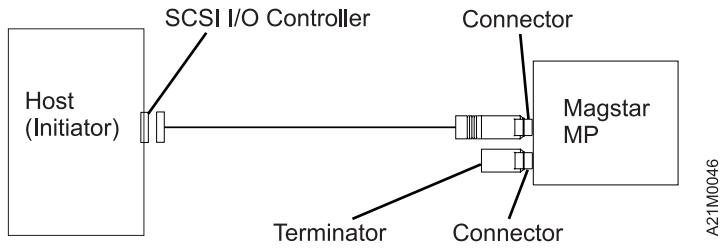


Figure 234. Example of Attaching One SCSI Device to the Host (Initiator)

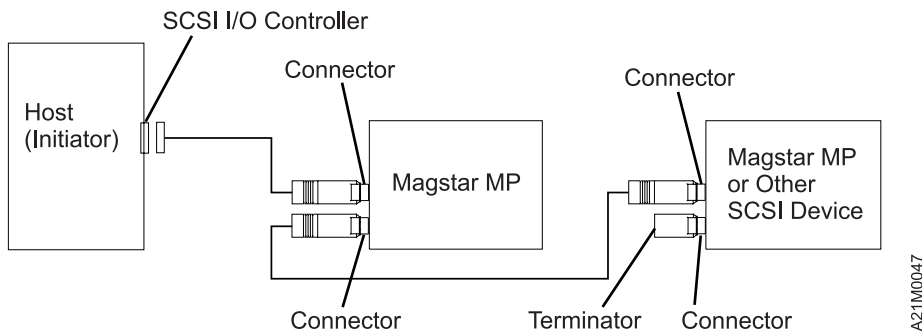


Figure 235. Example of Attaching Multiple SCSI Devices to the Host

| **Note:** The AS/400 does not support an attachment as shown in Figure 235.



## Model B02, B12 and B22 Connections

Refer to Figure 235 on page INST-53 for typical SCSI cabling diagrams while performing the following steps.

- \_\_\_ 1. If this machine is a Model B02, remove the back cover plate from the library. The cover is attached using plastic snap-in retainers. Rotate the plastic retainers one-quarter turn in either direction to release the cover.
- \_\_\_ 2. For a 3570 Split Configuration setup, continue at step 8. For a 3570 Base Configuration setup, continue with the following step. (See "Library Configurations" on page LIBRARY-7 for information about base and split configurations.)

### **Base Configuration:**

- \_\_\_ 3. Ensure the SCSI Bus Jumper (P/N 49G6456) is connected to the rightmost SCSI connector on the back of tape drive 1, and to the leftmost SCSI connector on the back of tape drive 2. (See items 2 and 3 in Figure 236 on page INST-55).
- \_\_\_ 4. If the 3570 is the first, or only, device in line connected to the initiator, connect the SCSI cable coming from the initiator to the leftmost SCSI connector on the back of the library. (See item 1 in Figure 236 on page INST-55).
- \_\_\_ 5. If the 3570 is **not** the first device on the SCSI bus, connect the SCSI interface cable coming from the next closest device to the leftmost SCSI connector on the back of the library. (See item 1 in Figure 236 on page INST-55).
- \_\_\_ 6. If this is the last device on the SCSI bus, locate the SCSI interface terminator (P/N 61G8324) and attach it to the rightmost SCSI interface connector on the back of the library. (See item 4 in Figure 236 on page INST-55). If the library is **not** the last device on the SCSI bus, locate the SCSI interface cable to the next device, and connect it to the unused, rightmost SCSI interface connector on the back of the library. (See item 4 in Figure 236 on page INST-55).
- \_\_\_ 7. Continue at step 17 on page INST-55.

### **Split Configuration:**

- \_\_\_ 8. Remove the SCSI Bus Jumper (P/N 49G6456) or (P/N 05H9527) that connects the SCSI connector on the back of tape drive 1 to the SCSI connector on the back of tape drive 2, if it is installed. (See items 2 and 3 in Figure 236 on page INST-55).  
**Note:** If attaching to an AS/400 System, the SCSI Bus Jumper must be removed. If attaching to other types of hosts, the SCSI Bus Jumper may be left in place to connect both devices on a single SCSI Bus.
- \_\_\_ 9. If tape drive 1 in the 3570 is the first, or only, device in line connected to the initiator, connect the SCSI cable coming from the initiator to the leftmost SCSI connector on the back of tape drive 1. (See item 1 in Figure 236 on page INST-55).
- \_\_\_ 10. If tape drive 1 is **not** the first device on the SCSI bus, connect the SCSI interface cable coming from the next closest device to the leftmost SCSI connector on the back of tape drive 1. (See item 1 in Figure 236 on page INST-55).
- \_\_\_ 11. If tape drive 1 is the last device on the SCSI bus, locate the SCSI interface terminator (P/N 61G8324) and attach it to the rightmost SCSI interface connector on the back of tape drive 1. (See item 2 in Figure 236 on page INST-55).
- \_\_\_ 12. If tape drive 1 is **not** the last device on the SCSI bus, locate the SCSI interface cable to the next device, and connect it to the unused, rightmost SCSI interface connector on the back of tape drive 1. (See item 2 in Figure 236 on page INST-55).

- \_\_\_ 13. If tape drive 2 in the 3570 is the first, or only, device in line connected to the initiator, connect the SCSI cable coming from the initiator to the leftmost SCSI connector on the back of tape drive 2. (See item 3 in Figure 236 on page INST-55).
- \_\_\_ 14. If tape drive 2 is **not** the first device on the SCSI bus, connect the SCSI interface cable coming from the next closest device to the leftmost SCSI connector on the back of tape drive 2. (See item 3 in Figure 236).
- \_\_\_ 15. If tape drive 2 is the last device on the SCSI bus, locate the SCSI interface terminator (P/N 61G8324) and attach it to the rightmost SCSI interface connector on the back of tape drive 2. (See item 4 in Figure 236).
- \_\_\_ 16. If tape drive 2 is **not** the last device on the SCSI bus, locate the SCSI interface cable to the next device, and connect it to the unused, rightmost SCSI interface connector on the back of tape drive 2. (See item 4 in Figure 236).
- \_\_\_ 17. When the 3570 is correctly connected, all four SCSI connectors on back of the 3570 (see 1, 2, 3, and 4 in Figure 236) must have either a SCSI cable or a SCSI terminator attached.
- | \_\_\_ 18. If this machine is a Model B12 or B22, proceed to “Cable Routing—Rack-Mounted Models” on page INST-62.
- | \_\_\_ 19. If this machine is a Model B02, proceed to “Online Tests for Models B01, B02, B11, B12, B21 and B22” on page INST-67.

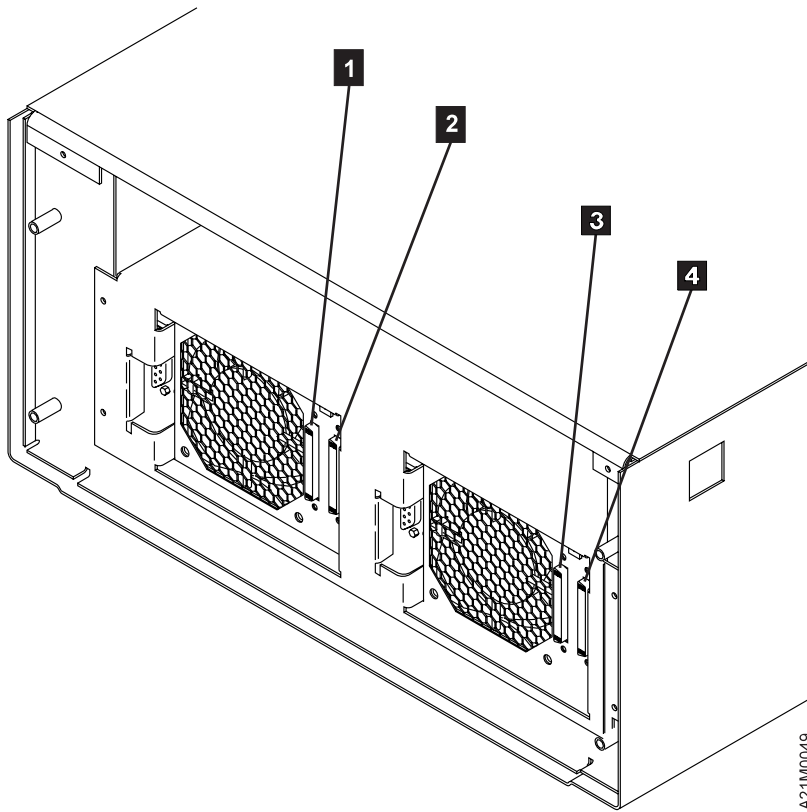


Figure 236. Rear View of Model B02, B12 or B22

**Example of SCSI Bus Cabling, Models B02, B12 and B22:** Figure 237 shows an example of a single 3570 Model B02, B12 or B22 in Base Configuration attached to the host (initiator). Figure 238 on page INST-57 shows an example of a single 3570 Model B02, B12 or B22 in Base Configuration attached to the host (initiator) with multiple other SCSI devices.

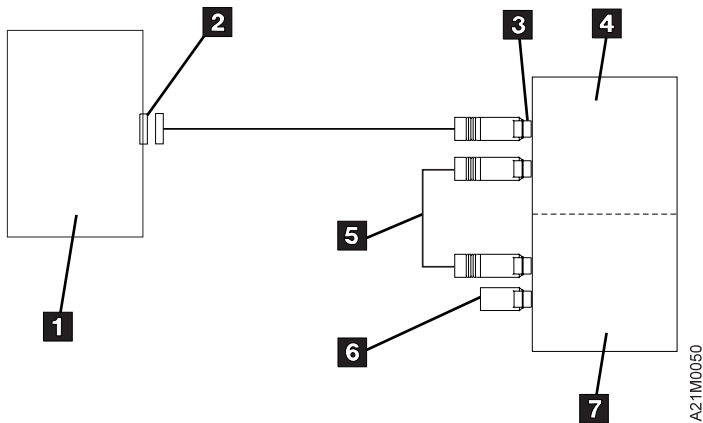


Figure 237. Example of Attaching One SCSI Device to the Host (Initiator)

**Note:** The 3570 Models B02, B12 or B22 are in Base Configuration

- |                       |                     |
|-----------------------|---------------------|
| 1 Host (Initiator)    | 5 SCSI Bus Jumper   |
| 2 SCSI I/O Controller | 6 SCSI Terminator   |
| 3 SCSI Connector      | 7 3570 Tape Drive 2 |
| 4 3570 Tape Drive 1   |                     |

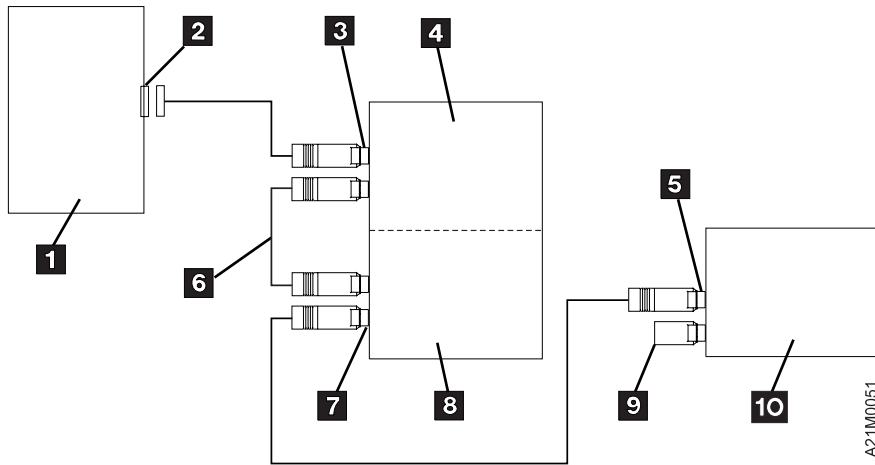


Figure 238. Example of Attaching Multiple SCSI Devices to a Host (Initiator)



**Note:** The 3570 Models B02, B12 or B22 are in Base Configuration

- |                       |                              |
|-----------------------|------------------------------|
| 1 Host (Initiator)    | 6 SCSI Bus Jumper            |
| 2 SCSI I/O Controller | 7 SCSI Connector             |
| 3 SCSI Connector      | 8 3570 Tape Drive 2          |
| 4 3570 Tape Drive 1   | 9 SCSI Terminator            |
| 5 SCSI Connector      | 10 3570 or Other SCSI Device |

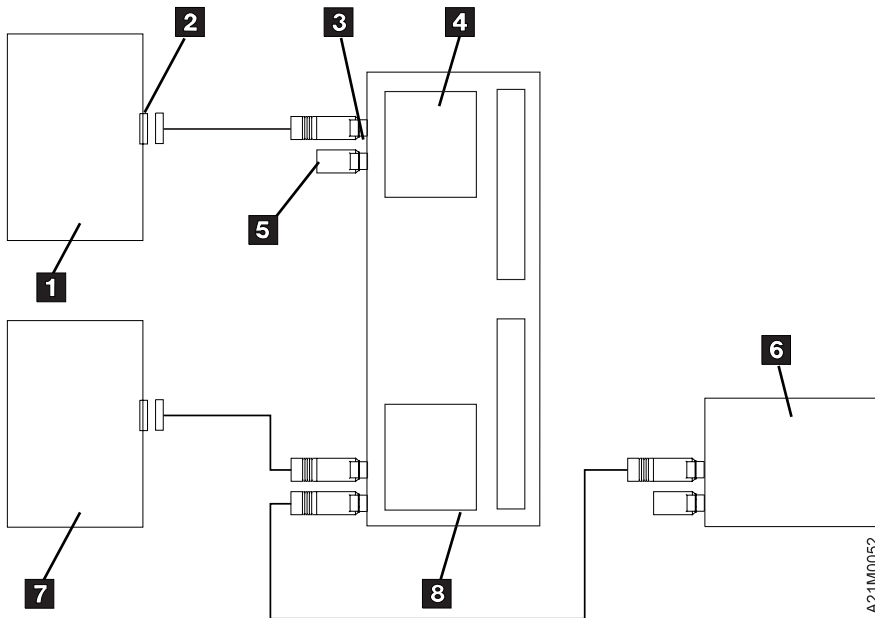


Figure 239. Attaching 3570 Models B02, B12 or B22 In Split Configuration

- |                       |                             |
|-----------------------|-----------------------------|
| 1 Host (Initiator)    | 5 SCSI Terminator           |
| 2 SCSI I/O Controller | 6 3570 or Other SCSI Device |
| 3 SCSI Connector      | 7 Host (Initiator)          |
| 4 3570 Tape Drive 1   | 8 3570 Tape Drive 2         |

Figure 239 shows an example of a single 3570 Model B02, B12 or B22 in Split Configuration. Tape drive 1 4 is a single SCSI device attached to the first host (initiator). Tape drive 2 8 is attached to the second host (initiator) with multiple other SCSI devices.

**AS/400 FC 6501 Connections to B02 or B12:** The following figures; Figure 240, Figure 241 on page INST-59, Figure 242 on page INST-59, and Figure 243 on page INST-60, show examples of 3570 Model B02 or B12 connections to an AS/400 FC 6501.

**Base Configuration**

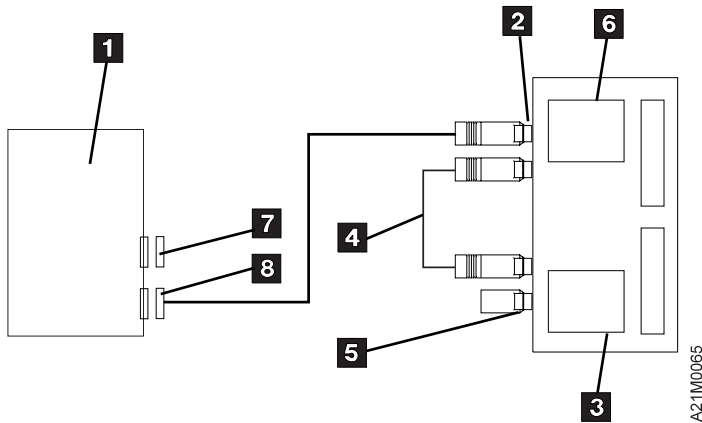


Figure 240. AS/400 FC 6501–Base Config/Split Config (single host, one IOP, one port)

- |                            |                     |
|----------------------------|---------------------|
| 1 Host (Initiator) FC 6501 | 5 SCSI Terminator   |
| 2 SCSI Connector           | 6 3570 Tape Drive 1 |
| 3 3570 Tape Drive 2        | 7 Port 1            |
| 4 SCSI Bus Jumper          | 8 Port 2            |

**Split Configuration (single host, one IOP, one port)**

**Note:** The cable connections are the same as for the Base Configuration.

- |                            |                     |
|----------------------------|---------------------|
| 1 Host (Initiator) FC 6501 | 5 SCSI Terminator   |
| 2 SCSI Connector           | 6 3570 Tape Drive 1 |
| 3 3570 Tape Drive 2        | 7 Port 1            |
| 4 SCSI Bus Jumper          | 8 Port 2            |

### Split Configuration (single host, one IOP, both ports)

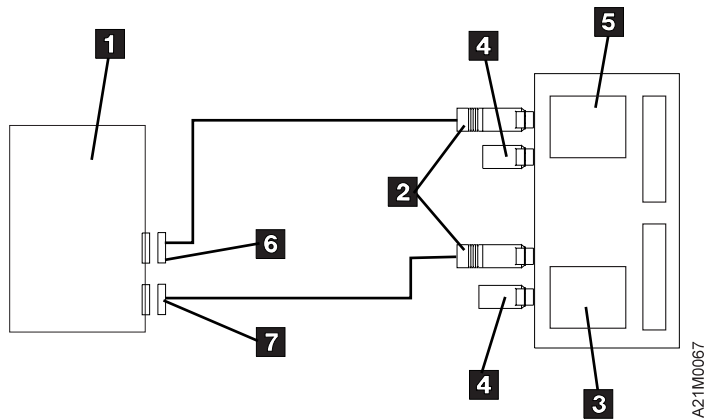


Figure 241. AS/400 FC 6501–Split Configuration (single host, one IOP, both ports)

- |                            |                     |
|----------------------------|---------------------|
| 1 Host (Initiator) FC 6501 | 5 3570 Tape Drive 1 |
| 2 SCSI Connector           | 6 Port 1            |
| 3 3570 Tape Drive 2        | 7 Port 2            |
| 4 SCSI Terminator          | 8                   |

### Split Configuration (two hosts)

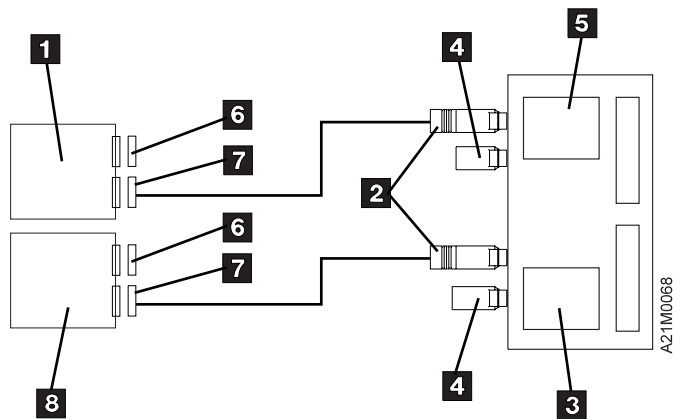


Figure 242. AS/400 FC 6501–Split Configuration (two hosts)

- |                              |                               |
|------------------------------|-------------------------------|
| 1 Host (Initiator) A FC 6501 | 5 3570 Tape Drive 1           |
| 2 SCSI Connector             | 6 Port 1                      |
| 3 3570 Tape Drive 2          | 7 Port 2                      |
| 4 SCSI Terminator            | 8 Host (Initiator) B, FC 6501 |
| 5 SCSI Terminator            |                               |



### Split Configuration (single host, two IOPs)

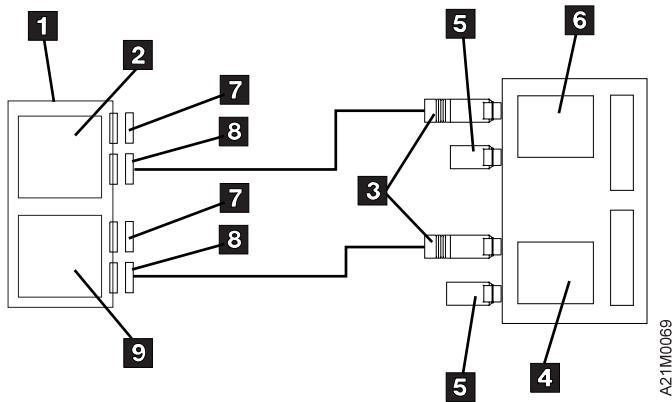


Figure 243. AS/400 FC 6501–Split Configuration (single host, two IOPs)

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1 Host (Initiator)               | 6 3570 Tape Drive 1              |
| 2 SCSI I/O Controller A, FC 6501 | 7 Port 1                         |
| 3 SCSI Connector                 | 8 Port 2                         |
| 4 3570 Tape Drive 2              | 9 SCSI I/O Controller B, FC 6501 |
| 5 SCSI Terminator                |                                  |



## Connecting the 3570 to Multiple Systems

**AS/400 Systems:** AS/400 systems cannot be interconnected using feature code 6501. Therefore a 3570 can only be attached to one AS/400 system at a time.

**RS/6000 Systems:** Multiple RS/6000 systems may be linked to a 3570, but the systems cannot use the drive simultaneously. See Figure 244. The systems can be interconnected using RS/6000 feature codes 2424, 2425, and 2426. Refer to RISC System/6000 documentation for additional information.

### Sun, HP-UX and Windows NT Systems

Sun, HP-UX and Windows NT systems may be linked to a 3570, but the systems cannot use the drive simultaneously. See Figure 244.

**Note:** The maximum SCSI bus length for a differential SCSI bus is 25 M (82.02 ft) minus 0.2 M (0.66 ft) per connection. Ensure that the total length of all SCSI cables and connections does not exceed the maximum.

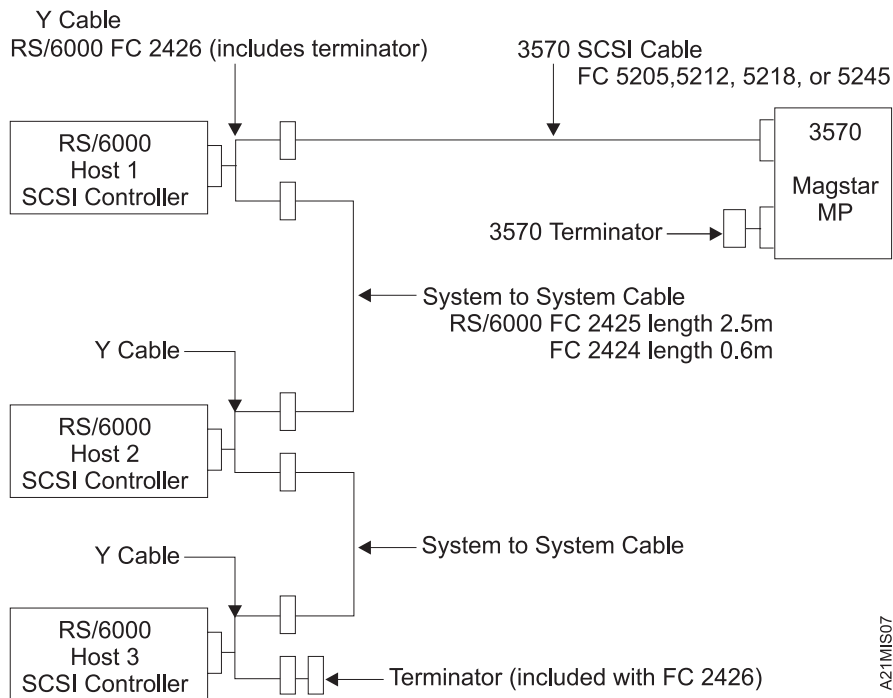


Figure 244. Multiple RS/6000 Systems Attached to a 3570



## Cable Routing—Rack-Mounted Models

See Figure 245 for Model B11, and Figure 246 on page INST-63 for Model B12.

See Figure 248 on page INST-64 for Model B21, and Figure 249 on page INST-65 for Model B22.

1. Route the power and signal cables 2 through the strain relief clamp 1 and along the cable arm assembly 3, as shown.
2. Loosely attach the cables to the cable arm assembly with cable ties 4 P/N 1159519. Do not tighten the cable ties until the cable length has been adjusted in the next step.

Note that there are 3 flat spots on each cable arm. Attach the cable ties at the flat spots.

3. Extend the slide and tray assembly all the way out so it is locked.
4. Adjust the cable length so there is no slack between the strain relief clamp and the end of the cable arm, as shown in Figure 247 on page INST-63 and Figure 250 on page INST-65.
5. Tighten all of the cable ties.

**Note:** Ensure that the connecting point of the cable ties are on the bottom side of the cables, as shown.

6. Move the slide and tray assembly all the way in and all the way out to ensure that the cables do not rub any place.

Ensure that the cable loop between the strain relief clamp and the end of the cable arm does not touch the rack side cover.

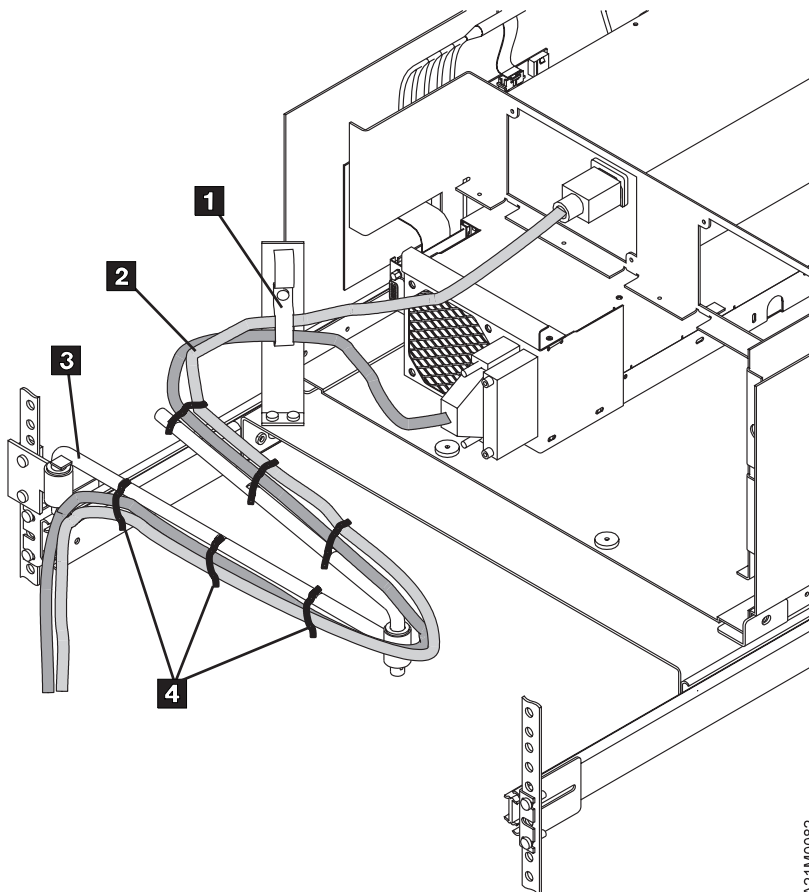
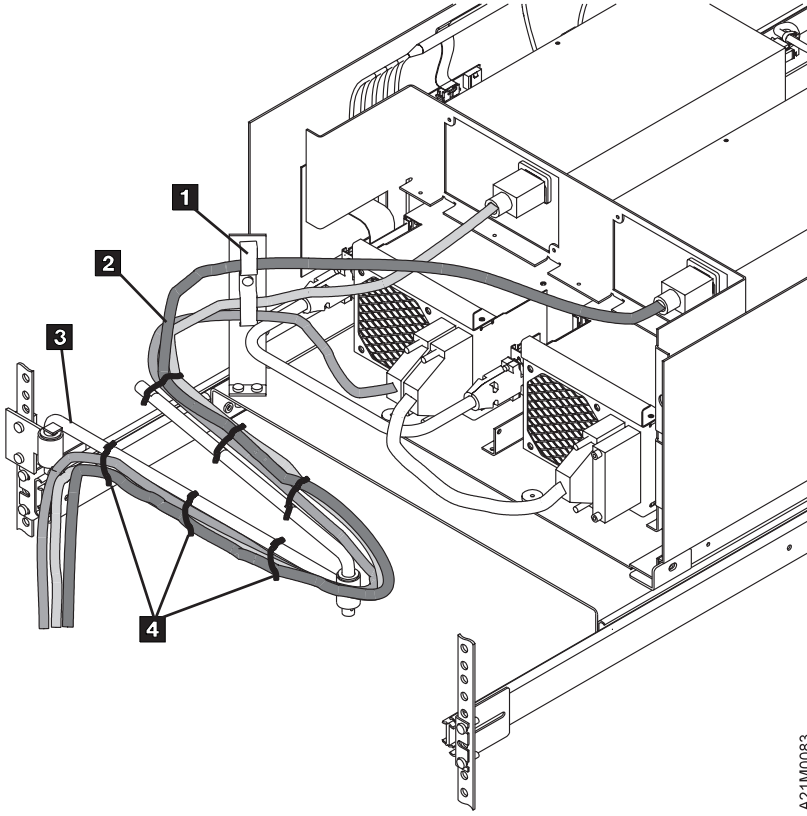
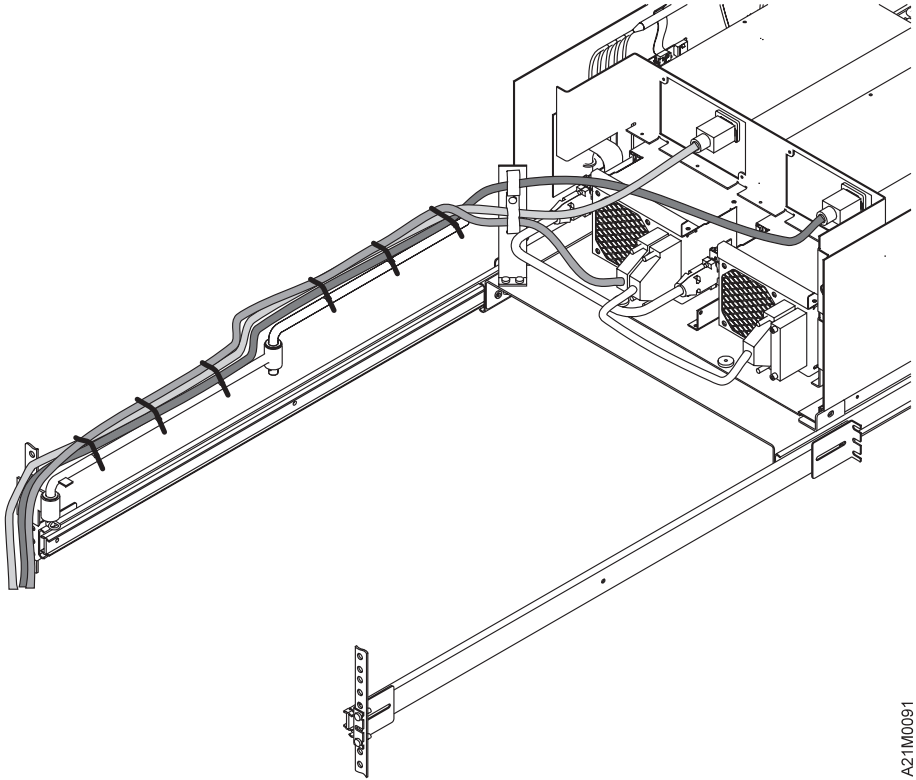


Figure 245. Cable Routing, Model B11



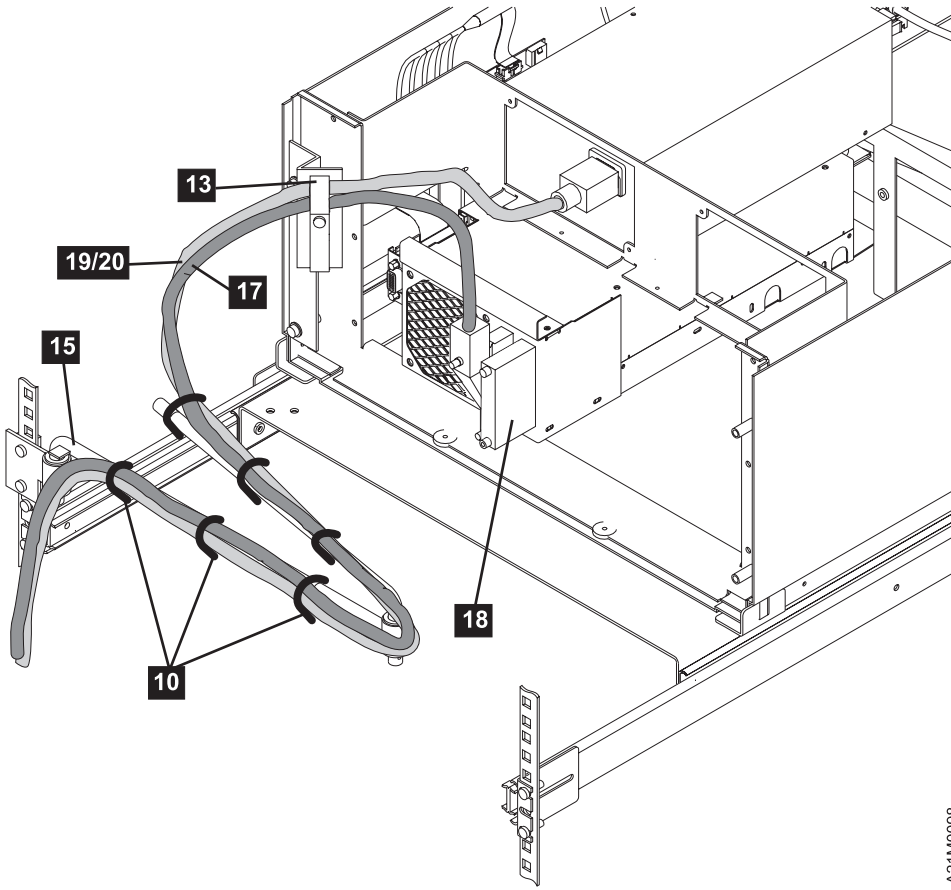
A21M0083

| Figure 246. Cable Routing, Model B12



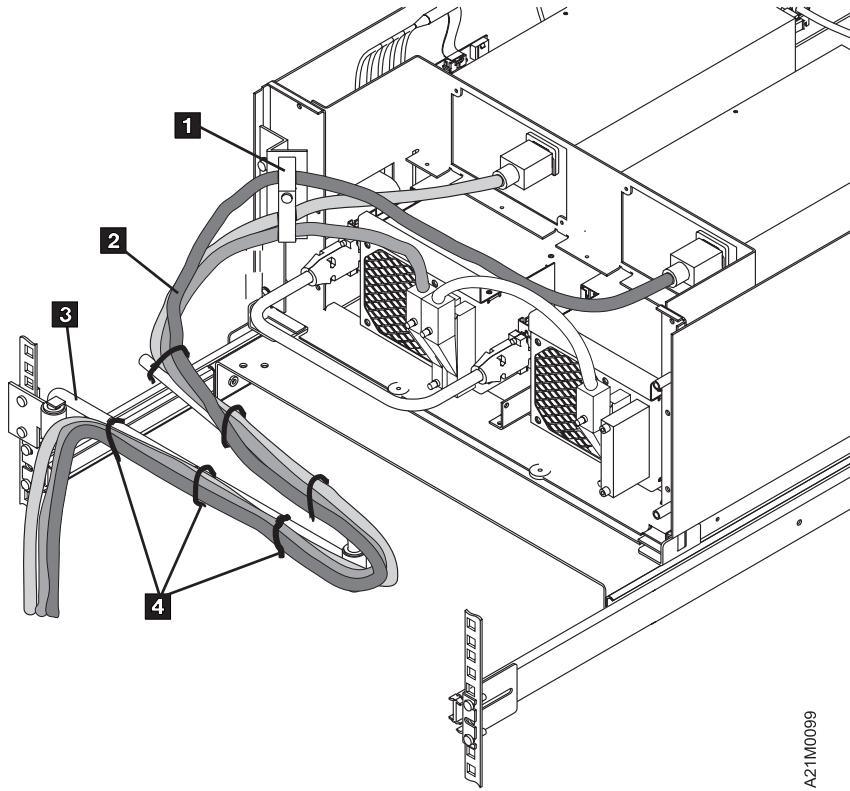
A21M0091

| Figure 247. Cable length adjusting Models B11 and B12

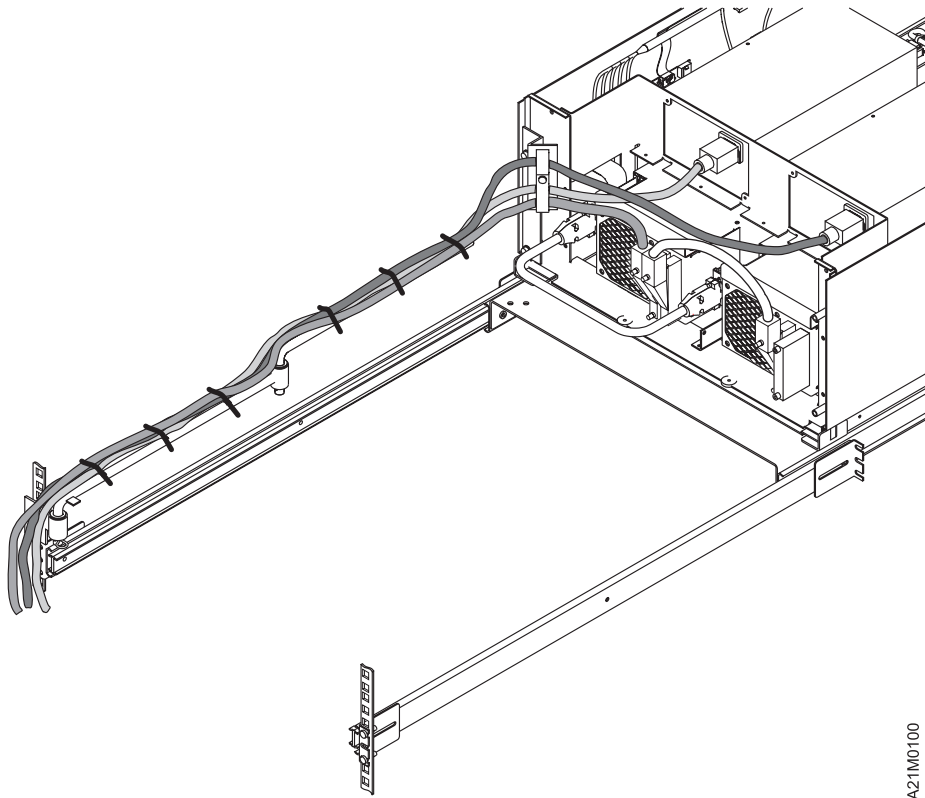


A21M0098

| Figure 248. Cable Routing, Model B21



| Figure 249. Cable Routing, Model B22



| Figure 250. Cable length adjusting Models B21 and B22

- | 7. Open the library front cover. (Unlock the door if necessary.)
  - | 8. For Models B11 and B12 rack installations, in the front of the rack, fasten the left front plate of the library to the rack with screw P/N 1624778. The screw should fasten to the nut-clip P/N 74F1823 in the top hole of the EIA unit above the left front slide. See 5 in Figure 222 on page INST-36.
  - | 9. For Models B21 and B22 rack installations, in the front of the rack, fasten the left front plate of the library to the rack with two M6 X 12 socket button head screws, P/N 1621950. The screws should fasten to the caged M6 nuts, P/N 12J5288, in the top hole of the EIA units above the left and right front slides 7 .
- | **Note:** The location of this caged nut 7 shown in Figure 222 on page INST-36.

## Online Tests for Models B01, B02, B11, B12, B21 and B22

- \_\_\_ 1. If this machine is a Model B01 or Model B02, re-install the rear cover on the library. Position the cover properly, then push the two plastic fasteners in place and turn each one slightly until secure.
- \_\_\_ 2. Ensure the power cord(s) are connected to the library and to the power source outlet selected.
- \_\_\_ 3. Place the Power switch to the On position.

**Note:** Whenever the 3570 power is switched OFF, wait approximately five seconds before switching the power ON again.

The power-on test takes approximately 2.5 minutes to complete and is automatically performed when the device is powered on.

If a failure occurs, a message can be posted in the operator panel or the operator panel can be blank. If either of these conditions exist, go to the START section for further analysis. When any faults are corrected, return here.

**Note:** If the 3570 is connected to a Windows NT device, the 3570 power must be switched ON first. If the 3570 power is **not** ON when the Windows NT device is powered ON, the Windows NT device will not recognize the 3570, even if the 3570 power is switched ON later.

- | \_\_\_ 4. The initiator device drivers must be loaded to communicate with the 3570. When this has been done, the library is ready for use. For attachment in RISC System/6000, Sun, HP-UX, Windows NT, or other Open System environments see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for instructions to install and configure the device driver. Tape device drivers are supplied for attachment to these systems. The AS/400 system has a tape device driver supplied as part of the operating system.

| **Note:** Ensure that the customer has installed the device driver (Windows NT, HP-UX, Sun (Solaris) or RS/6000 systems), or the required PTFs (AS/400 systems).

| To install the device driver and configure the device with **default** parameters, use the following procedures:

### | **For RISC System/6000:**

| **Note:** For additional information, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide, GC35-0154*.

#### | Performing the Default AIX Installation

| Use the *installp* utility for installation. The software is always committed after installation. Insert the Tape Device Driver/AIX Enhanced diskette into the diskette drive on the workstation.

| **Note:** You must have *root* authority to perform the commands in this section.

| To install the device driver, enter the following command from the command line:

```
| installp -acXd /dev/rfd Atape.driver
```

| If the same version of *Atape.driver* is installed, then use the *installp* command with the *-F* flag to force an installation. The installation procedure automatically de-configures any devices from the device driver and reconfigures them after the new driver is installed.

| Enter the following command to list the currently installed version of *Atape.driver*:

```
| lsllp -l Atape.driver
```

#### | Configuring the 3570

| After the driver software is installed and a 3570 is connected to the adapter card, the 3570 can be configured and made available for use. Access to the 3570 is not provided until the 3570 is configured.

- a. Configure a 3570 Tape Subsystem by entering the following command with no parameters:

```
cfgmgr
```

The command automatically configures all devices known to the *Atape.driver*, including any new 3570 devices.

- b. Enter the following command to verify that the configuration completed successfully:

```
lsdev -Cc tape
```

**For AS/400:**

Ensure the AS/400 system value for Auto Configure Devices is set to **ON**.

Turn the power ON. If the 3570 is not recognized by the host (initiator), confirm that the required PTFs are installed (see Figure 196 on page INST-6), and re-IPL the AS/400 IOP card to which the 3570 is attached.

**For other systems:**

For other system attachments, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for instructions to install and configure the device driver.

**Note:** If this is a Windows NT system, ensure that your customer has installed the proper Adaptec adapter card that is needed to attach the 3570 drive subsystem. See "Pre-Installation Checks" on page INST-2.

- 5. In the following host test, you should read and write a cartridge on any single drive system, and if more than one drive is being installed, you should write on the first and read back on the second, then write on the second and read back on the first.
  - a. If you are installing the 3570s in an AIX environment, perform "Checking the SCSI Attachment in an AIX Environment" on page PROC-76 and return here.
  - b. If you are installing the 3570s in an AS/400 environment, perform "Checking the SCSI Attachment in an AS/400 Environment" on page PROC-73 and return here.
  - c. If you are installing the 3570s in a Sun environment, perform "Checking the SCSI Attachment in a Sun Environment" on page PROC-80 and return here.
  - d. If you are installing the 3570s in a HP-UX environment, perform "Checking the SCSI Attachment in a HP-UX Environment" on page PROC-83 and return here.
  - e. If you are installing the 3570s in a Windows NT environment, perform "Checking the SCSI Attachment in a Windows NT Environment" on page PROC-83 and return here.



---

## Post Installation Reporting

After the 3570 is installed and tested:

- \_\_\_ 1. Update the account management plan book.
- \_\_\_ 2. Record the serial number (from the label) into the machine history log. See “Serial Number and Label Locations” on page INTRO-13 for its location.  
**Note:** This serial number must be recorded so it can be used to restore nonvolatile storage, as required by certain repair procedures.
- \_\_\_ 3. Record the level of the microcode installed into the machine history log. See “Check EC Level—Library Models” on page INST-44.
- \_\_\_ 4. Save the tools and the cartridges in a safe place.
- \_\_\_ 5. Report the installation complete using the existing branch office procedure.
- \_\_\_ 6. After successfully completing installation, notify the customer that the subsystem is now available for use.



---

## Removing a 3570

### Notes:

1. For World Trade countries, refer to WT General CEM 257, "General Internal Packaging Instructions for Replant Machines."
2. Before attempting to remove a 3570, ensure that you have the relocation kit.
3. If your host system has software aids for system upgrades, installations, or relocations, execute that software and follow the instructions it provides.

To remove a 3570, perform the following steps:

- \_\_\_ 1. Before proceeding, check the following:
  - \_\_\_ a. Ensure that the 3570 is unloaded and the tape cartridge has been removed or stored in the magazine.
  - \_\_\_ b. Notify the system operator that you must switch off power to the 3570 and that it will not be available.
- \_\_\_ 2. Set the Power switch to the Off position.
- \_\_\_ 3. Open the rear door of the rack.
- \_\_\_ 4. Set the circuit protector (CP) to the Off position **for this device only**.
- \_\_\_ 5. Remove the power cable(s) **for this device only** from the outlet in the rack.
- \_\_\_ 6. Disconnect the ac power cable from the 3570.
- \_\_\_ 7. Disconnect the interface cables from the 3570.
- \_\_\_ 8. Remove the cleaner cartridge from the cleaner cartridge storage cell.

## Remove or Relocate the Library Model in a Rack

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

### C2

#### CAUTION:

**The 3570 Model B11 and B21 weighs approximately 24 kilograms (53 pounds); it takes two persons to safely lift this unit.**

### C4

#### CAUTION:

**The 3570 Model B12 and B22 weighs approximately 29 kilograms (64 pounds); it takes two persons to safely lift this unit.**

**Note:** This notice is translated into selected languages. See **C2** and **C4** in the INSP section.

When removing nut clips, bolts, and screws, put them into the containers provided. Mark the containers with the correct part number.

1. Remove the rack covers.
2. Remove the 3570 from the shelf.
3. If the 3570 is to be relocated to a different rack or a different location in the same rack, perform the installation instructions.

4. Place the 3570 in the Customer supplied shipping box if you are not reinstalling the 3570. See “Repack Instructions for the 3570” on page INST-71.

## Remove or Relocate a Stand-Alone or Drive-Only Model

The following notices are translated into selected languages. Each notice contains an identifier (Caution=Cx).

### C1

**CAUTION:**

**The 3570 Model B01 weighs approximately 35 kilograms (77 pounds); it takes two persons to safely lift this unit.**

### C3

**CAUTION:**

**The 3570 Model B02 weighs approximately 40 kilograms (88 pounds); it takes two persons to safely lift this unit.**

**Note:** This notice is translated into selected languages. See **C1** and **C3** in the INSP section.

When removing nut clips, bolts, and screws, put them into the containers provided. Mark the containers with the correct part number.

- \_\_\_ 1. Ensure all the cables are disconnected.
- \_\_\_ 2. Move the device to the new location.

OR

- \_\_\_ 3. If you are not reinstalling the 3570, place it in the shipping box. See “Repack Instructions for the 3570.”

---

## Repack Instructions for the 3570

Before repacking the 3570, verify that there is no tape cartridge inserted in the 3570. For the library, verify there are no tape cartridges loaded in the magazine. If there are cartridges present, remove them.

To protect the tape drive loader mechanism during shipping, the loader should be moved manually to the **loaded** position. Before shipping the 3570, perform the steps under “Manual Load Procedure” on page PROC-25, but do not insert a cartridge when you are told to do so.

Remove the magazines from the library and slide the picker assembly all the way to the left. Refer to Figure 227 on page INST-43 and install the shipping stopper, item 1, with the orange tag, item 2, on the picker shaft to prevent the picker from moving during shipment.

Re-install the magazines, then close and lock the library door.





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# Common Procedures

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This section contains the common procedures that are referenced from other sections of the manual.

---

## Working with Electrostatic Discharge (ESD) Parts

See Figure 251 on page PROC-5. When wearing the ESD grounding wrist band 1, ensure that the ground clip 4 remains connected. Failure to do this creates a safety exposure, the same as wearing jewelry while working on live exposed electrical circuits.

Use the most current part number available when ordering a field ESD kit. In addition to the mat, the kit P/N 93F2649 contains the following components in a reclosable static-shielding bag:

Adjustable wrist band P/N 6405959 1

Wrist band cord P/N 74F9658 2

Mat cord P/N 93F2652 3

Cord extension P/N 93F2653 4

Large ground clip P/N 93F2654 5

All of the logic cards and sensors are ESD-sensitive parts in the 3570.

To prevent damage when working with ESD-sensitive parts, observe the following instructions and the instructions printed on the ESD mat. The following instructions are in addition to all the usual precautions:

Switch off power to the 3570.

Put on the ESD grounding wrist strap 1 before touching the ESD-sensitive part. This strap has a high resistance (1 megohm) resistor in series with the grounding clip 5. Use of the ESD grounding wrist strap is not dangerous to you. It discharges the static electricity from your body. Connect the clip to the flex ground strap of the gate to the frame. Keep the strap on while you are inserting or removing a logic card or handling any ESD-sensitive part.

Keep ESD-sensitive parts in their special ESD shipping bag until ready for installation.

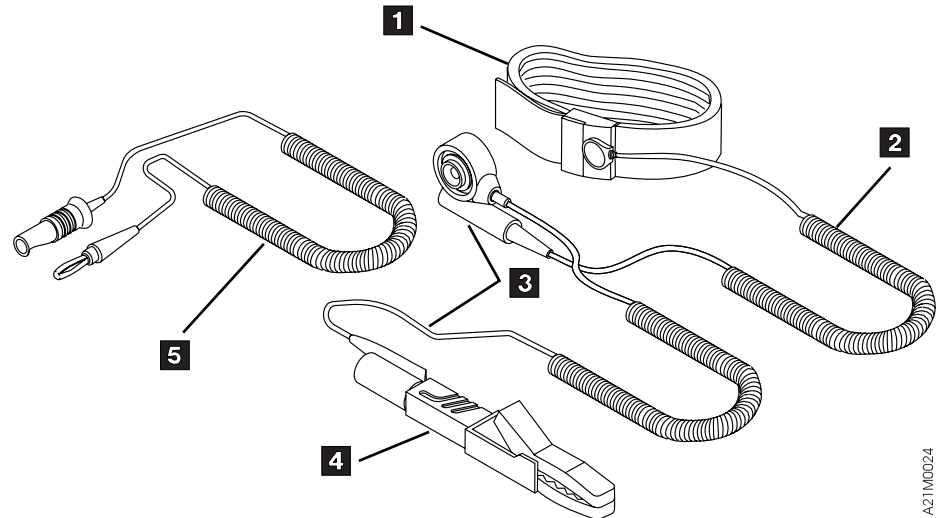
Do not place ESD-sensitive parts on any machine cover or on a metal table. If you need to put down the ESD-sensitive part for any reason, place it inside its protective shipping bag or on the ESD grounded mat provided in the ESD kit. (Large metal objects can be discharge paths without being grounded.)

Prevent ESD-sensitive parts from being touched by other personnel.

Reinstall all covers when not working on the machine.

Be extra careful when handling ESD-sensitive parts when cold-weather heating is used. Heating of cold air lowers the relative humidity, which increases the static electricity.






A211M0024

Figure 251. Static-Sensitive Device Attention Symbol and Grounding Wrist Strap

## FRU Removal and Replacement Procedures

Each FRU has its own specific format. A detailed illustration identified with numerals in reverse representation (for example, 1 ) indicates a part that must be removed. When a part is ESD-sensitive, it is identified with the ESD symbol  that indicates that the ESD grounding strap is required.

Compare the FRU in the subsystem to the replacement FRU. Note the cable and plug locations, and method of retention (screws, nuts, washers, or clips). Identify and label all wiring connectors to avoid incorrect connections when reinstalling the FRU. The removal then begins as indicated.

Follow the removal instructions and obey all Attention and Danger notes.

The replacement procedure is the reverse of the removal procedure, unless otherwise specified. If other procedures must be performed to verify the replacement, they are defined in the FRU's replacement procedure.

The same screws, nuts, washers, or clips are used in the replacement procedures unless otherwise noted.

## Tools Required

The following tools are used to perform certain procedures on the 3570 subsystem.

Screwdrivers

- Flat-blade
- Phillips

Allen wrench (2.5 mm and larger)

Nut-driver (7 mm)

Head-actuator cable holding template (Figure 296 on page CARR-25 )

---

## Prepare the Tape Device for Service

1. Notify the customer that the failing device must be varied offline as the power must be removed from the device.

**Note:** Both drives must be varied offline for Model B02 and Model B12. It is not possible to service one drive while the other drive is being used.

Proceed with the following steps after the device is offline.

2. Switch off power to the failing device by using the power switch on the device.
3. Return to the removal replacement procedure that sent you here.

---

## Powering Device On and Off

**Attention:** If the covers are removed, be careful of moving parts when power is turned on.

## Removing Subsystem Power during Normal Operations

To switch off power during normal operations, perform the following steps:

1. If the device is not varied offline, have the customer vary it offline.
2. If a cartridge is in the tape drive, select **Unload Drive** from the operator Options menu.
3. Switch off power by using the power switch at the front of the device.

## Restoring Drive Power during Normal Operations

**Note:** When you switch off power to the 3570, wait approximately five seconds before you switch on power again.

Restore power by setting the power switch to the On position. The power-on self-test runs automatically.

The power-on self-test takes approximately 2.5 minutes to complete. When the test is running, the panel indicates **Diags Running**. Communications with the interface is not acknowledged during the power-on self-test.

When the power-on self-test is complete, the customer can vary the device online.

If a failure occurs, a message is posted in the operator panel or the panel will be blank. If either of these conditions exist, go to "Maintenance Starting Point" on page START-4 and isolate the failure.



---

## FID FF—Operator Action or Host Program Error

FID FF is always presented to the host. Some types of problems are also presented on the operator panel.

- | Figure 156 on page PANEL-46 provides a log of a filtered subset of all Sense data sent to the host with a FID of FF. Use this log to assist in diagnosis of a FID FF problem.

### FID FF Displayed at Host and at Operator Panel

When the operator selects Force Error Dump from the Operator Services menu. Dump icon will also light indicating that a dump is available.

**Action:** To remove the dump icon, the device can be powered off, then on, or the dump can be read by the system host. The FID message can be removed without removing the dump icon by selecting **Reset Drive** on the Operator Services menu.

When a FID FF appears on the operator panel with a FSC E009, it is caused by someone forcing a check1 condition. When this happens, the service representative should look at the device error log for ATTENTION LIBRARY messages in the same timeframe. If no relevant ATTENTION LIBRARY messages are found in the device error log, the rest of the FID FF messages should be ignored, as they are intended for the host program use only, and are informational in nature.

### FID FF Displayed at Host Only—Not at Operator Panel

If FID FF was reported in the host error log via a **SIM message**, then perform the action indicated in the SIM message codes (for example, clean drive). Refer to the MSG section.

An invalid and unsupported SCSI command or parameter was received at the device from the host. This represents a SCSI application program software problem. Sense data exists at host.

An operator procedural problem. For example, FID FF is presented when a magazine is not in the library and the host issues a Load command. Another example is when the operator tries to switch to random mode when the magazine is not locked.

The service representative should look in the drive error log for any ATTENTION DRIVE or ATTENTION LIBRARY messages (which may have caused the FID FF to be sent to the host via sense data). If any of these ATTENTION messages are present in the error log, use that data to do further isolation for the FID FF cause.

---

## Suspected Microcode Problem

1. Power off, then power on the drive or library device.
2. Perform "Verify Fix" on page PROC-9, then return here.
3. If you get a FID, go to Figure 8 on page START-12 with that FID.
4. If the drive tests work OK, the fault could be a microcode problem or an intermittent hardware problem.

Ask the customer to try to recreate the failing scenario and to collect as much job/observation information as possible.

5. When a failure occurs, collect the information from the customer and contact your next level of support.

## Verify Fix

You can run Verify Fix diagnostics on the device from the operator panel. See “Verify Fix—Drive-Only Models” or “CE Verify Fix on Library Models” on page PROC-13.

You can also run the Verify Fix diagnostics from the host via the SCSI Send Diagnostic command with results of the tests returned to the host via the SCSI Receive Diagnostic Results command.

## Verify Fix—Drive-Only Models

Verify fix for drive-only models requires selection of the Write/Read functional diagnostic test. POST (power-on self-test) diagnostics are automatically run when the drive is powered on. POST diagnostics are also run automatically when the Write/Read functional test is selected. To run the Write/Read test:

1. While the drive unit is unloaded, press the Unload push button three times within a 1-second interval. Pressing a push button outside of the 1-second limit is ignored to allow for inadvertent operation by an operator. Pressing the Unload push button three times within one second causes selection of option 1, where the Maintenance and Clean indicator LEDs start flashing. The Maintenance LED will continue to flash while in **CE Mode**.
2. While the Maintenance LED flashes, and while in CE Mode, the other two LEDs represent the meanings described in Figure 252.

Figure 252. Stand Alone Drive CE Mode Options

Busy LED 1	Clean LED 2	Maintenance LED 3	Option	Meaning
Off	Flash	Flash	1	Exit Diagnostic Mode
Off	On	Flash	2	Run Diagnostics (Fix Verify)
Flash	Off	Flash	3	Read FMR Tape (Ucode Update)
Flash	Flash	Flash	4	Make FMR Tape
Flash	On	Flash	5	Force Dump (Via System)
On	Off	Flash	6	Write Dump to Tape
On	Flash	Flash	7	Reserved

**Note:**

1. Options 2, 4 and 6 require a scratch tape, and option 3 requires a FMR tape to be loaded.
2. See Figure 253 on page PROC-11 for location of stand-alone drive LED indicators.

1. To cycle through the options, press the Unload push button at one second intervals.
2. To select an option, press the Unload push button two times within a 1-second interval. The Busy and Clean LEDs will then go off.
3. You may leave the CE Mode at any time by selecting Option 1, or by turning the drive power off, then on.
4. When one of the options is selected that requires a tape cartridge to be loaded, the drive requests a tape to be loaded by flashing the Clean LED. The microcode will wait at least 20 seconds for a cartridge to be loaded. If a cartridge is not inserted within the 20+ second window, the test will fail with the Maintenance LED on solid. Press the Unload push button to return to Operator Mode. Return to CE Mode and select the option again.

5. If a cartridge is inserted within the 20+ second window, the appropriate option is initiated and the Maintenance LED continues to flash during the test.
6. At the completion of a **successful** Write/Read test, the Maintenance LED turns off, and the Clean LED turns on. Press the Unload push button to return to Operator Mode, and press the Unload push button again to unload the cartridge.

**Notes:**

- a. Pressing the Unload push button with a tape cartridge in the unloaded position in the drive is sensed and ignored by the microcode. No test activity is initiated.
  - b. Pressing the Unload push button any number of times if a cartridge is loaded causes the cartridge to unload and no tests are initiated.
7. Two ways to tell if the option ended without success:
- a. The Maintenance LED comes on solid when an operational error occurs. Examples of operational errors are the cartridge was file protected, or a cartridge was not loaded. To recover, press the Unload push button to return to Operator Mode, and press the Unload push button again to unload tape, if it was loaded. Correct the problem and try the option again.
  - b. If a hard error is detected while running any of the options, all three LEDs begin to flash quickly in unison, then all three LEDs will go **Off** approximately one full second before sending out the FID message in the form of flashing LEDs. The CE must count the number of flashes for each LED to determine which FID is being presented. The LED counts arrive in approximately 1-second intervals. When all the LEDs flash in unison again, the count is about to begin again. This will continue until reset by power off. The FID meanings are shown in Figure 254 on page PROC-12. Refer also to Figure 253 on page PROC-11 for location of LEDs on drive-only machines.

---

## Drive Indicator Decode for Drive-Only Models

For drive-only models, three drive LEDs provide operator messages under normal conditions. When a hard failure occurs, or when the drive is placed into CE Mode, the LEDs take on a new meaning. See “Drive Indicators and Operator Controls” on page INTRO-40 for a description of the indicators under normal operational mode.

Figure 253 shows the location of the Busy 1, Clean 2, and Maintenance 3 LED drive indicators. They are to be used to display CE Mode options and FID information on hard failures, when the drive is not part of a library machine.

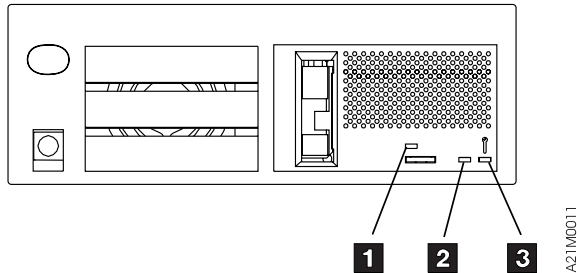


Figure 253. Drive Indicators—Drive-Only Models

Busy 1, Clean 2, and Maintenance 3 LEDs are also shown in Figure 254 on page PROC-12 along with the designated FIDs they represent while flashing after a hard failure.

Figure 254. Mapping of LEDs to FIDs on Drive-Only Devices

<b>Busy LED</b> <sup>1</sup>	<b>Clean LED</b> <sup>2</sup>	<b>Maintenance LED</b> <sup>3</sup>	<b>FID</b>
Number of Flashes in Cycle			
0	2	On Solid	DD
0	4	On Solid	E0
0	5	On Solid	E8
1	0	On Solid	B1
1	1	On Solid	BA
1	2	On Solid	BB
1	3	On Solid	BC
1	4	On Solid	C1
1	5	On Solid	C5
2	0	On Solid	B9
2	2	On Solid	BF
2	3	On Solid	CA
2	4	On Solid	CD
2	5	On Solid	D0
3	0	On Solid	D1
3	1	On Solid	D2
3	2	On Solid	D3
3	3	On Solid	D8
3	4	On Solid	E4
3	5	On Solid	E5
4	0	On Solid	E6
4	1	On Solid	E7
4	2	On Solid	EA
4	3	On Solid	EB
4	4	On Solid	EC
4	5	On Solid	ED
5	0	On Solid	EE
5	1	On Solid	F0
5	2	On Solid	F1
5	3	On Solid	F2
5	4	On Solid	F3
5	5	On Solid	FF

1. If a hard error is detected while running any of the options, all three LEDs will begin to flash quickly in unison, then all three LEDs will go **Off** approximately one full second before sending out the FID message in the form of flashing LEDs. The CE must count the number of flashes for each LED to determine which FID is being presented. The LED counts arrive in approximately 1-second intervals. When all the LEDs flash in unison again, the count is about to begin again. This will continue until reset by power off. The FID meanings are shown in Figure 254.



2. After decoding the FID number from the flashing drive LEDs, go to “FID Entry Point” on page START-12 for further isolation.

## CE Verify Fix on Library Models

**Note:** To run the verify fix diagnostics on drive-only models, see “Verify Fix—Drive-Only Models” on page PROC-9.

Verify fix for these library models requires selection of the Write/Read functional test through the Test Drive option on the CE Verify Fix menu of the operator panel. See Figure 132 on page PANEL-30.

Selection of the Test Drive option automatically executes the POST diagnostic tests before the Write/Read functional test is run. Some library tests are also part of the Test Drive option. Perform the following:

**Note:** Before you continue, take notice of the library mode that the machine is in because you will need to return the machine to that mode when the call is complete. You can determine the mode by selecting the **Show Status** screen on the Operator Mode menu.

1. At the library operator panel display, select **Set Library Mode** from the operator Options menu, then select the number of the drive to be tested.
2. From the Set Mode menu, select **Auto** or **Manual** mode for the library. The library must be in Auto mode to satisfy requests for specific cartridge mounts where the specified cartridge is placed in the priority cell.
3. Press the Mode push button on the operator panel to select CE Mode.

**Note:** When the 3570 is in CE mode, the subsystem is offline to the host and is unavailable to the host for read and write operations.

Figure 255 is displayed. Press the enter push button.

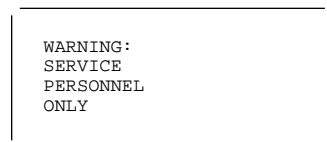


Figure 255. Warning Message

Select the number of the drive to be tested and press enter. The next screen will appear asking you to confirm the request for a mode change. See Figure 123 on page PANEL-23 for details on each option.

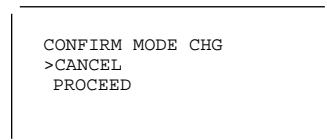


Figure 256. Confirm Mode Change

Press the Scroll Down push button until the arrow head (>) lines up with the Proceed option, then press the Select push button to obtain the following CE Option menu. For details on each option, see Figure 131 on page PANEL-30.

```
CE OPTION
>VERIFY FIX
DUMP
FMR TAPE      +
```

Figure 257. Verify Fix Menu

4. Press the Scroll Down push button until the arrow head (>) points to the Verify Fix option. Select **Verify Fix** from the CE Options menu, then select **Test Drive** from the CE Verify Fix menu.
5. The routine is executed in two parts:
  - All of the (POST) verification routines are executed. If no failures are detected, a message is displayed on the library operator panel display with instructions to load a scratch cartridge by placing it in the priority cell.
  - Load a scratch tape into the priority cell and select **Load From PRI Slot** on the Load Scratch Tape Menu. When you load a scratch cartridge, all of the motion and write/read verification tests are executed. Other panels and messages are displayed during execution of the Test library option.
  - Improvements were made to the microcode (release 4\_xxx or later) where it now takes only 3 minutes to complete all the tests that are executed as part of the 3570 Test Drive option. The test may take longer if any read or write errors occur. Wait for the test to complete.
6. After the successful completion of the Write/Read functional tests, a menu is displayed which allows the scratch cartridge to be unloaded. After all verification tests have completed successfully, the display on the operator panel displays a menu showing CE Action Successful.
7. If testing more than one drive, repeat the previous steps for the second drive.
8. If the diagnostics fail without a FID displayed,
  - a. Select Unload drive.
  - b. Select Cancel.
  - c. Select Verify Fix.
  - d. When the request for scratch tape appears, try another tape cartridge. If the drive stills fails, go to reported FID F0 in "FID Entry Point" on page START-12.
9. If additional library tests need to be run to verify the area that was failing, one or more scratch tapes may be placed in any magazine cell, in Import position. If you power OFF the device, and power it back ON, the library will load and read each cartridge that it finds in the Import position. If only one scratch tape is available, move the tape to another slot in Import position, power OFF, then power ON. This must be repeated for each magazine cell to be tested.
10. If an error occurs, a FID1, FID2, FID3 or FID4 message with a FID callout is displayed on the library operator panel display. Go to "FID Entry Point" on page START-12 and use the displayed FID to determine the repair actions.

## Verify Fix from the Host

SCSI diagnostic commands initiated from the host perform special functions normally only available from the operator panel of the 3570 library models. They are also used to execute 3570 fix-verification diagnostics for all 3570 models. The ability to exercise/test the device is dependent upon the host that is attached. Most can be configured to invoke any of the following Verify Fix tests:

- POST tests
- Write/read functional tests
- Library tests

## Self-test

For procedures that pertain to your host, refer to one of the following:

1. "Checking the SCSI Attachment in an AS/400 Environment" on page PROC-73.
2. "Checking the SCSI Attachment in an AIX Environment" on page PROC-76.
3. "Checking the SCSI Attachment in a Sun Environment" on page PROC-80.
4. "Checking the SCSI Attachment in a HP-UX Environment" on page PROC-83.
5. "Checking the SCSI Attachment in a Windows NT Environment" on page PROC-83.

## Hardware Reset

In library models, a hardware reset equivalent to a power-on reset of the drive unit and library can be done from the operator panel by pressing the Change Mode push button, the Scroll Up push button and the Enter push button at the same time (Change Mode+Scroll-Up+Enter).

In drive-only models, turn power OFF and then back ON to create a hardware reset.

---

## End of Call

**Note:** When you switch OFF power to the drive or library device, wait approximately 5 seconds before switching ON power again.

1. Set the Power switch to the ON position.

The power-on test takes approximately 2.5 minutes to complete, and is automatically performed when the 3570 power is switched ON. The tests that run depend on the model of 3570 you have installed:

### Model B00 Drive

- a. The drive LEDs will light solid for a time, then go out.
- b. The Maintenance LED will blink while the diagnostic is running.
- c. When the test is concluded without error, the drive LEDs will all go off.
- d. If an error occurs, the drive LEDs will flash quickly, then begin to send the FID via flashing LEDs. To decode these flashing LEDs, see Figure 253 on page PROC-11.

### For library Models:

- a. The three LEDs will go on solid momentarily, then will begin to blink as the power—on diagnostics run.
- b. The picker assembly will move back and forth from side to side, then will begin to calibrate its position in relation to the magazines.
- c. The picker assembly will then sense each cartridge and indicate full or empty slots in the magazine.
- d. If an error occurs, it is displayed in the library operator panel display.

If a failure occurs on any model, go to the START section for further analysis.

2. If you replaced the drive logic card, (FID EA), which contains VPD information, do the following:
  - a. Ensure the microcode was updated. See step 6 on page CARR-17.
  - b. Ensure the drive options and customer options are correct. See "Set Drive Options—Library Models" on page INST-45.
3. Run tests for the areas you have been making repairs to; if the drive was repaired, run the Drive Test, if the library was being repaired, run the Library Test:

- a. For the procedure to verify the fix on library models, continue at “CE Verify Fix on Library Models” on page PROC-13, then return here.
  - b. For the procedure to verify the fix on drive-only models, continue at “Verify Fix—Drive-Only Models” on page PROC-9, then return here.
4. If this is a drive-only model, continue at step 11.
  5. If your machine is a library model, continue with step 6.
  6. You were asked to note the library mode that the customer was using, before you ran library diagnostics. You will need to return the library to the customer desired mode when you are done with this call.
  7. Press the Change Mode push button to place the device in Operator mode.
  8. Select **Set Library Mode**, then select the drive number.
  9. Set the library mode to the mode that the customer was using before you made any mode changes.
  10. If the display indicates *Offline*, have the operator perform the procedure to set the device online.
  11. If the problem involved the SCSI bus or hang conditions, perform
    - “Checking the SCSI Attachment in an AS/400 Environment” on page PROC-73
    - “Checking the SCSI Attachment in an AIX Environment” on page PROC-76
    - “Checking the SCSI Attachment in a Sun Environment” on page PROC-80
    - “Checking the SCSI Attachment in a HP-UX Environment” on page PROC-83
    - “Checking the SCSI Attachment in a Windows NT Environment” on page PROC-70

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## Short-cut Test Procedure—Library Devices

The following procedure may be used to test a drive after replacement of a FRU, prior to cover installation and installation back into the library. Use the procedure only if you believe that the drive must be taken apart again to replace another FRU. After replacing the FRU, do the following:

### Short-Term Re-Cabling and Test Procedure

1. If you have a convenient work space, and the cables are long enough, you can place the drive unit close to the machine, without actually installing it into the library, and test it. **Be careful not to short out any components when doing this procedure.** With power off, attach the following cables:
  - a. 4-wire power connection between the drive and power supply
  - b. 2-wire fan power connection between the drive and power supply
  - c. Ribbon cable CAC-P1 between the drive and library control card (library models only)
  - d. the ac power cord to power supply

**Note:** You don't have to attach the SCSI cables to run this procedure.
2. Power ON the library and allow the device to progress through the power-on tests.
3. If the tests run OK, continue with this procedure. If the tests fail, power OFF, remove the cables just installed temporarily, and replace the next FRU in the FID list. Start at the top of this procedure again.
4. After the power-on tests run to completion, place a scratch cartridge into the Priority Cell.
5. Load a scratch cartridge and select the Start option from the Operator options menu.

6. When the library device retrieves the cartridge from the priority cell to insert into the drive (which at this time is not there), manually insert another scratch cartridge into the drive. The library will drop the first cartridge in the base of the machine. If your timing is good, the device will accept the cartridge you inserted into the drive without causing an error.
  7. When the drive has finished reading a tape, it will eject the cartridge. You can quickly take the cartridge from the drive, and insert the other cartridge that was dropped into the base of the machine (where the drive normally is located), into the picker assembly so that it can put it back into the priority slot. If your timing is good, the device will accept the cartridge that you manually inserted into the picker without causing an error.
  8. If your timing is not good at first, you may restart the procedure by cycling power on the library.
  9. In this way, you can check out the drive without having to put all the covers on and without having to install the drive completely into the library.
- Note:** You must be very careful not to short any components when using this procedure. Careful handling of components and the uncovered drive is essential to protect the electronics.



## Library Sensors Checkout Procedure

This procedure is used to display the dynamic settings of the library and drive sensors. A delay of approximately one second is required for the sensor to change state. The Disp Sensor menu and routine may be accessed from the "CE Mode Menus" on page PANEL-24, then select **UTILITIES**, then **DISP SENSORS**. Figure 258 summarizes the Sense routine menu, the meaning of each menu item, and one or more suggested methods to test each sensor.

Use the Up or Down arrows to display the sensor status that you want to check. There is a blank line separating the drive sensors and the library sensors.

**Note:** It is necessary to have power on the machine while running the sensor checkout procedure. Some procedures, such as manual load and unload of a cartridge, may ask you to power off the device to perform a procedure safely. When the procedure is completed, you will need to power on the machine and start the sensor checkout procedure again to verify the sensors.

Figure 258 (Page 1 of 2). Library Sensors Menu Display, Meanings and Test Methods

Menu Display	Meaning and How To Test
>CANCEL +	Select to cancel routine
	***** DRIVESENSORS*****
CI:0 UB:0	<p>Cartridge inserted in loader and Unload button. Manually load and unload a cartridge into the drive.</p> <ol style="list-style-type: none"> <li>1. Load and unload a cartridge to test the Cartridge Inserted sensor. See "Manual Unload of Tape Cartridge" on page PROC-24 and "Manual Load Procedure" on page PROC-25 for procedures. The cartridge moves a flag up when inserted to block a sensor on the drive logic card. Inserted=1; removed=0.</li> </ol> <p><b>Note:</b> Some referenced procedures ask you power off the device to perform the procedure safely. After completion of the procedure, you will need to power on and restart the Sensor Checkout Routine.</p> <ol style="list-style-type: none"> <li>2. Press the Unload push button to change the state of the UB sensor.</li> </ol>
CT:0000	Cartridge type. Manually operate the four cartridge type sense pins that sense the holes at the bottom of the cartridge case (3) and the hole below the file protect hole (1). The bits should change to reflect the four pins as they are depressed. See Figure 259 on page PROC-20 for a picture of the cartridge sense assembly and the pin layout.
LH:1 FP:0	<p>Loader home, File protected. Manually load and unload a cartridge into the drive. With the loader <b>unloaded</b> the loader home sensor should=1. With a cartridge <b>loaded</b>, the loader home sensor should=0. See "Manual Unload of Tape Cartridge" on page PROC-24 and "Manual Load Procedure" on page PROC-25 for procedures.</p> <p><b>Note:</b> Some referenced procedures ask you power off the device to perform the procedure safely. After completion of the procedure, you will need to power on and restart the Sensor Checkout Routine.</p> <p>To exercise the file protect sensor, move the file protect lever to the top of a cartridge and load that cartridge, <b>or</b> if no cartridge is loaded, open the drive door and press the top pin that senses the file protect lever located inside the cartridge. Pin depressed (file protected) the sensor should=1; release the pin (not file protected) should=0.</p>
	***** LIBRARYSENSORS*****
DO:0 CCP:1	Library door open, Cleaner cartridge present in the library clean slot. Open and close the library door. Door open=1; door closed=0. Remove and insert a cleaner cartridge. Cleaner cartridge present=1; not present=0.
M1P:1 M2P:1	Magazine 1 and 2 present. Remove and insert magazines. Magazine present=1; not present=0.
GIA:0 GIB:0	Global interference A and B. Block the global sensor between the drive and picker (A) or between the magazine and picker (B). Blocked (interference)=1; not blocked (no interference)=0.
PS:0 CP:0	Priority slot, Cartridge present. Remove or insert cartridges in the priority slot. Priority slot=1 when full; empty=0. The cartridge present sensor is located on the picker assembly on the magazine side. Load a cartridge in the picker and observe the cartridge present sensor indication. When cartridge is present, cartridge present=1; not present=0.

Figure 258 (Page 2 of 2). Library Sensors Menu Display, Meanings and Test Methods

Menu Display	Meaning and How To Test
P1:0 P2:0	Accessor picker pinch 1 and 2. Manually activate and release pinch 1 and 2 mechanisms by turning picker gears which move the picker cam in either direction. Pinch activated=1; deactivated=0.
L1:0 L2:0	Access limit sensors 1 and 2. Manually insert a cartridge into the picker and move the cartridge either direction from center to activate limit switches. At limit of travel=1; not at limit of travel=0.
<b>Note:</b> Menu values represent a library with an empty drive, picker, and priority cell, cleaner cartridge and both magazines installed, and the library door closed. The Unload push button is not depressed.	



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## Cartridge Sensor Pin Locations

The following figure shows the locations of the cartridge sensor pins. The pins may be observed through the drive door at the front of the drive:

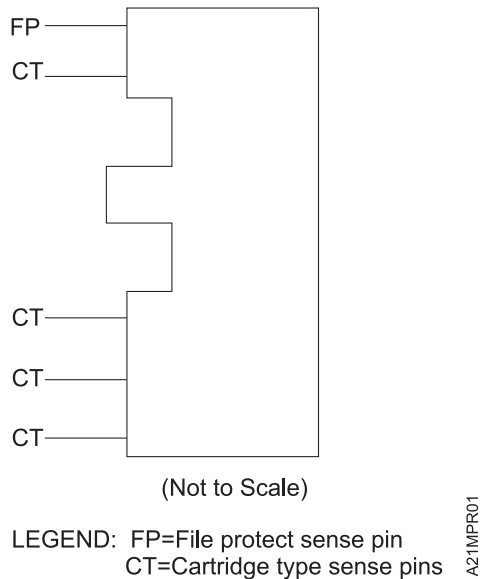


Figure 259. Cartridge Sensor Assembly, Drive Front View (Unloaded)

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## Inserting or Removing a Magazine

**Note:** Be careful when opening and closing the library door not to move cartridges from the export position back to the import position.

There is a release lever under each magazine 1 and 2. Both of these levers look and operate alike. An example of how to insert the rightmost magazine (magazine 1) into the library unit follows. The procedure for the leftmost magazine (magazine 2) is identical.

### Insert a Magazine

To insert a magazine, refer to Figure 260 on page PROC-21.

1. Open the library door, item 1 .
2. Ensure that the magazine release lever, item 2 , is in the open position (all the way to the right).
3. Slide the cartridge magazine into the magazine opening, item 3 until it seats fully. The magazine is oriented with its own release latch (see item 1 in Figure 261 on page PROC-22) **on the bottom** of the magazine.

**Notes:**

- a. Do not attempt to insert the magazine when it is upside down. The release latch, item 1 , must always be at the bottom.
- b. If there are multiple cartridges in the magazine, they must all be evenly positioned in either the import or export position. If all of the cartridges in the magazine are not carefully and uniformly lined up in the import position, or all of them are not carefully and uniformly lined up in the export position, the magazine cannot be inserted.



c. Figure 260 on page PROC-21 shows the Model B01, B02, B11 and B12 style door and operator display. The Model B21 and B22 are similar but have notched slots in Library front cover assembly and a flat faced operator panel display.

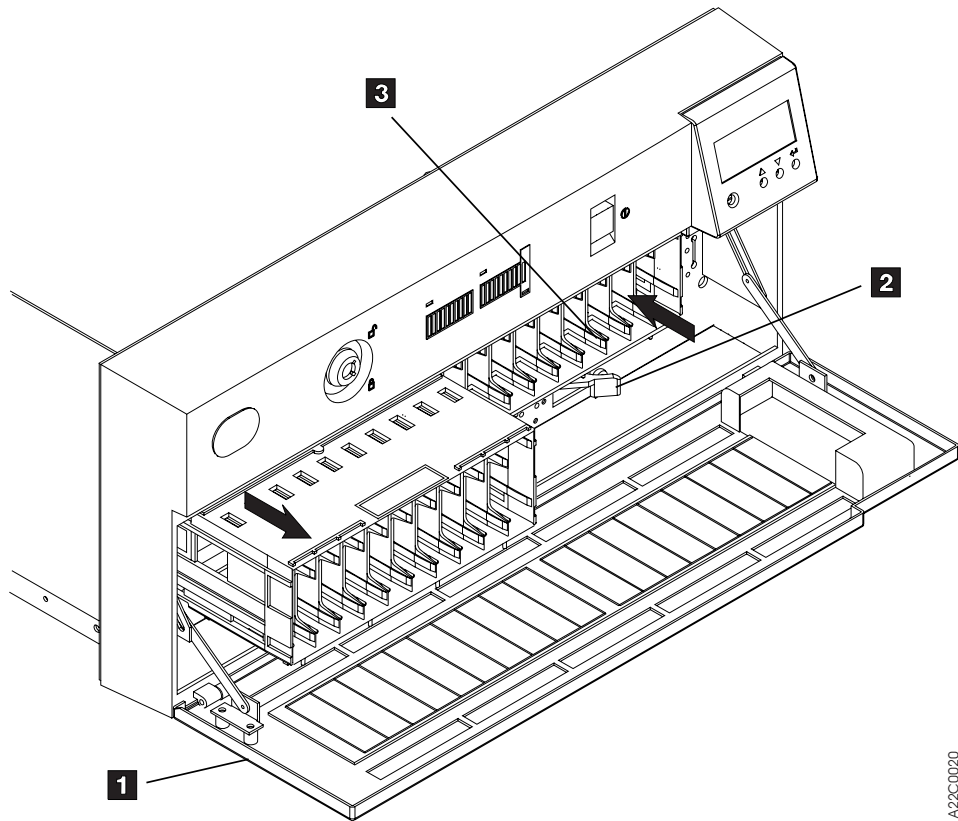


Figure 260. Loaded and unloaded Magazine (with the Door in the Open Position)

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4. Move the magazine release lever, item 2 all the way to the left to lock the magazine in place.
5. Close the library door, item 1 .

## Remove a magazine

To remove a magazine, refer to Figure 260 on page PROC-21.

1. Open the library door.
2. Move all exported cartridges back to the import position.  
**Note:** All the cartridges in a magazine must be evenly lined up in the import position or the magazine cannot be removed.
3. Move the library unit's magazine release lever, item 2 , beneath the magazine to the open position (to the right).
4. Pull the magazine straight out as shown in Figure 260 on page PROC-21.
5. After removing the magazine from the library, close the library door, item 1 .

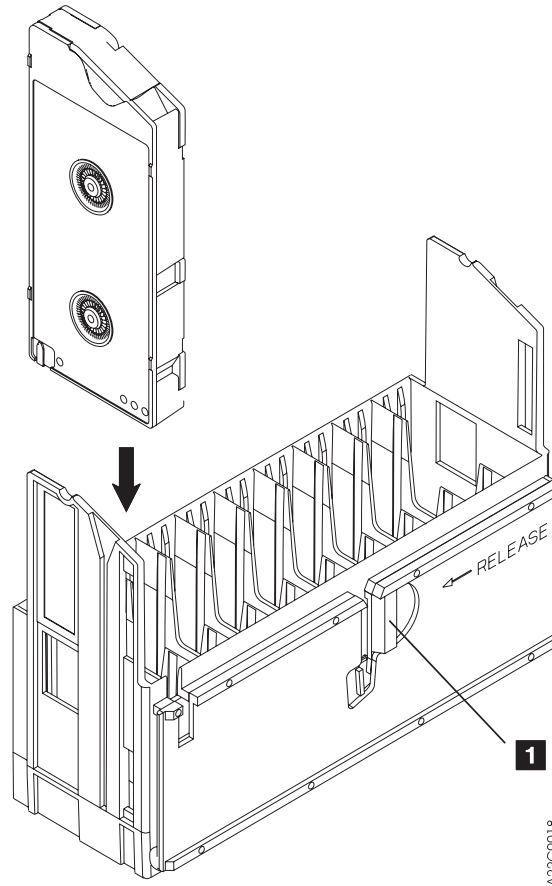


Figure 261. Loading a Cartridge in a Magazine (with Operator Side Facing Down)

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## Removing Tape Cartridge from Drive

The following procedure should be used when removing a tape cartridge from a 3570 tape drive. Two conditions are defined; remove the tape cartridge with power on the device if possible, and removing a tape cartridge manually, with power off the device. Choose the condition that best fits your situation.

### Remove Tape Cartridge Under Power

Use this procedure if the tape cartridge is not physically bound-up inside the drive.

**Note:** If the cartridge is bound-up inside the drive, you should perform the “Manual Unload of Tape Cartridge” on page PROC-24.

“Prepare the Tape Device for Service” on page PROC-6, then power the device off then back on. If the drive circuits are working properly, the drive should automatically unload the tape cartridge. An alternate method is to press the Unload push button on a stand-alone drive, or select the **Unload Drive** from the operator Options menu. If either of these methods fail to unload the tape cartridge, see “Manual Unload of Tape Cartridge” on page PROC-24 for further directions.



# Manual Unload of Tape Cartridge

Choose the configuration that best fits your customer situation:

## Preparation for Stand-alone Drive

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Power off the drive if not done already.
3. Perform the removal procedure for "Decorative Cover—Drive-Only Models" on page CARR-5 if needed to complete the next step.
4. Perform the removal procedure for "Drive Assembly Front Cover" on page CARR-15 to expose the drive loader motor and sensors.
5. Continue with "Continue Manual Unload Procedure."

## Preparation for library Models

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Power off the library device if not done already.
3. Perform the removal procedure for "Library Chassis Covers" on page CARR-4.
4. Perform the removal procedure for "Drive Assembly Front Cover" on page CARR-15 if it is installed.
5. Continue with "Continue Manual Unload Procedure."

**Continue Manual Unload Procedure:** Refer to Figure 263 on page PROC-27 to see key components which show if the drive is in the 'unloaded' or the 'loaded' position. If tab, item 2, is between the sensors as shown on Figure 263 on page PROC-27, the drive is in the unloaded position. File protect and cartridge sensor assembly, item 1, will be away from the cartridge door as shown. Refer to Figure 264 on page PROC-27 to see key components which show if the drive is in the loaded position. In this case, the tab, item 2, is NOT between the sensors, and file protect and cartridge sensor assembly, item 1, is against the closed door (if no cartridge is present) or is touching the cartridge (if one is present).

**Note:** On some drives a metal shield prevents you from seeing the tab, item 2, from the front of the drive. You will be able to see the tab, item 2 move if you look down from the top of the drive.

Refer to Figure 263 on page PROC-27 and Figure 264 on page PROC-27 when performing the following procedure. The item numbers will refer to these figures. For ease of understanding, Figure 262 on page PROC-26, a view of the front of the loader is also given. The large drive gear in the procedure is item 1 in this view.

1. Rotate the first intermediate drive gear, the large gear, item 3, in a clockwise direction. This large gear turns the smaller drive loader motor gear, item 4. Rotate the gear until the cartridge is freed and moves slightly out of the drive, and the tab 2, lines up with the sensor assembly, and the file protect and cartridge type sensor assembly item 1, moves to the right away from the cartridge door.
2. Remove the tape cartridge if present.

**Manual Load Procedure:** While repairing a drive, you may need to perform manual load of a tape cartridge.

Refer to Figure 263 on page PROC-27 and Figure 264 on page PROC-27 when performing the following procedure. The item numbers will refer to these figures. For ease of understanding, Figure 262 on page PROC-26, a view of the front of the loader is also given. The large drive gear in the procedure is item 1 in this view. For the tape cartridge manual load procedure, follow the steps below:

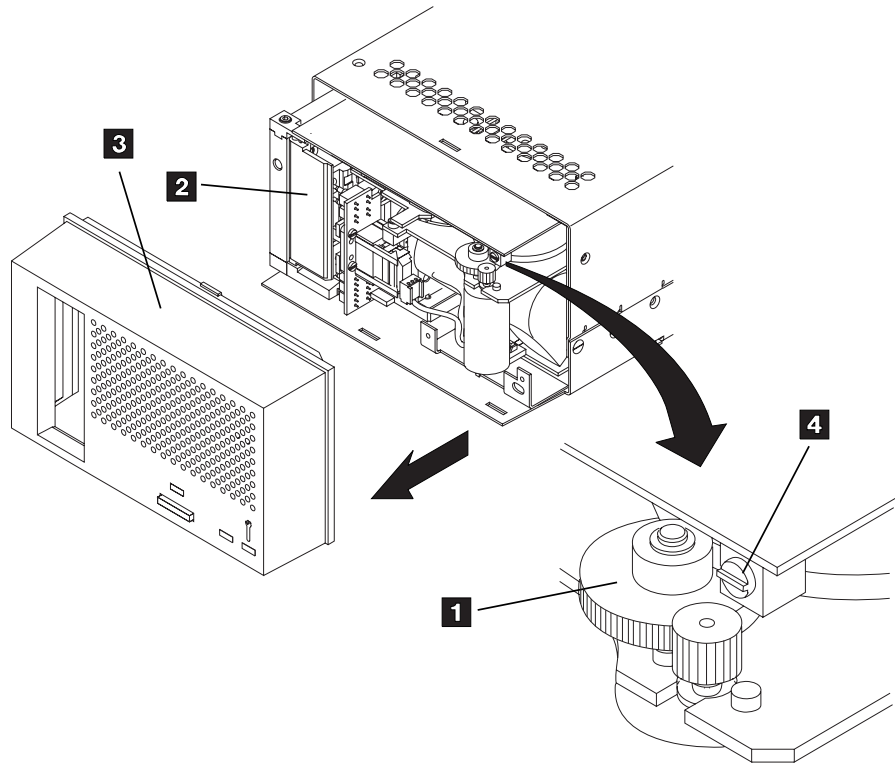
1. Power off the device if not done already.

**Note:** If testing the drive sensors, do not power off the device. Instead load a cartridge into the drive by inserting a tape cartridge into the drive door slot with the device powered on. If the drive does not load the cartridge continue with step 4 to manually load the cartridge.

2. Ensure that the drive is fully unloaded. See “Continue Manual Unload Procedure” on page PROC-24 if the drive needs to be unloaded.
3. Slowly insert a tape cartridge completely into the drive door slot, but do not force the cartridge.
4. Rotate the first intermediate drive gear, item 3, in a counter clockwise direction. This gear drives the drive loader motor gear, item 4. Rotate the gear in a counter clockwise direction until the tab, item 2, moves out from between the two sensors on the sensor assembly, and the cartridge moves into the drive.

**Note:** On some drives a metal shield prevents you from seeing the tab, item 2, from the front of the drive. You will be able to see the tab, item 2, move if you look down from the top of the drive.

When the file-protect and cartridge-type sensor, item 1, moves to the left and comes into contact with the tape cartridge, the cartridge is fully loaded.



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Figure 262. Removing a Stuck Cartridge From a Drive

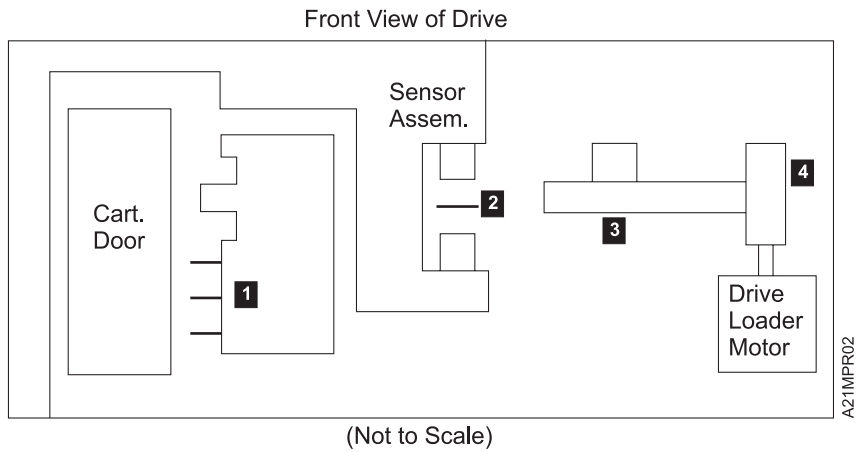


Figure 263. Drive Front View (Unloaded)

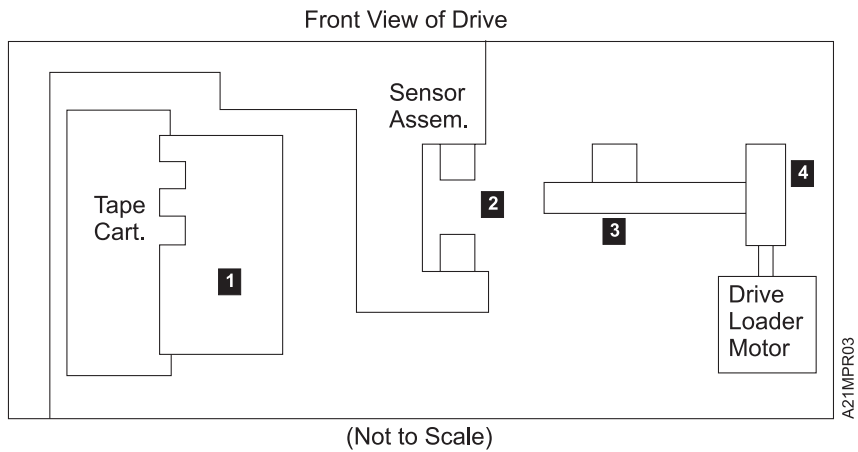


Figure 264. Drive Front View (Loaded)

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## Inserting or Removing a Cleaning Cartridge

1. Change from the default Status screen to the **Options Menu** by pressing the Enter button.
2. Select the Clean option and press Enter.
3. If inserting a cleaning cartridge in the library, go to step 5.
4. If removing a cleaning cartridge from the library, select REMOVE CLN TAPE and press Enter. The cleaning cartridge will be removed from its internal storage cell and placed in the priority cell. Remove the cleaning cartridge from the priority cell and continue with 6.
5. Select INSERT CLN TAPE and press Enter. A message will appear prompting the operator to PUT CLEANING CARTRIDGE IN PRIORITY CELL PRESS ENTER. Put the cleaning cartridge in the priority cell and press Enter. The cleaning cartridge will be loaded in the library and stored in its internal storage cell.
6. Select CANCEL to return to the **Options Menu**.

---

## Setting Automatic Cleaning

1. Because the Magstar MP will be reset at the end of this procedure, you should make sure that the drive(s) have been unloaded and that the drives are not being used by the host system.
2. Select EDIT CONFIG from the **Options Menu** and press Enter.
3. Select AUTO CLEAN from the **Edit Configuration Menu** and press Enter.

An asterisk (\*) in front of ENABLE or DISABLE indicates if automatic cleaning is enabled or disabled. The default setting is \*ENABLE. If the display shows \*ENABLE, the library unit will automatically clean the tape drive(s) when they require cleaning. If the display shows \*DISABLE, the operator must take action to clean the tape drive(s) when cleaning is required.

4. To change the configuration, move the arrow to select the desired configuration (ENABLE or DISABLE) and press Enter. If the display shows both the ENABLE and DISABLE menu options without asterisks in front, there is a mismatch in the settings for drive 1 and drive 2 (in two drive models). Select ENABLE or DISABLE and press Enter to correct the mismatch.

**Note:** When the configuration is set correctly, select CANCEL and press Enter to return to the **Edit Configuration Menu**.

5. Select CANCEL from the **Edit Configuration Menu** and press Enter.
6. Select RESET DRIVE from the **Unload and Reset Menu** and press Enter.
7. Then select PROCEED and press Enter.

The Magstar MP will reset and the status screen will be displayed.

8. Press Enter to return to the **Options Menu**.

---

## Drive Head Cleaning Procedure

**Note:** If the drive requires cleaning too frequently (for example, every day), go to Step 009 on page MAPS-23.

The need for cleaning is determined by the tape drive. The tape drive should be cleaned **only when indicated by the 3570**. Cleaning the drive too frequently with the cleaning tape may cause excessive wear of the head assembly and may lead to read and write errors.

Model B00 should be cleaned only when the Clean LED indicator on the drive bezel flashes.



Models B01, B02, B11, B12, B21 and B22 should be configured to have automatic cleaning enabled and should have the cleaning cartridge loaded into the cleaning cell. The operator should allow the 3570 tape drives to clean themselves when necessary.

Inform the operator that the 3570 should not be cleaned unless indicated. Cleaning the drive too frequently with the cleaning tape may cause excessive wear of the head assembly and may contribute to read and write errors.

The drive will normally determine if there is a reason to clean itself. The operator or CE has the option of overriding this feature any time by performing the following steps:

#### 1. Head cleaning—library device

a.

##### Notes

1. If a cartridge is loaded in the drive, the library should be put in **Manual Mode** and the drive unloaded before selecting the cleaning options on the menu. See Figure 107 on page PANEL-13 for procedure to set the device to Manual mode and to unload the drive. After cleaning, restore the library to the mode it was in before changing to Manual mode.
2. This procedure assumes that a clean cartridge is installed in the cleaner cell position.

- b. Select the CLEAN option of the **Options Menu** at the library operator panel display.
- c. Use the 'Scroll Up' or 'Scroll Down' push buttons to scroll to the CLEAN DRIVE option of the CLEAN Menu.
- d. Select the drive number to be cleaned and press Enter.
- e. The drive should automatically clean itself.

#### 1. Head cleaning—drive without library attachment

- a. Insert the cleaner cartridge into the tape drive.
- b. The drive will automatically perform the clean cycle.

**Note:** The cleaning cartridge should be replaced after 100 cleaning cycles.

---

## Cleaning Cartridge Labels

Cartridge labels cannot have folds, missing pieces, tears or any extraneous markings, including smears or smudges along the length of the label.

If the labels become dirty, wipe them with a dry, lint-free cloth. Do not use water or any chemicals to clean the label.

If a cartridge needs to be replaced, a kit containing enough labels for 10 cartridges can be ordered. See "Replacing Cartridge Labels."

---

## Replacing Cartridge Labels

If a cartridge label needs to be replaced, the customer can order a kit containing enough replacement labels for 10 cartridges (part number 05H9393).

1. Carefully peel the old labels off the cartridge. The old labels must be completely removed with no residue left behind in the recessed label area. Any left over glue residue can be easily removed by rubbing it off with your finger.

**Note:** Do not use any sharp object, water or any chemicals to clean the label areas of the cartridge.

2. The labels must be oriented on the cartridge, as shown in Figure 265 on page PROC-31. The new cartridge labels must be placed totally within the recessed area on the tape cartridge. The label must be placed flat over the length of the label and cannot have folds, missing pieces, tears or have any extraneous markings, including smears or smudges.

If the label is not placed properly, the bar code reader cannot read the bar code. Misplaced labels may also interfere with the proper operation of the drive.

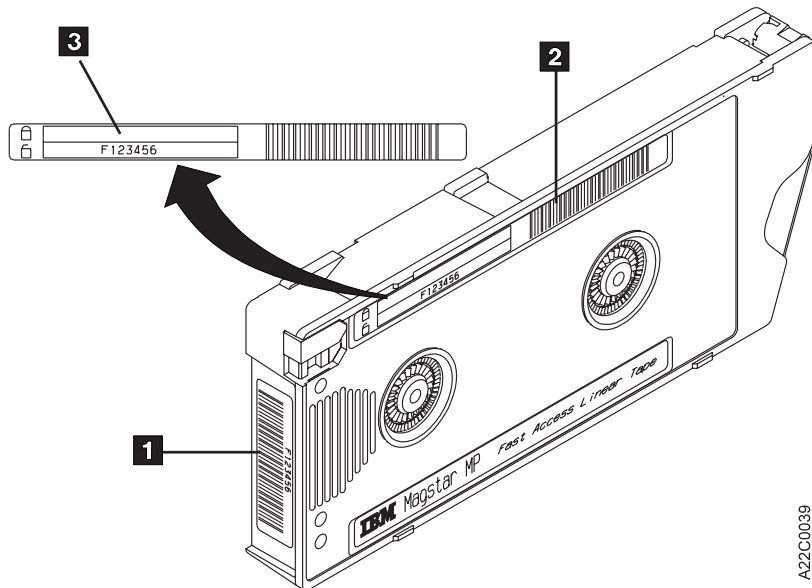


Figure 265. Label Placement on 3570 Cartridge

## Resolving Bar Code Reader Problems

If there is a mismatch between the VOLSER and the bar code label, see “Resolving a Mismatch Between the Bar Code Label and VOLSER” on page PROC-33.

If the bar code reader feature is installed, and the host displays a message stating that either the VOLSER (Volume ID) does not match or a cartridge is not found, see “Resolving a Mismatch Between the Bar Code Label and VOLSER” on page PROC-33.

If the Bar Coder Reader Feature is installed on the 3570 and cannot read the bar code label on a tape cartridge, perform the following:

1. Check the cartridge labels for folds, missing pieces, tears or any extraneous markings, including smears or smudges along the length of the label.
2. If the labels are dirty or marked, clean the labels. See “Cleaning Cartridge Labels” on page PROC-29.
3. If a cartridge label needs to be replaced, the customer can order a kit containing enough replacement labels for 10 cartridges. See “Replacing Cartridge Labels” on page PROC-29.
4. If the cartridge labels are not damaged or dirty, clean the bar code sensor which is mounted on the picker assembly. Because the sensor is located inside the picker, the picker assembly must be removed from the library in order to reach the sensor. For picker removal and replacement procedures, refer to “FID 9A: Picker Assembly” on page CARR-40. Using a cotton swab with a 4 inch or longer extension and a small amount of alcohol, gently clean the glass window of the sensor. Two or three swipes over the window area is sufficient to clean the sensor.
5. If the Bar Code Reader still does not work, replace the FRUs listed under FID 94 in Figure 8 on page START-12.

## Initializing the Tape Volume Serial Number

The cartridge label bar code on the Magstar MP cartridge is unique and is used to identify each cartridge. For Standard Label tape processing using the Bar Code Reader feature 2011, the bar code labels and internally recorded VOLSER must match. Most IBM tape management systems, like ADSM and BRMS/400, use Standard Label tape processing. To maintain compatibility with Standard Label tape processing, it is required that the operator initialize tape cartridges using the VOLSER printed on the Bar Code Label. The internal VOLSER on the tape should be identical with the external VOLSER that appears on the two matching Bar Code Labels ( 1 , 2 , and 3 in Figure 266 of each cartridge. **To use cartridges in a Magstar MP Tape Subsystem with the Bar Code Reader feature installed, the internal VOLSER must match the Bar Code Label.**

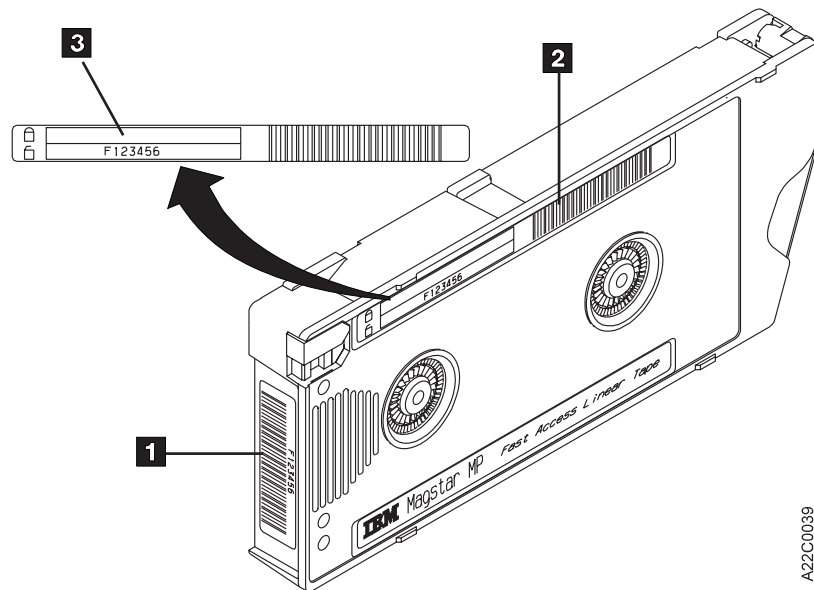


Figure 266. Magstar MP Tape Cartridge Labels

## Bar Code Format

The bar code is seven characters in length not including the start/stop characters. The first character (left-most character) is the media type character and is an uppercase "F" for all Magstar MP cartridges.

The remaining six (right most) are used to uniquely identify the cartridges. The valid bar code characters are as follows:

- Uppercase Alpha- A through Z
- Numeric - 0 through 9
- Blanks (or Spaces) - Trailing only.

The bar code can be any mixture of alpha and numeric characters such as the following:

- "FABC123" "FA1B2C3" "F123ABC"
- "F12345" (with a trailing blank character)
- "FA3B" (with 3 trailing blank characters)

The bar code is located on two labels on the Magstar MP cartridge, (items 1 , 2 and 3 in Figure 266.

Some operating systems or applications, like ADSM and BRMS/400, only display the last six characters (the "F" is not displayed).

For Standard Label tape Processing the bar code labels must match the internally recorded VOLSER.

---

## Resolving a Mismatch Between the Bar Code Label and VOLSER

If there is a mismatch between the Bar Code Label and the VOLSER that the tape was initialized with, the customer can order a set of cartridge labels to match the Bar Code Label with the internal VOLSER. To receive the replacement labels, the customer should order part number 05H9643 from IBM Supply Fulfillment Operations:

- 1-888-IBM-MEDIA in the United States, or
- +31 433 502 576 in Europe.

Refer the operator to “Replacing Cartridge Labels” in the Operator Guide for instructions explaining the procedures for removing the old labels and installing the new labels.

Instead of replacing the Bar Code Labels, the operator may choose to re-initialize the tape when the data contained on the tape has expired.

---

## Library Mode Selection

To change the operating mode of a library unit, perform the following steps in the order indicated:

1. At power on, the Status screen will be displayed. Press the Enter button to display the **Options Menu**.
2. Select SET LIBR MODE from the **Options Menu** and press the Enter button.
3. If the Magstar MP is Model B02 or B12, and the library is configured to operate in Split Configuration, select Drive 1 or Drive 2 and press Enter.
4. When the **Set Library Mode Menu** appears, use the Scroll Up and Scroll Down buttons to move the selection arrow (>) until it is pointing to the desired mode. Press the Enter button. The library unit will be set to the mode that you have selected. the **Options Menu** is displayed.
5. Select CANCEL and press Enter until the **Options Menu** is displayed.

For additional information, see “Library Modes of Operation” on page LIBRARY-5.

---

## Library Configuration Selection

Library configuration is only available on Magstar MP Models B02, B12 and B22. To change the configuration of a library unit, perform the following steps in the order indicated:

1. At power on, the Status Screen will be displayed. Press the Enter button to display the **Options Menu**.
2. Select EDIT CONFIG from the **Options Menu** and press the Enter button.
3. Select SET LIBR CONFIG from the **Edit Configuration Menu** and press Enter.
4. An asterisk (\*) in front of BASE or SPLIT indicates the configuration that is currently selected. To keep the current configuration, select CANCEL and press Enter. To change the configuration, move the arrow to select the desired configuration (BASE or SPLIT) and press Enter. Select CANCEL from the **Edit Configuration Menu** and press Enter.
5. If a cartridge is loaded in drive 1 or drive 2, select UNLOAD DRIVE from the **Unload and Reset Menu** and press Enter; otherwise continue with step 8 on page PROC-34.
6. Select the drive number to be unloaded and press Enter. The cartridge will be unloaded from the drive and the status screen will be displayed. Press Enter to return to the **Drive Selection Menu**.

7. Repeat step 6 until there are no cartridges loaded in drive 1 or drive 2. Then select CANCEL to return to the **Unload and Reset Menu**.
8. Select RESET DRIVE and press Enter.
9. Select PROCEED and press Enter.
10. The Magstar MP will reset and the status screen will be displayed. The new library configuration will be displayed on line 3 of the operator panel display. (See 16 in Figure 103 on page PANEL-5).
11. If attached to an AS/400 System, re-IPL the AS/400 IOP card(s) to which the 3570 is attached.
12. If attached to a RS/6000, you must deconfigure the Magstar MP device at the host and then reconfigure it before using the new library configuration.
13. If attached to a Sun or HP-UX system, you must de-configure the Magstar MP device at the host and then re-configure it before using the new library configuration.
14. If attached to a Windows NT system, you must re-IPL the system and allow the system to detect and re-configure the device.

---

## Pausing the Cartridge Sequence

In automatic mode, the library keeps the tape drive continually fed with cartridges. The next available cartridge is automatically loaded into the tape drive after the ejected cartridge is put back into the magazine.

The operator can pause the autoloading of cartridges into the drive by making the following selections on the Operator Panel:

1. If the status screen is displayed, press the Enter button to display the **Options Menu**.
2. Select CART SEQUENCE from the **Options Menu** and press the Enter button.
3. If the Magstar MP is a dual drive model operating in Split Configuration, select the drive number to be paused.
4. Select PAUSE SEQUENCE from the **Cartridge Sequence Menu**.

When the tape in the drive has been unloaded, the library will not automatically load the next cartridge into the drive. In order to resume operation, the operator must select START on the **Options Menu**.

This operation is available only in Automatic Mode.

---

## Resetting the Cartridge Sequence

In automatic mode and manual mode, the library processes cartridges sequentially beginning at the rightmost cell position, proceeding from right to left as viewed from the front of the library.

The operator can reset the order that the cartridges are processed by making the following selections on the Operator Panel:

1. If the status screen is displayed, press the Enter button to display the **Options Menu**.
2. Select CART SEQUENCE from the **Options Menu** and press the Enter button.
3. If the Magstar MP is a dual drive model operating in Split Configuration, select the drive number to be reset.
4. Select RESET SEQUENCE from the **Cartridge Sequence Menu**.

When the tape in the drive has been unloaded, the library will not automatically load the next cartridge into the drive. The operator can then open the library door and insert or remove cartridges from the magazines.

In order to resume operation, the operator must select **START** on the **Options Menu**. Instead of resuming operation where it left off, the library loads the first cartridge it finds in the import position beginning at the rightmost cell position.

This operation is available only in Automatic Mode or Manual Mode.

---

## Clearing Tape Drive Recover Status

When the tape drive does not know where to put a tape cartridge, it displays **RECOVER** status on the operator panel. For example, if the Magstar MP is powered off and then back on with a tape loaded in the drive, the Magstar MP does not know where to put the cartridge when it is unloaded from the drive. The tape drive goes into **RECOVER** status to allow the operator to choose where the cartridge should be moved.

To clear the **RECOVER** status:

1. Select **START** from the **Options menu**.
2. If asked, select the drive with **RECOVER** status.
3. On the **Recovery Menu**, select where the cartridge should be moved, the priority cell or one of the magazine cells (2 through 20).
4. If the priority cell is selected, the cartridge will be moved to the export position in the priority cell.
5. If one of the magazine cells is chosen, select the import or export position. The tape will be moved to the selected magazine cell and placed in the desired position.



---

## Drive Serial Number—Library Models Only

1. Switch to CE mode by pressing the Mode Change push button.
2. If you are working on a 2–drive library, select the drive number you are working on.
3. Select the **Config/Install** option.
4. Select the **Drv Serial No** option.
5. Select the **DISP SERIAL NO** option to display the current drive serial number stored in VPD memory. The serial number will display to the ASCII format:

nnnnn (Where nnnnn are decimal numbers.)

**Note:** The default value for a new card pack is set by the factory to:

SequenceNum

6. Select **CANCEL** to return to the CE DRV SER NO menu.
7. Select the **ALTER SERIAL N** option.

The VPD FIELD OFFSET menu will appear and the display will show the hex values for offsets **000** through **00B**. It will be necessary to scroll the cursor up or down to see all of the offset locations.

All of the VPD offset field data is displayed and entered in hex. (See Figure 267 on page PROC-37 for a conversion chart).

An example of a five digit (ASCII) serial number (53912) is shown below on the left, and the default value (SequenceNum ), as set by the factory, is shown on the right.

CANCEL		CANCEL	
OFFSET	VALUE	OFFSET	VALUE
	3		53
1	3	1	65
2	3	2	71
3	3	3	75
4	3	4	65
5	3	5	6E
6	3	6	63
7	35	7	65
8	33	8	4E
9	39	9	75
A	31	A	6D
B	32	B	

Offset fields **000** through **006** are always set to hex 30 (ASCII 0), and the 5 character serial number is entered into offsets **007** through **00B**.

8. Select offset **000**.

The CE VPD DATA menu will appear and the display will show, vertically, the 4 bytes (8 hex digits) for offsets **000** through **003**. It will be necessary to scroll the cursor up or down to see all 8 of the hex digits for these 4 offset locations.

The menu displays the first 4 bytes (8 digits) of the serial number vertically as follows:



CANCEL  
5  
3  
6  
5  
7  
1  
7  
5  
SAVE AND CONT

This represents the characters **S e q u** in the example above, and should be changed to:

CANCEL  
3  
  
3  
  
3  
  
3  
  
SAVE AND CONT



9. Move the cursor to the digit you want to change and press ENTER.  
**Note: You must enter the serial number in HEX values, not ASCII.**
10. The CE CHOOSE VALUE menu will appear so you can select the desired digit. Move the cursor to the desired digit and press ENTER. The data will be updated and the previous menu (CE VPD DATA) will appear.
11. Repeat steps 9 and 10 until all 4 bytes (8 digits) are correct.
12. When you have finished changing the digits in these 4 offset fields, select **Save and Cont**.
13. Select **Yes** on the CE SAVE DATA? menu.
14. The CE DRV SER NO menu will appear. Repeat steps 7 on page PROC-36 through 13 for the next 4 bytes (8 digits) of the serial number. Select offset **004** to display and update the data for offset fields **004** through **007**.
15. After offset fields **004** through **007** have been updated and saved, select offset **008** to display and update the data for offset fields **008** through **00B**.
16. After the last 4 offset fields have been updated and saved, select the **DISP SERIAL NO** option to confirm that the correct serial number is entered.
17. Select **Cancel** to return to the CE OPTIONS menu.  
**Note:** The CE WAIT menu may appear momentarily while the new serial number data is written into memory.
18. Return to the procedure that sent you here.

Figure 267. Hex to ASCII Conversion

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	Null	30	0	41	A	4A	J	54	T	61	a	6A	j	74	t
20	Space	31	1	42	B	4B	K	55	U	62	b	6B	k	75	u
		32	2	43	C	4C	L	56	V	63	c	6C	l	76	v
		33	3	44	D	4D	M	57	W	64	d	6D	m	77	w
		34	4	45	E	4E	N	58	X	65	e	6E	n	78	x
		35	5	46	F	4F	O	59	Y	66	f	6F	o	79	y
		36	6	47	G	50	P	5A	Z	67	g	70	p	7A	z
		37	7	48	H	51	Q	5F	_	68	h	71	q		
		38	8	49	I	52	R			69	i	72	r		
		39	9			53	S					73	s		

**Note:** All codes are not shown.

---

## Making FMR Tape from Scratch Tape—Library Models

This procedure creates an FMR tape from a scratch tape for library models. The scratch tape will contain the microcode that is active in the device.

1. Make a note of the library mode that the device is in. You will need to return the library to that mode when the call is complete. The mode of operation can be determined by selecting the **show status** screen on the Operator Options Menu.
2. Select **Set Library Mode** from the Operator Options Menu.
3. From the Set Library Mode Menu, select **Manual Mode**.  
**Note:** If you want to replace the microcode in the device from a field microcode replacement (FMR) tape or want to update the FMR cartridge with the microcode in the drive, go to “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.
4. Switch to CE Mode by pressing the Mode Change push button.
5. Select drive 1.
6. From the CE Options menu, select **FMR Tape**.
7. From the CE FMR Tape menu, select **Make FMR Tape**.
8. When you are prompted from the LOAD SCRATCH TAP Menu, load a scratch cartridge into the priority slot.
9. Select **START** on the LOAD SCRATCH TAP Menu.
10. When the cartridge is loaded and at ready point, press Enter and then select **PROC LOAD TAPE**
11. When the EC Levels menu is displayed, select **Cancel**.
12. Select **Unload Drive**.
13. If not labeled, label the cartridge as the FMR tape and save the cartridge in a secure place.
14. When you have finished the call, return the library to the mode that it was in before you changed it.



---

## Making FMR Tape from Scratch Tape—Drive-Only Models

This procedure creates an FMR tape from a scratch tape for drive-only models. The scratch tape will contain the microcode that is active in the device.

**Note:** If you want to replace the microcode in the device from a field microcode replacement (FMR) tape or want to update the FMR cartridge with the microcode in the drive, go to “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46.

1. Refer to the procedure at “Verify Fix—Drive-Only Models” on page PROC-9, and select Option 4 (Make FMR Tape). When you are prompted (flashing Clean LED), load a scratch tape. You will have about 20 seconds to load the tape before the routine will fail. If a cartridge is not inserted within the 20+ second window, the test will fail with the Maintenance LED on solid. Press unload to return to Operator Mode. Select CE mode again, and re-try the option.
2. There are two ways to tell if the option ended **without success**:
  - a. If the Maintenance LED comes on solid, it indicates an operational error such as the cartridge was file protected, or the cartridge was not loaded.
  - b. If a hard error is detected while running any of the options, all three LED's will begin to flash quickly in unison, then all three LED's will go **off** approximately one full second before sending out the FID message in the form of flashing LED's. The CE must keep count of the number of flashes

for each LED to determine which FID is being presented. The LED counts arrive in approximately 1-second intervals. When all the LED's flash in unison again, the count is about to begin again. This will continue until reset by power off. The FID meanings are shown in Figure 254 on page PROC-12. Refer also to Figure 253 on page PROC-11 for location of LEDs on drive-only machines.

3. If loading of the scratch tape was performed within the 20 seconds, and no other problems were encountered, option 4 is initiated and the Maintenance indicator LED continues to flash during the operation.
4. At the successful completion of the **make FMR tape** operation, the Maintenance indicator turns off and the Clean LED turns on solid. Press Unload to return to Operator Mode and press Unload again to unload the new FMR cartridge.
5. You may leave the CE Mode at any time by turning the drive power off, then on.
6. If not labeled, label the cartridge as the FMR tape and save the cartridge in a secure place.

---

## Making Scratch Tape from FMR Tape—Library Models (Unmaking FMR)

This procedure creates a scratch tape from an FMR tape for library models.

1. Make a note of the library mode that the device is in. You will need to return the library to that mode when the call is complete. The mode of operation can be determined by selecting the **show status** screen on the Operator Options Menu.
2. Select **Set Library Mode** from the Operator Options Menu.
3. Select DRIVE 1 if asked to select a drive.
4. From the Set Library Mode Menu, select **Manual** Mode.  
**Note:** If you want to replace the microcode in the device from a field microcode replacement (FMR) tape or want to update the FMR cartridge with the microcode in the drive, go to “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.
5. Press the Mode push button on the operator panel to select CE Mode.
6. Press Enter.
7. Select DRIVE 1 if asked to select a drive, then select PROCEED.
8. From the CE Options menu, select **FMR Tape**.
9. From the CE FMR Tape menu, select **Unmake FMR Tape**.
10. When you are prompted from the LOAD FMR TAP Menu, load the FMR cartridge into the priority slot.
11. Select **START** on the LOAD FMR TAP Menu.
12. When the cartridge is loaded and at ready point, select **PROC LOAD TAPE**
13. When the EC Levels menu is displayed, select **Cancel**.
14. Select **Unload Drive**.
15. If not labeled, label the cartridge as a scratch tape.
16. When you have finished the call, return the library to the mode that it was in before you changed it.



---

## Making Scratch Tape from FMR Tape—Drive-Only Models (Unmaking FMR)

This procedure cannot be performed on drive-only models. It is available only to library models. See “Making Scratch Tape from FMR Tape—Library Models (Unmaking FMR).”

---

## Updating Microcode from FMR Cartridge (Library Models)

The cartridge must not be file protected.

**Note:** If updating microcode in a 3570 Model B02, B12 or B22 update the microcode in drive 2 before updating drive 1. If you update drive 1 before drive 2, you may not be able to use this process to update drive 2. **Both tape drives in the 3570 must be at the same microcode level to operate correctly.**

If there is a mismatch in the microcode levels on tape drive 1 and tape drive 2, the microcode in tape drive 2 cannot be updated using this process. Refer to “Updating Microcode in Drive 2 from FMR Cartridge” on page PROC-45.

This procedure automatically updates the field microcode replacement (FMR) tape with the microcode from the drive if that level of microcode is not already on the FMR tape. The device is then updated with the microcode on the FMR tape.

1. Make a note of the library mode that the device is in. (Do this for both drives in a Model B02, B12 or B22.) You will need to return the library to that mode when the call is complete. The mode of operation can be determined by selecting the **Show Status** screen on the Operator Options Menu.
2. Select **Set Library Mode** from the Operator Options Menu.
3. If updating a Model B02, B12 or B22, select the drive number that you want to update.
4. From the Set Library Mode Menu, select **Manual** Mode. (If updating a Model B02 or B12 or B22, repeat steps 1 thru 4 for both tape drives.)

**Note:** If you want to create an FMR tape from a scratch tape that will contain the microcode that is active in the device, go to “Making FMR Tape from Scratch Tape—Library Models” on page PROC-39.

5. Change to CE Mode and if updating a Model B02, B12 or B22, select the drive to be updated.
6. From the CE Options menu, select **FMR TAPE**.
7. From the CE FMR TAPE Menu, select **UCODE UPDATE**.
8. When LOAD FMR TAPE Menu prompts to load a tape, load a FMR cartridge into the priority slot.
9. Scroll down and select **START** on the LOAD FMR TAPE Menu.
10. When the cartridge is loaded and at ready point, press Enter and then select **PROC LOAD TAPE**.
11. When the SELECT EC LEVEL Menu is displayed, select the desired EC level. The microcode checks to see if the FMR tape contains the microcode in the drive logic card, and if the tape does not contain the EC level, it automatically copies the microcode to the FMR tape. After action is completed, good or bad status will be displayed. If status is bad, **retry** with another cartridge or same cartridge.  
**Note:** Do not cause the machine to power off or reset while microcode update is in process.
12. From the CE Action Success Menu select **Unload Drive**.
13. Power off and power on the device to activate the microcode.
14. If updating microcode in Model B02, B12 or B22, repeat this procedure for drive 1 after the update to drive 2.
15. Record the EC level and link level of the microcode in “Microcode EC Level History Log” on page PROC-47.
16. Save the FMR cartridge in a secure place.
17. When you have finished the call, return the library to the mode that it was in before you changed it.

---

## Isolate Drive 1 or Drive 2 Communications Fault

If tape drive 1 cannot communicate with tape drive 2, or if the microcode installed in the tape drives are at different EC levels, the status ACCESSING or XFERRING is never displayed on the bottom line of the operator panel display when the library is powered up.

If the library is set to split configuration, another indication that the tape drive 1 cannot communicate with tape drive 2 is the letter “N” or a blank space at the beginning of line 3 of the library operator panel display.

Check the following:

1. **Both** power cords are plugged into the 3570 and into the AC power source.
2. Check that the drive features are set correctly. See “Set Drive Options—Library Models” on page INST-45.
3. If the library operator panel displays “CODE LVL”, the microcode levels in the drives are not the same. Update the microcode. See the procedures listed under step 8.
4. If the microcode EC levels for each of the tape drives can be read by the host and displayed, compare the microcode levels for the tape drives. If they are different, update the microcode. See the procedures listed in step 8.
5. The RS-422 cable which connects drive 1 to drive 2 is correctly plugged into the connectors on the cooling packs. If you corrected the RS-422 cable, power the library off and back on to verify that the cable fixed the problem.
6. The internal RS-422 cable is correctly plugged into the mother board on each of the drives. If you corrected the RS-422 cable, power the library off and back on to verify that the cable fixed the problem.
7. Run the RS-422 Wrap Test. See “RS-422 Port Wrap Test” on page PROC-89.
8. If the EC levels in the tape drives could not be verified, the microcode installed in drive 2 may be at a different level than the level installed in tape drive 1. Update the microcode in the tape drives using one of the following procedures:
  - “Updating Microcode from an AS/400” on page PROC-58
  - “Updating Microcode from RS/6000 by Using TAPEUTIL” on page PROC-59
  - “Updating Microcode from a Sun System by Using TAPEUTIL” on page PROC-63
  - “Updating Microcode from a HP—UX System by Using TAPEUTIL” on page PROC-65
  - “Updating Microcode from a Windows NT System Using NTUTIL” on page PROC-68
  - “Updating Microcode in Drive 2 from FMR Cartridge” on page PROC-45 followed by “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42
9. If the problem is not corrected by any of the above actions, one of the drive logic cards (FID EA), or one of the RS-422 cables (FID DE) may have failed.



---

## Swap Drive 1 and Drive 2 or Logic Cards

When a CE needs to swap Drive 1 and Drive 2 (or their drive logic cards) on a Model B02, B12 or B22 for failure isolation, the Model B02, B12 or B22 will not work as expected at microcode level I3\_28F or earlier. This problem will be corrected with drive microcode at a later level than I3\_28F.

If you have drive microcode at or earlier than I3\_28F, and you need to swap Drive 1 with Drive 2, (or their logic cards) for failure isolation, do the following:

1. Power off the 3570 and disconnect the power cords.
2. Remove the top library cover to gain access to the drive packs.
3. Disconnect the 2-wire fan power cable from each cooling pack.
4. Disconnect the power cable from each drive pack.
5. Disconnect the RS422 cable and the internal SCSI cable from each drive pack and remove the cooling packs from each drive. You can leave the SCSI cable(s) and terminator(s) connected to the cooling packs for convenience.
6. Remove the drives (or drive logic cards) from the library and swap them when reinstalling. See procedures in this section.
7. Reconnect the RS422 cable and the internal SCSI cable to each drive pack and reinstall the cooling packs on each drive.
8. Reconnect the power cable to each drive and the 2-wire fan power cable to each cooling pack.
9. Reconnect the power cords and power on the 3570. Wait for the POR cycle to complete.
10. Change to CE Mode and select drive 2:
  - a. Select UTILITIES
  - b. Select DISP/ALT VPD
  - c. Select FLASH GRP
  - d. Use the arrow buttons to scroll down to the SER DRIVE ID menu item and press ENTER. (You will need to scroll down approximately 80 menu items to reach SER DRIVE ID.)
  - e. The display should show:

```
CE VPD DATA
>CANCEL

2
```

- f. The "2" on the CE VPD DATA Menu, needs to be changed to "1". Use the arrow button to select the "2" and press ENTER.
  - g. Select "1" on the CE CHOOSE VALUE Menu and press ENTER.
  - h. Use the arrow to scroll to the SAVE AND CONT. menu item on the CE VPD DATA Menu and press ENTER.
  - i. Select YES on the CE SAVE Menu.
  - j. Select CANCEL until you return to the CE OPTIONS Menu.
11. Power the 3570 off and back on. Wait approximately 2 minutes after the power-up cycle completes.
  12. Power the 3570 off and back on once again. The 3570 should come up as Model B02.
  13. Drive 1 and 2 (or the drive logic cards) are now swapped; continue with your work to isolate and repair the failure.

**Note:** If you are testing the drives from the host, you may need to change the SCSI Addresses. Refer to the INSTALL section of the Maintenance Information for procedures to set the SCSI address.



---

## Updating Microcode in Drive 2 from FMR Cartridge

If there is a mismatch in the microcode levels on tape drive 1 and tape drive 2, the microcode in tape drive 2 cannot be updated using the process described in “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.

**Note:** The SCSI address for drive 2 is sometimes changed during this procedure because when drive 2 powers up, and drive 1 does not attempt communications (which will always happen in this procedure because drive 1 is not connected), a 5 minute timer is started by the microcode. After 5 minutes has elapsed, the drive will reset itself, and become a Model B00. A Model B00 uses the SCSI ID switch to determine the SCSI address, while the library models use VPD in the logic card to determine the SCSI address. Unless the switch setting is identical to the VPD address, the SCSI address will change. If the FMR process is completed in the 5 minute window, the address will not change. In any case, after the code is updated and both drives 1 and 2 are powered on, drive 2 will convert back to a library model, and will use VPD to determine the SCSI address.

Before returning the library to the customer, use the operator menus to verify that the SCSI address for drive 2 is set correctly.

In order to update the microcode in drive 2, perform the following:

1. Switch off power to the 3570.
2. Remove the power cord from the power supply above drive 1. Be sure to leave the power cord plugged into the power supply above drive 2.
3. Switch on power to the 3570. The library will not move and the operator panel will not display any information because these items are controlled by drive 1 (which is not powered on at this time).
4. Perform the procedure described in “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46 to load the microcode on drive 2.
5. Switch off power to the 3570.
6. Reconnect the power cord to the power supply above drive 1. Be sure to leave the power cord plugged into the power supply above drive 2.
7. Switch on power to the 3570.
8. If updating the microcode in tape drive 1, refer to “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.



---

## Updating Microcode from FMR Cartridge (Drive-Only Models)

The cartridge must not be file protected.

This procedure automatically updates the field microcode replacement (FMR) tape with the microcode from the drive if the FMR tape does not contain the microcode and updates the microcode in the device with the first available EC level of microcode on the FMR tape.

**Note:** If you want to create an FMR tape from a scratch tape that will contain the microcode that is active in the device, go to “Making FMR Tape from Scratch Tape—Drive-Only Models” on page PROC-39.

1. With the drive unloaded, press the UNLOAD push button 3 times within a 1-second interval. The Maintenance and Clean indicators start flashing.
2. Press the UNLOAD push button 2 times at one second intervals to advance to the Update Microcode From An FMR Tape option. The Maintenance and Busy indicators start flashing and the Clean LED is off.
3. Press the UNLOAD push button 2 times within a 1-second interval to select the Update Microcode From An FMR Tape option. The Busy and Clean LEDs go off.
4. The drive requests that an FMR tape cartridge be loaded by flashing the Clean LED. The microcode waits about 20 seconds for a cartridge to be loaded. The cartridge **Must Not** be file protected. If a cartridge is not inserted within the 20 second window, the test fails with the Maintenance LED on solid. Press UNLOAD to return to Operator Mode. Return to CE Mode and select the option again.
5. If a cartridge is inserted within the 20 second window, the Update Microcode From An FMR Tape procedure is started and the Maintenance indicator flashes during the procedure.
6. There are two ways to tell if the option ended without success:
  - a. If the Maintenance LED comes on solid, it indicates an operational error such as the cartridge was file protected, or the cartridge was not loaded.
  - b. If a hard error is detected while running any of the options, all three LED's will begin to flash quickly in unison, then all three LED's will go **off** approximately one full second before sending out the FID message in the form of flashing LED's. The CE must keep count of the number of flashes for each LED to determine which FID is being presented. The LED counts arrive in approximately 1-second intervals. When all the LED's flash in unison again, the count is about to begin again. This will continue until reset by power off. The FID meanings are shown in Figure 254 on page PROC-12. Refer also to Figure 253 on page PROC-11 for location of LEDs on drive-only machines.
7. If loading of the FMR tape was performed within the 20 seconds, and no other problems were encountered, the Maintenance LED will flash during the FMR update operation.
8. At the successful completion of the FMR update operation, the Maintenance indicator turns off, and after a few minutes, the Clean LED turns on solid. **Wait until the Clean LED turns on before powering the drive off.**
9. At the completion of the **read FMR tape** (ucode update) operation, power the drive off, then on to activate the microcode. The FMR tape will be unloaded.
10. Save the FMR tape cartridge in a secure place.

## Microcode EC Level History Log

Figure 268 shows how to determine the EC level and link level of the microcode from the operator Services menu. Use the link level 1 to determine the latest EC level.

If you read the EC level and link level from the FMR tape ( "Updating Microcode from FMR Cartridge (Library Models)" on page PROC-42), the link level (LL) is displayed as dddd instead of d\_ddd. The following example shows that the second entry is the latest level microcode:

```
EC=6C56789 LL=4D D
EC=3C56789 LL=5B 2 (highest EC level)
```

Figure 269 shows the EC history of the microcode where you write the EC and link levels of the microcode, the date, and the device serial number. You write the values here when you install the device, replace the card pack, or update the device to a new microcode level.

MICROCODE LEVEL >CANCEL EC aaaaaaa Link bbcd_ddd	Legend: aaaaaaa = Engineering change level bb = Product identifier c = Link identifier d_ddd = Link level <b>1</b>	A21MPR06
---	---	----------

Figure 268. Microcode Level Menu

Figure 269. Microcode EC Level History Log #1

EC Level	Link Level 1	Date	Drive Serial Number

Figure 270. Microcode EC Level History Log #2

EC Level	Link Level 1	Date	Drive Serial Number

---

## Error Log Analysis Procedure

The Error Log Analysis Procedure is designed to assist the service representative in isolation of intermittent failures, or chronic problems that seldom happen but occur often enough to cause a concern. We will use the error log to demonstrate how one might look for possible leads on which FRUs to replace in such a case. The example we will use is not a real example, but is intended for demonstration only.

Figure 271 on page PROC-50 shows a blank Error Log Analysis Work Sheet that you may make copies of and use to write down FIDs with the following procedure. Figure 274 on page PROC-52 shows the same Error Log Analysis Work Sheet with a sample extraction from the 3570 error log.

Following is an example of how you might gather and analyse error log data. The 10 entries below represent a summary of what you might find in the 3570 error log:

```
Entry 1  FID 98
Entry 2  FID 9E
Entry 3  FID 9F
Entry 4  FID C5
Entry 5  FID BF
Entry 6  FID CA
Entry 7  FID C5
Entry 8  FID A8
Entry 9  FID 9F
Entry 1  FID 98
```

In a real situation, you would extract the error log FID data and fill out the blank Error Log Analysis Work Sheet using the following procedure. Our example has all the data recorded for your convenience:

**Note:** When you have concluded reading out the error log, reset the device by power off then on.

1. Take the FID from the most recent error log entry and put it in the first column labeled **Error Log FID Entries**, row one, (FID 98 in our example). Continue listing FIDs that you find in the error log until you get to the last one you choose to use in the analysis.

**Note:** If the time stamp shows a long duration between one entry and the next, you may want to ignore any of the older entries for the purpose of this exercise.

2. Refer to "FID Entry Point" on page START-12, under the table column **Reported FID** and locate the first FID that you extracted from the error log and wrote down in the left column of your work sheet. To the right of that entry on the work sheet, under **START Section FRU Names (FID Numbers)**, list from left to right, in order of listed probability, the FRU that is called out under the column **FRU Name** in the START pages. To save space, use the FID number that is associated with each FRU. A cross reference of FRU Names to FID Numbers may be found in Figure 272 on page PROC-51, and a cross reference of FID Numbers to FRU Names may be found in Figure 273 on page PROC-51. In the top line of our example, we listed FIDs 9A, A3, 97 and A5.
3. Repeat the previous step for each FID you wrote down on the work sheet. When all has been written down, continue with the next step.
4. Look first in the left two or three columns of your Error Log Analysis Work Sheet, under the **START Section FRU Names (FID Numbers)** and draw a circle around the FID that appears most often (in our example we circled FID 9A five times).
5. Next, look in the left two or three columns and draw a square around the next FID that occurs the most often (in our example we drew a square around FID BC, four times).
6. Now, look at the overall entries, and draw a diamond around any FID that occurs most often (in our example we drew a triangle around FID 97.)

**Note:** FID 97 only occurred in the columns in the right-hand portion of the work sheet, but that is because it was considered a low probability of failure when taken one FID at a time. If a FID occurs often, but always falls in a low probability position, That FID may be causing the problems but due to limitations of error logging, it never shows up as a high probability of being the failure. This error log analysis procedure is intended to show up some of these problems.

7. Last, look up the FID number and associated names of the FRUs they represent (in our example, the three FIDs are listed under **Legend**). Now use your training, intuition, or experience to decide which FRU is most likely to be causing the problem. In our example, the likely failing FRU might be the picker assembly, the loader assembly, or the library control card. A decision at this time might be to replace the FID 9A FRU (the picker assembly) first for the following reasons:

a. FID 9A occurs most often of all high probability FIDs (5 times), and its position is, in all cases, in the high probability area (left most three columns). It does, however, have a medium variation.

**Note:** Variation is used here to define a measure of how often a FID occurs exactly the same way in a given error log sample. For example, if the FID 9A had occurred as the first FID after a FID 98 all five times instead of how it did occur, it would have a small variation or a high correlation. Small variation (similar to high correlation) **Error Log FID Entries** tend to point to those FIDs as the most likely failing components. Large variation (similar to low correlation) **Error Log FID Entries** tend to point to those FIDs as **not** the most likely failing components.

b. The FID BC occurs quite often, but has a slightly lower probability based upon which column it appears. FID BC has a slightly smaller variation in the Error Log FID Entries, which may point to it as the failing component.

c. The FID 97 seems to be a medium probability due to its position in the middle columns (that are used), but has the greatest variation in the Error Log FID Entries.

Had the FID BC had a very small variation in the Error Log FID Entries (such as only one or two different FIDs), or appeared in a slightly higher probability of failure position (some entries in the left-most column), it might have been selected as the FRU to replace first. Had the FID 97 had a smaller variation in the Error Log FID Entries (such as only one or two different FIDs), it might have been selected as the FRU to replace first.

These decisions must rely heavily on your experience and knowledge of the device, the timing of the errors that occurred, error history of this device, and your customer environment.

## Error Log Analysis Work Sheet

Error Log FID Entries	START Section FRU Names (FID Numbers) (Enter starting with Highest Probability on Left)												

A21MCEL1

Figure 271. Blank Error Log Analysis Work Sheet

*Figure 272. FRU Name to FID Number Cross Reference*

<b>FRU Name</b>	<b>FID Number</b>
Accessor Assembly	92
Accessor Motor Assembly	95
AC Power Cord	DC
AC Switch and Cable Assembly	DB
Cleaner Cartridge- Present Sensor	A3
Cooling Pack	B2
Drive Analog Card	EB
Drive Cooling Fan	BE
Drive Global Sensor Pair	9B
Drive LED Card	B1
Drive Logic Card	EA
Drive Sensor Cable	DA
Drive Servo Card	EC
Head -Actuator Assembly	D0
Internal SCSI Cable	CB
Library Control Card	97
Library Door Open Sensor	AA
Library Front Cover Assembly	9D
Library Interface Cable	A2
Library LED Card	A6
Library Magazine	FD
Library Sensor Cable	A5
Library Operator Panel Display	90
Library Operator Panel Display Cable	91
Loader Assembly	BC
Loader Door	B0
Loader Door Open Sensor	C9
Loader home Sensor	CA
Loader Sensors	DD
Magazine 1 Sensor	A1
Magazine 2 Sensor	A0
Magazine Global Sensor Pair	9C
Mother Board	E9
Picker Cable	99
Picker Assembly	9A
Power Supply	C1
Priority Cell Cartridge- Present Sensor	9E
RS-422 Cable- Internal to Drive	DE
Tape Cartridge	FE

*Figure 273. FID Number to FRU Name Cross Reference*

<b>FID Number</b>	<b>FRU Name</b>
90	Library Operator Panel Display
91	Library Operator Panel Display Cable
92	Accessor Assembly
95	Accessor Motor Assembly
97	Library Control Card
99	Picker Cable
9A	Picker Assembly
9B	Drive Global Sensor Pair
9C	Magazine Global Sensor Pair
9D	Library Front Cover Assembly
9E	Priority Cell Cartridge- Present Sensor
A0	Magazine 2 Sensor
A1	Magazine 1 Sensor
A2	Library Interface Cable
A3	Cleaner Cartridge- Present Sensor
A5	Library Sensor Cable
A6	Library LED Card
AA	Library Door Open Sensor
B0	Loader Door
B1	Drive LED Card
B2	Cooling Pack
BC	Loader Assembly
BE	Drive Cooling Fan
C1	Power Supply
C9	Loader Door Open Sensor
CA	Loader home Sensor
CB	Internal SCSI Cable
D0	Head -Actuator Assembly
DA	Drive Sensor Cable
DB	AC Switch and Cable Assembly
DC	AC Power Cord
DD	Loader Sensors
DE	RS-422 Cable- Internal to Drive
E9	Mother Board
EA	Drive Logic Card
EB	Drive Analog Card
EC	Drive Servo Card
FD	Library Magazine
FE	Tape Cartridge

## Error Log Analysis Work Sheet

Error Log FID Entries	START Section FRU Names (FID Numbers) (Enter Starting with Highest Probability on Left)											
98	9A	A3	97	A5								
9E	9E	A5	97									
9F	9A	BC	99	97	EA	CA	A5					
C5	FE	BC	EC									
BF	EA	BE										
CA	CA	EC	DA									
C5	FE	BC	EC									
A8	FD	9A	99	97								
9F	9A	BC	99	97	EA	CA	A5					
98	9A	A3	97	A5								

**Legend:**

9A=Picker Asm.  
BC=Loader Asm.  
97=Library Control Card

A21MCEL2

Figure 274. Example—Error Log Analysis Work Sheet



---

## Set Error Match Trap (To Get a Dump)

**RS/6000 Note:** The AIX Tape and Medium Changer Device Driver provides an automatic dump facility. It automatically reads a dump from the 3570 when it is available and stores the dump in a directory on the RS/6000 system. See the Problem Determination chapter in the *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for more information.

The dump icon ! appears when the dump is available and remains on the screen to indicate that trace data is stored in the device. When the trap is **hit**, an ATTENTION DRIVE FSC Trap Taken message is displayed on the operator panel. If a FID1 E5 occurs, that may overlay the ATTENTION DRIVE message, but the dump icon will still be displayed, and the ATTENTION DRIVE message will be underneath.

**Attention:** *Normal* error match traps are volatile and are lost if you reset the drive, switch off power to the device or microcode recovery occurs (via Check-1, FMR, etc.). *Saved* error match traps cannot be lost by a drive reset, power off, or microcode recovery, and require a special procedure for removal. Please see procedure "Remove Error Match Trap" on page PROC-54 for details.

To set an error match trap:

1. Press the Change Mode push button to place the drive in CE mode.
2. Select the drive number.
3. Select **PROCEED**.
4. Select **UTILITIES** from the CE OPTIONS Menu.
5. Select **UCODE TRAP** from the CE UTILITIES Menu.

After the CE Microcode Trap menu is displayed, four characters matching the desired error code (FSC) must be entered. Select each character and modify to the desired value.

6. With the CE UCODE TRAP Menu still selected there will be 4 options presented:
  - a. ADD FSC TRAP
  - b. REMOVE FSC TRAP
  - c. LIST FSC TRAPS
  - d. SAVED TRAPS

There are two options available to set the trap:

Use option **a** - Select **ADD FSC TRAP** which saves the *normal* trap until the next code reset. Selection of this option ends the procedure. Skip to step 10 for completion of the procedure.

Or use option **d** - Select **SAVED TRAPS** to save the *saved* trap in the drive until it is manually removed. A code reset will not eliminate a *saved* trap from the drive. See procedure "Remove Error Match Trap" on page PROC-54 for removal of a saved FSC trap.

7. Selection of the **SAVED TRAPS** option from the CE Microcode Trap menu will cause the CE SAVED TRAPS Menu to be displayed next.
8. Select **ADD SAVED FSC TRAP** from the CE SAVED TRAPS Menu to save the trap.
9. Select BACK TO CE MEN to return to the **CE Saved Traps Menu**.
10. Select **CANCEL** to return to the previous CE menu. Repeat this step as needed to return to previous CE menus.
11. Perform "End of Call" on page PROC-15 or return to the procedure that sent you here.

**Note:** Only three **saved** traps can be active at a time. If more than three are selected, the procedure will not be successful. To see how many saved traps are active, select **SAVED TRAPS** from the CE UCODE TRAP Menu and then select the **LIST SAVED FSC TRAPS** option.

---

## Remove Error Match Trap

**Note:** This procedure is similar to procedure “Set Error Match Trap (To Get a Dump)” on page PROC-53, except that it removes the trap(s) set in the previous procedure. See the definition of *normal* trap versus *saved* trap in procedure “Set Error Match Trap (To Get a Dump)” on page PROC-53.

1. Press the Change Mode push button to place the drive in CE mode.
2. Select the drive number.
3. Select **PROCEED**.
4. Select **UTILITIES** from the CE OPTIONS Menu.
5. Select **UCODE TRAP** from the CE UTILITIES Menu.

At this point it is necessary to distinguish between removal of a *normal* trap or a *saved* trap. If the trap is known to be *normal*, go to heading “Remove NORMAL Trap.” If the trap is known to be *saved*, go to heading “Remove SAVED Trap” on page PROC-55. If the *type* of trap is unknown, but the error code is known, proceed as follows:

- a. Select **SAVED TRAPS** from the CE UCODE TRAPS Menu
- b. Select **LIST SAVED FSC TRAPS** from the CE SAVED TRAPS Menu. The list is displayed.
- c. Check the list of Saved FSC traps for a match of the error code.
- d. If there is no match, the trap is presumed to be *normal*. Select **CANCEL** twice to return to the CE UCODE TRAP Menu. Skip to heading “Remove NORMAL Trap.”
- e. If there is a match, then select the appropriate error code.
- f. Select **REMOVE SAVED FSC TRAP** from the CE FSC TRAP LIST Menu. Success or failure of the CE action will be indicated on the Op panel. Select **BACK TO CE MEN** to return to the **CE Saved Traps Menu**.
- g. Select **CANCEL** twice to return to CE UCODE TRAP Menu. Repeat this step as needed to return to previous CE menus.

This completes removal of a known, saved FSC trap.

6. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.

## Remove NORMAL Trap

**Known Normal Error Code:** If the error code is unknown, go to heading “Unknown Normal Error Code” on page PROC-55. With the error code **known**, proceed:

1. With the CE UCODE TRAPS Menu still selected, four characters matching the error code (FSC) must be set. Select each character and modify to the desired value.
2. Select the **REMOVE FSC TRAP** option from the CE UCODE TRAPS Menu. The Op panel will indicate success or failure of the CE action.
3. Select **CANCEL** to return to CE UTILITIES Menu and repeat this step as needed to return to the previous CE menu.

This completes removal of a known, normal FSC trap.

4. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.

### Unknown Normal Error Code

1. With the CE UCODE TRAPS Menu displayed, select **LIST FSC TRAPS**. The list is displayed.
2. Select the error code to be removed (from the list).
3. Select **REMOVE FSC TRAP** from the CE REMOVE FSC TRAP Menu. The Op panel will indicate success or failure of the CE action.
4. Select **CANCEL** to return to the CE UCODE TRAPS Menu. Repeat this step as needed to return to previous CE menus.

This completes removal of an unknown, normal FSC trap.

5. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.

### Remove SAVED Trap

**Known Saved Error Code:** If the error code is unknown, go to “Unknown Saved Error Code.” With the error code **known**, proceed:

1. From the CE UCODE TRAPS Menu (still displayed), select **SAVED TRAPS**.
2. The CE SAVED TRAPS Menu is selected. Four characters matching the error code (FSC) must be set. Select each character and modify to the desired value.
3. Select the **RMV SAVED FSC TRAPS** option from the CE SAVED TRAPS Menu. The Op panel will indicate success or failure of the CE action.
4. Select **CANCEL** to return to CE UCODE TRAP Menu. Repeat this step as needed to return to previous CE menus.

This completes removal of a known, saved FSC trap.

5. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.

### Unknown Saved Error Code

1. From the CE UCODE TRAPS Menu (still displayed), select **SAVED TRAPS**.
2. Select **LIST SAVED FSC TRAPS** from the CE SAVED TRAPS Menu. The list is displayed.
3. Select the error code to be removed (from the list).
4. Select **RMV SAVED FSC TRAPS** from the CE FSC TRAP LIST Menu. The Op panel will indicate success or failure of the CE action.
5. Select **CANCEL** to return to the CE SAVED TRAPS Menu. Repeat this step as needed to return to previous CE menus.

This completes removal of an unknown, saved FSC trap.

6. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.

---

## Offloading Dumps from 3570 to Tape Cartridge (Library Models)

**Note:** Be sure to offload dumps for both drive 1 and drive 2 in Models B02, B12 and B22. Both dumps can be copied to the same scratch tape.

The dump icon ! appears when the dump is available and remains on the screen to indicate that dump data is stored in the device.

**Attention:** Dump data is volatile and is lost if you switch off power to the device.

**RS/6000 Note:** The AIX Tape and Medium Changer Device Driver provides an automatic dump facility. It automatically reads a dump from the 3570 when it is available and stores the dump in a directory on the RS/6000 system. See the Problem Determination chapter in the *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for more information.

1. Make a note of the library mode that the device is in. You will need to return the library to that mode when the call is complete. The mode of operation can be determined by selecting the **show status** screen on the Operator Options Menu.
2. Select **Set Library Mode** from the Operator Options Menu.
3. From the Set Library Mode Menu, select **Manual Mode**.
4. Press the Change Mode push button to place the drive in CE mode.
5. Select the drive number that you are copying the dump from.
6. Select **DUMP** from the CE OPTIONS Menu.
7. Select **CPY DMP TO TAP** to copy a dump from dynamic random access memory (DRAM) to a tape cartridge.
8. Select **WRT DMP BOT** if you want to copy the first dump to tape. Select **WRT DMP AT EOD** if you want to add a second dump to the tape.
9. When you are prompted from the LOAD SCRATCH TAP Menu, load a scratch cartridge into the priority slot and select **LOAD FROM PRIO**.
10. When the cartridge is loaded and at ready point, press Enter and then select **PROC LOAD TAPE**.

A screen indicates the status of the copy to medium (Successful Copy or Unsuccessful Copy).

11. Select **UNLOAD DRIVE** to remove the cartridge.
12. When the dump to tape has completed, contact your next level of support for further instructions.

The dump icon ! disappears from the 3570 operator panel when the dump to tape has completed.

13. When you have finished the call, return to Operator Mode and put the library in the mode that it was in before you changed it.

---

## Offloading Dumps from 3570 to Tape Cartridge (Drive-Only Models)

**RS/6000 Note:** The AIX Tape and Medium Changer Device Driver provides an automatic dump facility. It automatically reads a dump from the 3570 when it is available and stores the dump in a directory on the RS/6000 system. See the Problem Determination chapter in the *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for more information.

1. Refer to “Verify Fix—Drive-Only Models” on page PROC-9 and select Option 6. When you are prompted (flashing Clean LED), load a scratch tape. You will have about 20 seconds to load the tape before the routine will fail. If a cartridge is not inserted within the 20+ second window, the test will fail with the Maintenance LED on solid. Press unload to return to Operator Mode. Select CE mode again, and re-try the option.
2. There are two ways to tell if the option ended without success:
  - a. If the Maintenance LED comes on solid, it indicates an operational error such as the cartridge was file protected, or the cartridge was not loaded.
  - b. If a hard error is detected while running any of the options, all three LED's will begin to flash quickly in unison, then all three LED's will go **off** approximately one full second before sending out the FID message in the form of flashing LED's. The CE must keep count of the number of flashes for each LED to determine which FID is being presented. The LED counts arrive in approximately 1-second intervals. When all the LED's flash in unison again, the count is about to begin again. This will continue until reset by power off. The FID meanings are shown in Figure 254 on page PROC-12. Refer also to Figure 253 on page PROC-11 for location of LEDs on drive-only machines.
3. You may leave the CE Mode at any time by selecting Option 1, or by turning the drive power off, then on.
4. At the successful completion of a **Write Dump to Tape** operation, unload the drive.
5. Contact your next level of support for further instructions.

---

## Updating Microcode from an AS/400

Microcode load for the 3570 tape drives directly attached to an AS/400 with the SCSI is obtained from the AS/400 using the program temporary fix (PTF) process.

**Note:** If the Magstar MP Model B02 or B12 is in Split Configuration, microcode update is not supported using the PTF process. The microcode must be updated according to the instructions in “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42. If both drives in a Magstar MP Model B02 or B12 are attached to the same AS/400 system (Base Configuration), both drives will be updated with new microcode at the same time when the PTF is applied. **Both tape drives in the Magstar MP must be at the same microcode level for the library to operate correctly.**

1. Determine if any PTFs are required for attachment of the Magstar MP 3570. The PTFs for all supported AS/400 releases are listed in INFO APAR II10363. This info APAR contains the most current PTF information for all supported releases and important information concerning the attachment of the 3570 to the AS/400.
2. Notify the customer that a microcode load for the Magstar MP 3570 is available via a PTF.
3. The customer will apply the PTF.
4. Before the customer applies the PTF(s) and IPLs the input/output processor (IOP), verify that the drive(s) in the 3570 are unloaded and not being used by the AS/400.
5. The PTFs can now be applied and the IOP can be IPLed. The IPL causes the 3570 microcode load to proceed.
6. When the microcode load is complete, the drive performs a soft power-on reset (restarts the code).

### Important

Wait at least 6 minutes (12 minutes for a Model B02 or B12) after the IOP has finished with its IML before powering off or resetting the drive. If the drive is powered off or reset before the drive completes its power-on sequence, the drive logic card may be damaged.

**Note:** If an error occurs, a message should be displayed that the error occurred. Whether successful or not, **the drive will be reset** by the device microcode. To verify that the load occurred as expected, refer to “Microcode EC Level History Log” on page PROC-47 to verify the level that actually loaded.

7. If the load was successful, update the account FMR cartridge. See “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.

---

## Offloading Dumps from 3570 Attached to AS/400

Use the “Offloading Dumps from 3570 to Tape Cartridge (Library Models)” on page PROC-56 procedure.

---

## Updating Microcode from RS/6000 by Using TAPEUTIL

You may require assistance from the customer during this process.

**Note:** If updating microcode in a Magstar MP 3570 Model B02 or B12, update the microcode in drive 2 **before** drive 1. **Both tape drives in the 3570 must be at the same microcode level for the library to operate correctly.**

This procedure downloads microcode to the tape drive from a file or diskette. This diskette must be in AIX/UNIX format. The Microcode Load utility is only supported on the IBM 3570 and 3590 tape drives.

1. Verify that the drive(s) are unloaded.
2. Verify that the drive(s) are not in use by another host.
3. Insert the diskette with the microcode load into the system diskette reader.
4. Start the tape utility program by typing **tapeutil** at the prompt.
5. Select Tape Drive Service Aids from the menu by selecting **Tape Drive Service Aids** option and pressing Enter.
6. Select **Microcode load** from the following panel then press **Enter**.

```
IBM Tape Device Service Aid Menu                                7

Select One of the Service Aids to be performed

Force Microcode Dump
  Perform a microcode dump of the system. The dump is stored in
  the device.
  After the dump is performed it must be read using Read Dump.
Read Dump
  Transfer a dump from the tape device to a host file, diskette or
  a tape cartridge.
Microcode load
  Download microcode from host file or diskette to tape device via
  SCSI bus.
Error Log Analysis
  Analyze system error log for device.
F3=Cancel                                F1 =Exit
```

7. Select a **Device** and press **F7=Commit** from the following panel. You must press **F7=Commit** after selecting the drive.

```
IBM Tape Device Selection Menu.                                9

Select One of the devices listed below.

NAME          LOCATION    TYPE
rmt2          - 5- 1-1    IBM 357  Tape Drive and Medium Changer
rmt3          - 5- 1 3    IBM 357  Tape Drive and Medium Changer

F3=Cancel          F7=Commit          F1 =Exit
```

- If loading the microcode from the diskette reader, press **F7=Commit** from the following panel. Otherwise, enter the **path** and **filename** and press **F7=Commit**.

Enter the filename **/xxx.yyyy** in the source field where xxx.yyyy is the filename of the microcode file to be loaded. For example, type **/762.fmrz**.

You must press **F7=Commit** after entering the filename.

```

Prompting for Srce File for Operation on rmt3 located at      5- 1-3
                                     B
Please enter the following fields...
Enter Filename:                                           /dev/rfd +/
F1=Help           F2=Refresh           F3=Cancel           F4=List
F5=Reset          F7=Commit            F1 =Exit

```

- While the microcode load takes place, the display shows:

```

Operation running, please stand by

```

- When the microcode load completes, the initiator display shows:

```

Operation completed successfully!

```

The drive performs a soft power-on reset (restart the code).

**Note:** If an error occurs, a message should be displayed that the error occurred. Whether successful or not, **the drive will be reset** by the device microcode. To verify that the load occurred as expected, refer to “Microcode EC Level History Log” on page PROC-47 to verify the level that actually loaded.

- Press **F10** to exit the microcode load.
- Press **q** to quit tapeutil.
- Remove the diskette from the diskette reader.
 

**Note:** You must have root authority to do the following step.
- Update the VPD data in the host RS/6000 by unconfiguring the device (**Example: rmdev -l rmt3**) and reconfiguring the device (**Example: mkdev -l rmt3**).
- If updating microcode in a Magstar MP 3570 Model B02 or B12, repeat these steps to update the microcode in drive 1 after drive 2 has been updated.
- If the load was successful, update the account FMR cartridge. See “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42.



---

## Offloading Dumps from 3570 to RS/6000 by Using TAPEUTIL

**Note:** Be sure to offload dumps for both drive 1 and drive 2 in Models B02 and B12.

The dump icon ! appears when the dump is available, and remains on the screen to indicate that trace data is stored in the device.

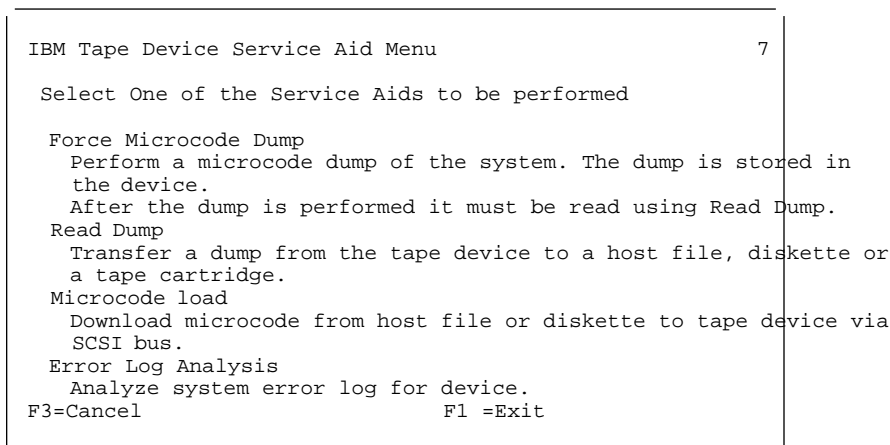
**Note:** Trace data is volatile and is lost if you switch off power to the device.

**RS/6000 Note:** The AIX Tape and Medium Changer Device Driver provides an automatic dump facility. It automatically reads a dump from the 3570 when it is available and stores the dump in a directory on the RS/6000 system. See the Problem Determination chapter in the *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers Installation and User's Guide GC35-0154* for more information.

You may require assistance from the customer during this process.

This procedure reads a dump from the 3570 and writes it to a diskette in AIX/UNIX format.

1. On the drive operator panel, verify that the drive is Online.
2. Verify that the drive is unloaded.
3. Verify that the drive is **not in use** by another host.
4. Insert the diskette that will be used for the dump in the system floppy diskette reader.
5. When the prompt appears, format the diskette by typing **format** and pressing enter.
6. Start the tape utility program by typing **tapeutil** at the prompt.
7. Select **Tape Drive Service Aids** option from the menu and press **Enter**.
8. Select **Read Dump** from the following panel and then press **Enter**.



```
IBM Tape Device Service Aid Menu                                7
Select One of the Service Aids to be performed

Force Microcode Dump
  Perform a microcode dump of the system. The dump is stored in
  the device.
  After the dump is performed it must be read using Read Dump.
Read Dump
  Transfer a dump from the tape device to a host file, diskette or
  a tape cartridge.
Microcode load
  Download microcode from host file or diskette to tape device via
  SCSI bus.
Error Log Analysis
  Analyze system error log for device.
F3=Cancel                                F1 =Exit
```

9. Select a **Device** and press **F7=Commit** from the following panel. You must press **F7=Commit** after selecting the drive.

```

IBM Tape Device Selection Menu.                                     9
Select One of the devices listed below.

NAME          LOCATION      TYPE
rmt2          - 5- 1-1      IBM 357 Tape Drive and Medium Changer
rmt3          - 5- 1-3      IBM 357 Tape Drive and Medium Changer

F3=Cancel          F7=Commit          F1 =Exit

```

10. At the next screen press **F7=Commit** to write the file to the diskette.

```

Prompting for Dest File for Operation on rmt3 located at         - 5- 1-3
      B

Please enter the following fields...

Enter Filename:                                               /dev/rfd +/

F1=Help          F2=Refresh          F3=Cancel          F4=List
F5=Reset          F7=Commit          F1 =Exit

```

11. Press **F10** to exit the read dump.

The dump icon ! disappears from the 3570 operator panel when the dump to tape has completed.

12. Press **q** to quit tapeutil.

13. Remove the diskette from the diskette reader. The dump diskette created above is in AIX/UNIX format.

## Updating Microcode from a Sun System by Using TAPEUTIL

### TAPEUTIL

Refer to APPENDA for more information on using *tapeutil* in the Sun (Solaris) system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154.

You may require assistance from the customer during this process.

**Note:** If updating microcode in a 3570 Model B02 or B12, update the microcode in drive 2 **before** drive 1. Then update the microcode in drive 1. **Both tape drives in the 3570 must be at the same level for the library to operate correctly.**

The IBM 3570 and 3590 support downloading a new microcode image from the host system via the SCSI bus. This procedure down-loads microcode to the tape drive from a file or diskette. This diskette must be in AIX/UNIX format.

To download microcode to these devices, perform the following steps;

1. Verify that the IBM tape subsystem is powered ON and online.
2. Verify that the drive does not currently have a tape cartridge loaded.
3. Determine the current version of microcode present on the device by entering the following command, substituting **n** with the actual value from the device special file associated with the target device:

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o qmc -v
```

4. Determine the source of the new microcode image file (that is, floppy diskette such as /vol/dev/aliases/floppy0 or host file such as /tmp/ucode\_image.file).
5. Enter the following command, substituting **file** with the actual path and filename of the microcode image file, and substituting **n** with the actual value from the device special file associated with the destination device:

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o dmc -z file -v
```

**Note:** The microcode download procedure may also be performed using the menu-driven interface of the **tapeutil** program. To invoke the **tapeutil** program in this format, enter the following command, and then choose **option 1** to open the device, followed by **option 4** to query the current device microcode level, and **option 7** to download new microcode:

```
/opt/IBMtape/tapeutil
```

**Note:** If an error occurs, a message should be displayed that the error occurred. Whether successful or not, **the drive will be reset** by the device microcode. To verify that the load occurred as expected, refer to "Microcode EC Level History Log" on page PROC-47 to verify the level that actually loaded.

---

## Offloading Dumps from 3570 to a Sun System by Using TAPEUTIL

### TAPEUTIL

Refer to APPENDA for more information on using *tapeutil* in the Sun (Solaris) system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154.

The 3570 and 3590 support forcing a diagnostic dump and storing that dump to a mounted tape cartridge or to a host system file via the SCSI bus.

**Note:** Be sure to offload dumps for both drive 1 and drive 2 in Models B02 and B12.

The dump icon ! appears when the dump is available, and remains on the screen to indicate that trace data is stored in the device.

#### Notes:

1. Trace data is volatile and is lost if you switch off power to the device.
2. If you force a dump when the dump icon ! is already displayed, the existing trace data will be overlaid by the new trace data.

You may require information from the customer during this process.

To force and store a diagnostic dump on these devices, perform the following steps:

1. Verify that the IBM tape subsystem is powered ON and online.
2. Enter the following command to force the dump, substituting **n** with the actual value from the device special file associated with the target device:  

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o fdp -v
```
3. Determine the location for the dump to be stored (that is, floppy diskette such as /vol/dev/aliases/floppy0 or host file such as /tmp/diag\_dump.file)
4. Enter the following command, substituting **file** with the actual path and filename of the dump destination file, and substituting **n** with the actual value from the device special file associated with the dump device:  

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o sdp -z file -v
```

5. The dump may also be written to a tape cartridge mounted in the dump device by using **tapedrive** for **file**.

**Note:** The diagnostic dump procedure may also be performed using the menu-driven interface of the **tapeutil** program. To invoke the **tapeutil** program in this format, enter the following command, and then choose **option 1** to open the device, followed by **option 5** to force a dump, and **option 6** to store the dump:

```
/opt/IBMtape/tapeutil
```

## Updating Microcode from a HP—UX System by Using TAPEUTIL

### TAPEUTIL

Refer to APPENDA for more information on using *tapeutil* in the HP—UX system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154.

You may require assistance from the customer during this process.

**Note:** If updating microcode in a 3570 Model B02 or B12, update the microcode in drive 2 **before** drive 1. Then update the microcode in drive 1. **Both tape drives in the 3570 must be at the same level for the library to operate correctly.**

The IBM 3570 and 3590 support downloading a new microcode image from the host system via the SCSI bus. This procedure down-loads microcode to the tape drive from a file or diskette. This diskette must be in AIX/UNIX format.

To download microcode to these devices, perform the following steps:

1. Verify that the IBM tape subsystem is powered ON and online.
2. Verify that the drive does not currently have a tape cartridge loaded.
3. Determine the current version of microcode present on the device by entering the following command, substituting **n** with the actual value from the device special file associated with the target device:

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o qmc -v
```

4. Determine the source of the new microcode image file (that is, floppy diskette such as /vol/dev/aliases/floppy0 or host file such as /tmp/ucode\_image.file).
5. Enter the following command, substituting **file** with the actual path and filename of the microcode image file, and substituting **n** with the actual value from the device special file associated with the destination device:

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o dmc -z file -v
```

**Note:** The microcode download procedure may also be performed using the menu-driven interface of the **tapeutil** program. To invoke the **tapeutil** program in this format, enter the following command, and then choose **option 1** to open the device, followed by **option 4** to query the current device microcode level, and **option 7** to download new microcode:

```
/opt/IBMtape/tapeutil
```

## Offloading Dumps from 3570 to a HP—UX System by Using TAPEUTIL

### TAPEUTIL

Refer to APPENDA for more information on using *tapeutil* in the HP—UX system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154.

The 3570 and 3590 support forcing a diagnostic dump and storing that dump to a mounted tape cartridge or to a host system file via the SCSI bus.

**Note:** Be sure to offload dumps for both drive 1 and drive 2 in Models B02 and B12.

The dump icon ! appears when the dump is available, and remains on the screen to indicate that trace data is stored in the device.

#### Notes:

1. Trace data is volatile and is lost if you switch off power to the device.
2. If you force a dump when the dump icon ! is already displayed, the existing trace data will be overlaid by the new trace data.

You may require information from the customer during this process.

To force and store a diagnostic dump on these devices, perform the following steps:

1. Verify that the IBM tape subsystem is powered ON and online.
2. Enter the following command to force the dump, substituting **n** with the actual value from the device special file associated with the target device:  

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o fdp -v
```
3. Determine the location for the dump to be stored (that is, floppy diskette such as /vol/dev/aliases/floppy0 or host file such as /tmp/diag\_dump.file)
4. Enter the following command, substituting **file** with the actual path and filename of the dump destination file, and substituting **n** with the actual value from the device special file associated with the dump device:  

```
/opt/IBMtape/tapeutil -f /dev/rmt/nst -o sdp -z file -v
```

5. The dump may also be written to a tape cartridge mounted in the dump device by using **tapedrive** for **file**.

**Note:** The diagnostic dump procedure may also be performed using the menu-driven interface of the **tapeutil** program. To invoke the **tapeutil** program in this format, enter the following command, and then choose **option 1** to open the device, followed by **option 5** to force a dump, and **option 6** to store the dump:

```
/opt/IBMtape/tapeutil
```

## Starting NT UTILITY (ntutil) from a Windows NT System

### NTUTIL

Refer to APPENDA for more information on using *ntutil* in the Windows NT system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide GC35-0154*.

You may require assistance from the customer during this process.

**Note:** If updating microcode in a 3570 Model B02 or B12, update the microcode in drive 2 **before** drive 1. Then update the microcode in drive 1. **Both tape drives in the 3570 must be at the same level for the library to operate correctly.**

1. This is a common start, open, and close procedure.
2. Click the **Start** icon.
3. Click on the **Program**.
4. Click on the **Command Prompt**

The cursor will be at the right of the default prompt **C:\>** Any data that is read will be stored in that drive/directory and any data written will try to originate from the same drive/directory. If you wish to read or write to or from a different drive/directory then enter **cd newdir** (where newdir is a fully qualified valid drive and dir) to change to the new directory.

5. Enter **ntutil**
6. The following menu will appear on the screen.

```
Manual Test:
Batch Test:
Exit ntutil:
  Enter Command:
```

7. Select **Manual Test**

The Manual Menu will appear see Figure 275 on page PROC-68.

8. Select Open by its number **20** open.

```
SYNTAX: open device-file RW
          $D          RO
```

```
where RW means read/write
      RO means read only
```

```
for example,
  open RW          means open default device tape
  open $D RO      means open device specified by -d option
  open tape RO    means open device tape
```

If the special file \$D is specified, the -d value must be given on the command line, and will be substituted for \$D.

9. **\*\*\*** Select the desired test to run by it's number. **\*\*\***

Run the appropriate test(s) and complete the necessary task(s).

**\*\*\*** Then you will return here to finish the call. **\*\*\***

10. Select close **21** and enter.
11. After tests are complete, quit the **Command Prompt** window by clicking on the **X** in the upper right hand corner of the screen.

12. Call completed see "End of Call" on page PROC-15.

BASE MODE

```
Test tool version x.x.x.x
Variable settings
===== BASE MODE =====
gp->fd =-1 gp->fd1=-1 block size=1 24 block count=1
hex block id =
return_error_when_fail 1 exit_on_unexpected_result trace_flag

manual test menu:
=====
 1: set device special file          2: display symbols
 3: set block size R/W (now ! fixed) 4: set block count (R/W)
 5: set return error when fail       6: set/reset trace
 7: set exit on unexpected result    8: Library Mode
=====
 2 : open                          21: close
22: read                          23: write
24: read and display block         25: flush (buffer->media)
26: read block id                 27: erase
28: locate block id               29: display block data
=====
 3 : write filemark(s)             31: rewind
32: forward space filemark(s)     33: unload
34: reverse space filemark(s)     35: load (359 System Mode)
36: forward space record(s)       37: return error
38: reverse space record(s)       39: test unit ready
43: set media parms (block size)  44: set dev parms (compression)
46: get device information
48: get medium information         49: inquiry
53: space EOD                     54: display message
=====
 7 : system command
=====
 8 : Force Dump                   81: Read Dump
82: Update Code                   83: Log Sense
84: Get Last Sense                85: Get Version
86: Associative/Persistent WProtect 87: Read/Write Test
88: Find Devices                  89: Get MTDevice info
=====
99: return to main menu
=====
enter selection:
```

Figure 275. Base Mode

## Updating Microcode from a Windows NT System Using NTUTIL

### NTUTIL

Refer to APPENDA for more information on using *ntutil* in the Windows NT system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide GC35-0154*.



| You may require assistance from the customer during this process.

| **Note:** If updating microcode in a 3570 Model B02 or B12, update the microcode in drive 2 **before** drive  
| 1. Then update the microcode in drive 1. **Both tape drives in the 3570 must be at the same**  
| **level for the library to operate correctly.**

| The 3570 support downloading a new microcode image from the host system via the SCSI bus. This  
| procedure down-loads microcode to the tape drive from a file or diskette.

| **Note:** The microcode download procedure may be performed using the menu-driven interface of the ntutil  
| program. To invoke the ntutil program in this format go to the common start: followed commands:  
| option 20 to open the device, followed by option 85 to query the current device microcode level,  
| and option 82 to download new microcode:

- | 1. Verify that the IBM tape subsystem is powered ON and on-line.
- | 2. Verify that the tape drive does not currently have a tape cartridge loaded.
- | 3. Start ntutil and open the drive! See 1 on page PROC-67 for procedure.
- | 4. Determine the current version of microcode present on the device by entering the following command  
| **85** (Get Version).
- | 5. Update the code by entering the following command **82** (Update Code).  
| Ntutil will prompt you for the code level.
- | 6. Enter the code level (**d0i9\_430**) for example.  
| This command will call the device driver DeviceControl() entry point and load the new ucode.
- | 7. Go to close routine and finish 10 on page PROC-67.



## | **Offloading Dumps from 3570 to Windows NT System Using NTUTIL**

### | **NTUTIL**

| Refer to APPENDA for more information on using *ntutil* in the Windows NT system environment. For a  
| complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library*  
| *Device Drivers: Installation and User's Guide GC35-0154.*

| **Note:** The dump procedure may be performed using the menu-driven interface of the ntutil program. To  
| invoke the ntutil program in this format, enter the common commands and option 80 to Force  
| Dump:

| Remember the dump goes to the default drive/directory.

- | 1. Verify that the IBM tape subsystem is powered ON and online.
- | 2. Verify that the tape drive currently has a tape cartridge loaded.
- | 3. Start ntutil and open the drive! see 1 on page PROC-67 for procedure.
- | 4. Determine the current version of microcode present on the device by entering the following command  
| **85** (Get Version).
- | 5. Force the dump by entering the following command **80** (Force Dump)

| If operation completed successful (Message **Error\_Success**) then go to end of test 11 on  
| page PROC-67 else go to Start Page. "SCSI Bus Problem Determination" on page PROC-86.

## Exercising a Drive Attached to a Windows NT System Using NTUTIL

### NTUTIL

Refer to APPENDA for more information on using *ntutil* in the Windows NT system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide GC35-0154*.

**Note:** The drive exercise procedure may be performed using the menu-driven interface of the *ntutil* program. To invoke the *ntutil* program in this format, enter the common commands and option 87 to Read/Write Test:

Remember the read/write test writes on the tape. **Use a scratch tape.**

1. Verify that the IBM tape subsystem is powered ON and online.
2. Verify that the tape drive currently has a scratch tape cartridge loaded.
3. Start *ntutil* and open the drive. See 1 on page PROC-67 for procedure.
4. Either do a **rewind** (31) or a **test unit ready** (39) to clear not ready to ready status. IF status is present, NTUTIL will issue a 1110 (ERROR\_MEDIA\_CHANGED) message.
5. Read and write on the tape by using the following command **87** (Read/Write Test).

If operation completed successful (Message **Error\_Success**) then go to end of test 11 on page PROC-67 else go to Start Page. "SCSI Bus Problem Determination" on page PROC-86.

## Checking the SCSI Attachment in a Windows NT Environment

### NTUTIL

Refer to APPENDA for more information on using *ntutil* in the Windows NT system environment. For a complete update on device driver software, see *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide GC35-0154*.

**Note:** The 3570 must be powered ON before the Windows NT device power is switched ON.

If the 3570 power is **not** ON when the Windows NT power is switched ON, the Windows NT device will not recognize the 3570. If the 3570 power is switched ON **after** the Windows NT device power has been switched ON, the Windows NT device will still not recognize the 3570.

**Note:** The sense procedure may be performed using the menu-driven interface of the *ntutil* program. To invoke the *ntutil* program in this format enter the common commands, item 83 to Force the Log of Sense, and item 84 Get Last Sense.

To test out the SCSI interface execute a force sense followed by a Get last sense:

1. Verify that the IBM tape subsystem is powered ON and online.
2. Verify that the tape drive currently has a tape cartridge loaded.
3. Start *ntutil* and open the drive! see 1 on page PROC-67 for procedure.
4. Execute the following command **83** (Log Sense).
5. Read the sense information by executing the following command **84** (Get Last Sense).

| If operation completed successful (Message **Error\_Success**) then go to end of test 11 on  
| page PROC-67 else go to SCSI Wrap Test “SCSI Bus Problem Determination” on page PROC-86.

PROC

## Mapping Element Addresses to Physical Locations

Each physical location capable of holding a tape cartridge is assigned an element address value. The physical cartridge locations and their element address values are shown in Figure 276. ( Figure 276 is a top view of the library with the back at the top of the figure.)

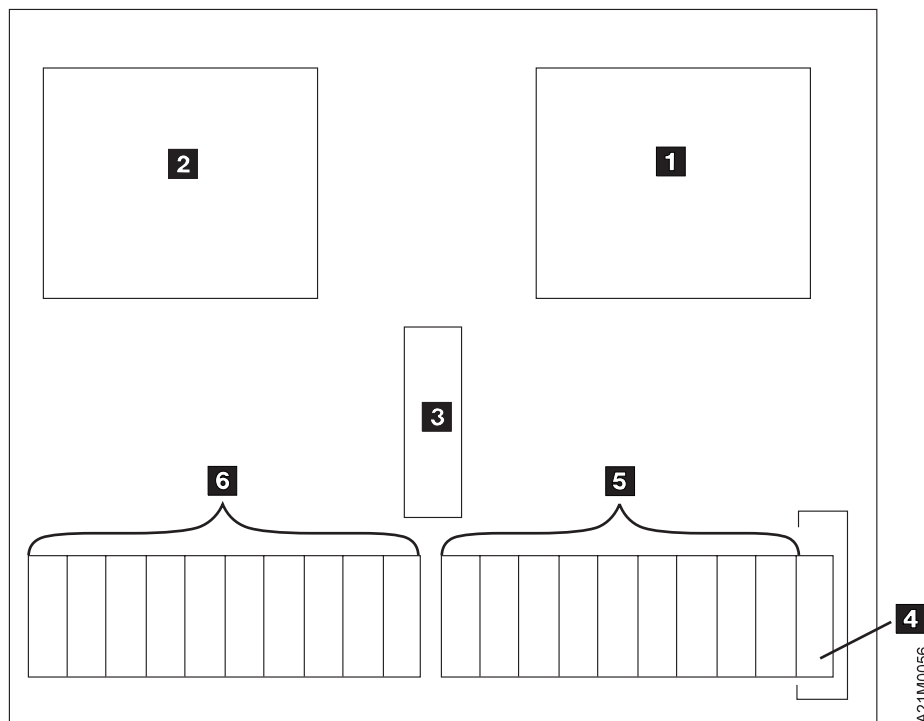


Figure 276. Magstar MP Element Address

- |   |  |
|---|--|
| 1 Drive 1 (Data Transfer, Element Address 16)               | 5 Magazine 1 excluding Priority Cell (Storage, Element Addresses 32-40 from right to left) |
| 2 Drive 2 (Data Transfer, Element Address 17)               | 6 Magazine 2 excluding Priority Cell (Storage, Element Addresses 41-50 from right to left) |
| 3 Transport Mechanism (Medium Transport, Element Address 0) |  |
| 4 Priority Cell (Import/Export, Element Address 31)         |  |

The SCSI-2 model assumes that each physical component has one unique element address and that all elements are visible to all hosts. SCSI-2 does not directly discuss library segmentation which occurs in a Split Configuration. Segmentation results in a subset of the library physical components becoming unavailable to a host. To handle library segmentation, the following rules apply:

1. The element address mapping (as indicated in Figure 276) is unchanged for a Split Configuration.
2. If a physical component is unavailable to a host because of Split Library configuration, the element address associated with that physical component is also unavailable as reflected in Mode Page X'ID' (Element Address Assignment) and in the response to a Read Element Status command.
3. Mode Page X'1F' (Device Capabilities) is unchanged for a Split Configuration.
4. For a Move Medium command or Reserve command, the elements which are unavailable are treated as invalid element addresses. Any attempt to access or reserve an unavailable element results in a CHECK CONDITION status.

## Checking the SCSI Attachment in an AS/400 Environment

If you are having problems with your connection to an AS/400, review the following **Hints** for possible causes, then continue with the SCSI checkout:

### AS/400 Hints:

PTFs are required prior to attaching a 3570 Magstar MP Tape Subsystem to an AS/400 system. The PTFs for all supported AS/400 releases are listed in INFO APAR II10363. This info APAR contains the most current PTF information for all supported releases and important information concerning the attachment of the 3570 MAGSTAR MP Tape Subsystem to the AS/400.

After installing the appropriate PTFs, a SAVSYS must be done to ensure the new IOP code is available during a system recovery.

The FC 2729 adapter shares a Combined Function IOP with the communications subsystems. Resetting the 2729 will disrupt the associated communications adapters.

Whenever possible, create the Magstar MP configuration by performing an IPL of the I/O processor after attaching it to the Magstar MP. Ensure that the AS/400 system value for Autoconfigure Devices is set to on. The I/O processor may be IPLed by varying off and varying on with reset or by using the System Service Tools (STRSST). Refer to the *Application System/400 Service Functions User's Guide* for information about the System Service Tools.

For Alt-IPL ("D" IPL) use Automatic or Manual Mode. Random mode can be used after XPF has been installed and the device configurations have been created or restored. When using BRMS/400, follow the recovery report.

When upgrading or installing a new release of OS/400 the 3570 must be in Automatic or Manual mode.

Base and Split configurations are supported. When switching between Base and Split configuration the I/O processor must be reloaded. To reload the I/O processor, vary off and vary on with reset or use STRSST to IPL the I/O processor.

In Base configuration, each tape drive must be set to a different SCSI address.

### For Operating System/400 V3R1 and V3R2:

The Magstar MP will be configured as TAPxx, where xx is number of the next tape device.

A library device must be created to operate in Random mode.

The VFYTAP command must be run in MANUAL mode or AUTOMATIC mode. Inconsistent results happens when run in Random mode.

### For Operating System/400 V3R6 and V3R7:

The Magstar MP configuration will consist of both a tape device (TAPxx), and a library device (TAPLIByy for V3R6; TAPMLByy for V3R7), where xx is number of the next tape device and yy is number of the next library device.

The system will configure with TAPLIByy or TAPMLByy as varied on.

- To run with TAPLIByy or TAPMLByy library configurations, Magstar MP must be in Random mode.
- When not running in library mode, vary TAPLIByy or TAPMLByy off and vary TAPxx on.
- **Never** have both TAPLIByy or TAPMLByy and TAPxx varied on at the same time.

Run the VFYTAP command in MANUAL mode or AUTOMATIC mode.

### BRMS/400 Requirements

The Magstar MP tape cartridges must be initialized prior to using them with BRMS. Use the INZTAP command with the Magstar MP in Automatic mode.

For OS/400 releases V3R1 and V3R2, the library device must be placed in "hold" status when switching from Random mode to Automatic or Manual mode. Use the WRKDEVBRM command to hold/release the library device.

## AS/400 SCSI Checkout

To verify that a 3570 is attached properly to an AS/400, do the following:

1. Type **WRKCFGSTS \*DEV ASTLVL(\*BASIC)** at the prompt. The following screen appears, which shows all of the attached tape device names. In this example, TAP13 1 is the device name to use for VFYTAP.

```
Work with Tape Devices
System: 12345678
Type options below, then press Enter.
 1=Make available   2=Make unavailable   5=Display details
 7=Display message  8=Work with controller  9=Rename
13=Change description

Opt Device      Type   Status
TAPM1.B1      357   Unavailable (use Opt 1)
TAP 1         638   Unavailable (use Opt 1)
TAP 2         349   Unavailable (use Opt 1)
TAP 3         349   Unavailable (use Opt 1)
TAP 9         639   Unavailable (use Opt 1)
TAP1         348   Unavailable (use Opt 1)
TAP11        348   Unavailable (use Opt 1)
TAP13 1      357   Available to use
TAP14        639   Unavailable (use Opt 1)
TAP15        638   Unavailable (use Opt 1)
TAP16        639   Available to use
TAP17        638   Available to use

Bottom

F1=Help  F3=Exit  F5=Refresh  F9=Command line  F11=Display descriptions
F12=Cancel  F17=Top  F18=Bottom  F21=Select assistance level
```

**Note:** If the Magstar MP is not recognized by the host, re-IPL the AS/400 IOP card to which the Magstar MP is attached. Ensure that the AS/400 System Value for Autoconfigure Devices is set to **on**.

2. Press F12 to get a command line.
3. Type **VFYTAP** (the Verify Tape command) on the AS/400 command line.
4. Type **tap13**, the device associated with the 3570 tape device.
5. Select the **Basic read/write test 2** option on the Tape Device Test Menu and follow the instructions provided.

```
AJCUHQV2                               Tape Device Test Menu

Select one of the following:

  1. Basic read/write test  2
  2. Read/write reliability test
  3. Exit test menu  3

Selection
-
F3=Exit
```

The following screen is displayed when the verification test completes successfully:

```
AJCUHQV3      Tape Problem Analysis
               The verification test completed successfully.
               Press Enter to continue.
```

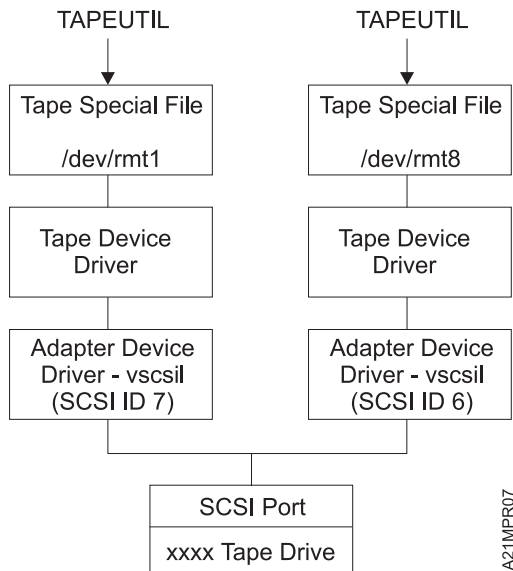
6. When the Tape Device Test menu is displayed, select **Exit test menu** 3 .



## Checking the SCSI Attachment in an AIX Environment

The devices must be fully installed and the host device drives must be configured and available. If you are not familiar with RS/6000, you may want to ask the system operator to **configure** and **make available** the drive or drives you wish to test if this has not been done before. See *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154 for information about installing and using the IBM SCSI tape drive, medium changer, and library device drivers. Also, "Installation and Configuration Instructions" in the above guide describes the *smit* and *cfgmgr* commands.

Figure 277 shows an example of the software and hardware paths that are used in the following tests. The figure illustrates unique SCSI *initiator* addresses for a configuration with more than one initiator sharing a SCSI bus.



**Note:** The SCSI port of a 3570 is connected to two hosts. The host drivers are configured so that one initiator is at SCSI address 7 and one initiator is at SCSI address 6. The tape special file names on each host are independent and may be different.

Figure 277. Host Attachment Example

## Inquiry Command

- To check installed tape devices, type the **lsdev -Cc tape** command. From the listing of devices, remember the ones you are to test. In the following example, device *rmt0* is *defined* 1 to the host, but is not available. Device *rmt1* is *available*, which indicates it can communicate with the host. The SCSI port address of the devices 2 are also shown. The example in the following text refers to the device as *rmt1*. If you do not know which devices to test, ask the customer's system administrator.

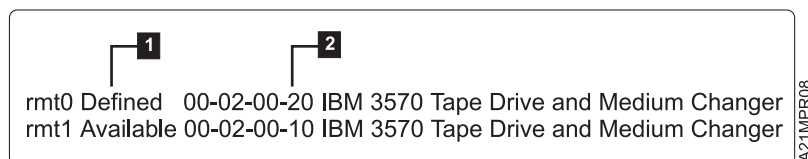


Figure 278. AIX Display of Tape Devices

- Type **tapeutil** and the following menu appears:



```

General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device         6. Test Unit Ready       1 . Mode Sense Page
 3. Device Info           7. Reserve Device       11. Release Device
 4. Tape Drive Service Aids 8. Request Sense        Q. Quit Program

Medium Changer Commands:
12. Element Information    16. Move Medium
13. Position To Element   17. Load/Unload Medium
14. Element Inventory     18. Initialize Element Status
15. Prevent Medium Removal 19. Allow Medium Removal

Tape Commands:
 2 . Query/Set Parameters  3 . Read and Write Tests
21. Load Tape             31. Unload Tape
22. Rewind                32. Erase
23. Erase Gap             33. Write Filemarks
24. Forward Space Filemarks 34. Backward Space Filemarks
25. Forward Space Records  35. Backward Space Records
26. Space to End of Data   36. Query/Set Tape Position
27. Log Sense              37. Library Sequence Number
28. Display Message       38. Read or Write Files
29. Synchronize Buffers   39. Recover Buffer Data

Enter Selection:

```

3. At the **Enter Selection:** prompt, type **1** to open a device.
4. At the **Enter the device special file name:** prompt, type **/dev/rmt1** (or your actual device).
5. At the **Select mode (1=Read/Write, 2=Read Only, 3=Write Only, 4=Append):** prompt, type **1** to receive the **Opening device...** prompt.
6. At the **Hit any key to continue...** prompt, press Enter.

```

General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device         6. Test Unit Ready       1 . Mode Sense Page

```

7. At the **Enter Selection for /dev/rmt1:** prompt, respond with **5** to receive the **Issuing inquiry...** and the following data:

**Note:** The display in this step may not match the example exactly.

```

Inquiry Data, Length 127

      1 2 3 4 5 6 7 8 9 A B C D E F 123456789ABCDEF
- 18  2 2 33      38 4942 4D2  2 2  2 2      ..3..8IBM
1 - 3 33 3539 3 45 3 31 3 33 3539 3 42 3131      357 B11 357 B11
2 - 3344 32 1 4353 3 3  3 3  3 3  3 3  3 31      3D2.CS      1
3 - 3632 2 41 C      18  4D  61 1 82D  61 1  62 A.....Pa..Pa.
4 - 8 D                      61 1  .Pa.. a..Pa..Pa.
5 - 2D          Example      .Pa..Pa.....
6 -
7 -

```

8. At the **Hit any key to continue...** prompt, press Enter. If the Inquiry Command fails, continue diagnosis at "SCSI Bus Problem Determination" on page PROC-86.

```

General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device         6. Test Unit Ready       1 . Mode Sense Page

```

9. At the **Enter Selection for /dev/rmt1:** prompt, type **2**.

The system response is **Device closed...**

## Read and Write Tests

Load a scratch cartridge in the 3570 before you start this test.

**Attention:** This test overwrites any data or tape label on the tape.

1. If the response from the previous test is **Hit any key to continue...**; press Enter. Otherwise, type **tapeutil** to restart.

```
General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device        6. Test Unit Ready       1 . Mode Sense Page
```

2. At the **Enter Selection:** prompt, type **1**.
3. At the **Enter the device special file name:** prompt, type **/dev/rmt1** (or your specific device).
4. At the **Select mode (1=Read/Write, 2=Read Only, 3=Write Only, 4=Append):** prompt, type **1**.  
At the **Opening device...** and the **Hit any key to continue...** prompts, press Enter.

```
General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device        6. Test Unit Ready       1 . Mode Sense Page
 3. Device Info           7. Reserve Device       11. Release Device
 4. Tape Drive Service Aids 8. Request Sense        Q. Quit Program

Medium Changer Commands:
12. Element Information   16. Move Medium
13. Position To Element  17. Load/Unload Medium
14. Element Inventory    18. Initialize Element Status
15. Prevent Medium Removal 19. Allow Medium Removal

Tape Commands:
 2 . Query/Set Parameters  3 . Read and Write Tests
```

5. At the **Enter Selection for /dev/rmt1:** prompt, type **30**.
6. At the **Select test (1=Read/Write, 2=Read Only, 3=Write Only):** prompt, type **1**.
7. At the **Hit <Enter> for default 10240 block size or enter new block size:**, type **262144** to ensure that the adapter device driver *vsc1* is properly installed and configured.
8. At the **Hit <Enter> for default 20 blocks per read/write or enter new blocks:** prompt, type **1**.
9. At the **Hit <Enter> for default 1 repetition or enter new repetition:** prompt, press Enter.

The following data is displayed:

```
Read/Write test, blocksize 262144 count 1 repetition 1
Setting block size...
```

```
Read/Write test pass 1
Writing 262144 bytes, 1 blocks...
Write complete, bytes written 262144, blocks 1
Writing 2 file marks...
Backward spacing 2 file marks...
Backward spacing 1 records...
Reading 262144 bytes, 1 blocks...
Read complete, bytes read 262144, blocks 1
Forward spacing file mark...
Data verification complete, no discrepancies found
```

```
Read/Write test completed, total bytes written 262144
```

10. At the **Hit any key to continue...** prompt, press Enter.

```
General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device        6. Test Unit Ready       1 . Mode Sense Page
```

11. At the **Enter Selection for /dev/rmt1:** prompt, type **2**.

At the **Device closed... Hit any key to continue...** prompt, press Enter.

```
General Commands:
 1. Open a Device          5. Inquiry                9. Log Sense Page
 2. Close a Device        6. Test Unit Ready       1 . Mode Sense Page
```

12. At the **Enter Selection:** prompt, type **q** to stop the tapeutil program.

---

## Checking the SCSI Attachment in a Sun Environment

### TAPEUTIL

Refer to *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide* GC35-0154 for details of the **tapeutil** program in the Sun (Solaris) system.

| The devices must be fully installed and the host device drives must be configured and available before  
| *tapeutil* can operate.

| **Note:** A synopsis of the commands may be found in "TAPEUTIL in a Sun (Solaris) System Environment"  
| on page APPENDA-2.

| To verify that the device driver and the devices are functional, use the **tapeutil** program, which is provided  
| with the *IBM SCSI Tape and Medium Changer Device Driver for Solaris*.

Figure 277 on page PROC-76 shows an example of the software and hardware paths that are used in the following tests.

1. Load a scratch tape cartridge in the IBM 3570.  
**Attention:** This test overwrites any data or label existing on the tape cartridge.
2. Type **/opt/IBMTape/tapeutil**. The menu shown in Figure 279 on page PROC-81 will appear. (This menu reappears at the completion of each command.)

IBM SCSI TAPE & MEDIUM CHANGER UTILITY PROGRAM	
<b>GENERAL COMMANDS</b> 1: Open Device 2: Close Device D: Device Type M: Menu Refresh Q: Quit Program	<b>BASIC SCSI COMMANDS</b> 9: Test Unit Ready 1 : Inquiry 11: Request Sense 12: Reserve 13: Release
<b>SERVICE COMMANDS</b> 3: Query Serial Number 4: Query Microcode Level 5: Force Dump 6: Store Dump 7: Download Microcode 8: Format Cartridge	<b>MEDIUM CHANGER COMMANDS</b> 14: Move Medium 15: Position To Element 16: Element Information 17: Inventory 18: Audit 19: Lock/Unlock Door
<b>TAPE DRIVE COMMANDS</b>	
2 : Read Data 21: Write Data 22: Write File Mark 23: Erase Tape 24: Rewind 25: Retension 26: Offline 27: Load/Unload Tape 28: Forward Space File 29: Backward Space File 3 : Forward Space Record 31: Backward Space Record	32: Locate End Of Data 33: Get Record Size 34: Set Record Size 35: Get Device Status 36: Get Device Info 37: Get Media Info 38: Get Position 39: Set Position 4 : Get Parameter 41: Set Parameter 42: Sync Buffer 43: Display Message

Figure 279. TAPEUTIL Program Menu

- At the **Enter Selection:** prompt, select **1** to open the device.
- At the **Enter device special file name:** prompt, type **/dev/rmt/1st** (or the actual device special file for your device).
- At the **Select mode (1=read-write, 2=read, 3=write, 4=append):** prompt, type **1**. The **Device opened** response is displayed.
- At the **Enter Selection:** prompt, select **10** to receive the device inquiry data. The inquiry data follows:

**Note:** Your data may differ. This is only an example.

```

The IOC_INQUIRY ioctl succeeded.      (EXAMPLE)

The inquiry data is:

  1 8   2 2 33      38 49 42 4d 2  2  2  2  2
 3  33 35 39 3  42 31 31 2  2  2  2  2  2  2
34 44 3  33 54 55 2  2  2  2  2  2  2  3  3  3
32 39 3  2  3      81

```

- At the **Enter Selection:** prompt, select **9** to verify device test-unit ready. The response is:

```
The IOC_TEST_UNIT_READY ioctl succeeded.
```

8. At the **Enter Selection:** prompt, select **21** to perform write verification.
9. At the **Enter block size:** prompt, type **1024**.
10. At the **Enter blocking factor:** prompt, type **256**.
11. At the **Enter megabytes to write:** prompt, type **10**.
12. At the **Enter pattern file name:** prompt, press Enter.
13. At the **Enter random seed:** prompt, type **0**. The response is:

```
Generated 262144 bytes of random data using seed 7892.  
  
Transferred 1 MB in 1.98 seconds for rate of 5.16MB/second.
```

14. At the **Enter Selection:** prompt, select **24** to rewind the tape. The response is:

```
The STIOC_TAPE_OP ioctl succeeded.
```

15. At the **Enter Selection:** prompt, select **20** to perform read verification.
16. At the **Enter block size:** prompt, type **1024**.
17. At the **Enter blocking factor:** prompt, type **256**.
18. At the **Enter megabytes to write:** prompt, type **10**. The response is:

```
Transferred 1 MB in 2.19 seconds for rate of 4.69MB/second.
```

19. At the **Enter Selection:** prompt, select **24** to rewind the tape. The response is:

```
The STIOC_TAPE_OP ioctl succeeded.
```

20. At the **Enter Selection:** prompt, select **2** to close the device. The **Device closed** response is displayed.
21. At the **Enter Selection:** prompt, select **Q** to exit the tapeutil program.

---

## Checking the SCSI Attachment in a HP-UX Environment

### TAPEUTIL

Refer to *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide* GC35-0154 for details of the **tapeutil** program in the HP-UX system.

The devices must be fully installed and the host device drives must be configured and available.

Figure 277 on page PROC-76 shows an example of the software and hardware paths that are used in the following tests. The figure illustrates unique SCSI *initiator* addresses for a configuration with more than one initiator sharing a SCSI bus.

**Note:** In this example, the SCSI port of the 3570 is connected to two hosts. The host drivers are configured so that one initiator is at SCSI address 7 and one initiator is at SCSI address 6. The tape special file names on each host are independent and may be different.

Refer to "TAPEUTIL in a HP-UX System Environment" on page APPENDA-9 and perform the following commands using the command details in that section:

1. Inquiry Command
2. Read and Write Tests

At the conclusion of the test, at the **Enter Selection:** prompt, type **q** to stop the tapeutil program.

---

## Checking the SCSI Attachment in a Windows NT Environment

### NTUTIL

Refer to *IBM SCSI Tape Drive, Medium Changer, and Library Device Drivers: Installation and User's Guide*, GC35-0154 for details of the **tapeutil** program in the Windows NT system.

**Note:** The 3570 must be powered ON before the Windows NT device power is switched ON.

If the 3570 power is **not** ON when the Windows NT device power is switched ON, the Windows NT device will not recognize the 3570. If the 3570 power is switched ON **after** the Windows NT device power has been switched ON, the Windows NT device will not recognize the 3570.

---

## SCSI Port Wrap Test

Use **only** P/N 05H9163 for the SCSI wrap test; using the wrong wrap tool may cause the 3570 to not run the wrap test.

**Note:** Wrap tool P/N 05H9163 is not shipped with the machine but is available from your service branch.

To perform the SCSI wrap test on Drive 1, continue at “SCSI Wrap Test—Drive 1.” To perform the SCSI wrap test on Drive 2, continue at “SCSI Wrap Test—Drive 2.”

### SCSI Wrap Test—Drive 1

1. Set the power switch to the Off position.
2. Disconnect the SCSI cables and terminators from Drive 1 before attaching the wrap tool.
3. Install the SCSI wrap tool in either of the SCSI connectors on drive 1.  
**Note:** When you switch off power to the 3570, wait approximately 5 seconds before you switch on power again.
4. Set the power switch to the On position. The wrap test runs automatically.  
This power-on test takes approximately 2.5 minutes to complete.
5. On library models, if the wrap tool is detected in drive 1 when power is turned on, the device will come up in CE Mode. If the device comes up in CE Mode, the wrap test was successful.  
**Note:** Device will not come up in CE Mode if wrap plug is installed in Drive 2. See “SCSI Wrap Test—Drive 2.”  
If a failure occurs, a message can be posted in the operator panel, or the operator panel can be blank. If any of these conditions exist:
  - a. Be sure that the wrap plug has no broken or bent pins which might have caused the wrap test to fail.
  - b. Go to the START section for further analysis.
6. Set the power switch to the Off position and remove the SCSI wrap tool.
7. Repeat the above steps with the SCSI wrap tool on the other SCSI connector in Drive 1.
8. Re-connect the SCSI cables and terminators removed earlier.
9. If you want to perform the SCSI wrap test on Drive 2, continue at: “SCSI Wrap Test—Drive 2,” otherwise return to the procedure that sent you here.

### SCSI Wrap Test—Drive 2

1. Set the power switch to the Off position.
2. Disconnect the SCSI cables and terminators from Drive 2 before attaching the wrap tool.
3. Install the SCSI wrap tool in either of the SCSI connectors on drive 2.  
**Note:** When you switch off power to the 3570, wait approximately 5 seconds before you switch on power again.
4. Set the power switch to the On position. The device will come up in operator mode after the power-on test is completed. To run the wrap test on Drive 2, do the following:
  - a. Switch to CE Mode. See “CE Mode Menus” on page PANEL-24.
  - b. Select Drive 2. See Figure 108 on page PANEL-13.
  - c. Select the Config/Install menu. See Figure 131 on page PANEL-30.



- d. Select the Wrap Tools option. See Figure 149 on page PANEL-41.
  - e. Observe the display for SCSI Wrap feedback. See Figure 152 on page PANEL-43
  - f. If the display shows SCSI: PRSNT, the wrap plug was detected and the test was successful. If the display shows SCSI: NOT PR, the wrap test was not successful.
5. If a failure occurs, a message will usually be posted in the operator panel, but at times the operator panel can be blank. If any of these conditions exist:
    - a. Be sure that the wrap plug has no broken or bent pins which might have caused the wrap test to fail.
    - b. Go to the START section for further analysis.
  6. Set the power switch to the Off position and remove the SCSI wrap tool.
  7. Repeat the above steps with the SCSI wrap tool on the other SCSI connector in Drive 2.
  8. Re-connect the SCSI cables and terminators removed earlier.
  9. If you want to perform the SCSI wrap test on Drive 1, continue at: "SCSI Wrap Test—Drive 1" on page PROC-84, otherwise return to the procedure that sent you here.

---

## SCSI Bus Problem Determination

Use the "Solid Errors" or the "Intermittent Errors" on page PROC-90 procedure.

### Solid Errors

Determine the number of drives on the SCSI bus.

#### Single Tape Drive on SCSI Bus

1. Check to see if drive power is on.
2. Check to see if the drive SCSI address is the same as the SCSI address being used by the host program.
3. If steps 1 and 2 are OK, run the SCSI wrap test. See "SCSI Port Wrap Test" on page PROC-84.  
**Note:** Refer to "SCSI ATTACHMENT" on page INST-46 to ensure that cables, interposers and terminators are installed correctly.
4. If the SCSI wrap test fails, replace the drive logic card. See "FID EA: Drive Logic Card" on page CARR-16.
5. If the SCSI Wrap test runs successfully, you may want to confirm a problem still exists by performing one of the following:
  - a. Check the SCSI attachment in an AIX Environment. See "Checking the SCSI Attachment in an AIX Environment" on page PROC-76.
  - b. Check the SCSI attachment in an AS/400 Environment. See "Checking the SCSI Attachment in an AS/400 Environment" on page PROC-73.
  - c. Check the SCSI attachment in an HP-UX Environment. See "Checking the SCSI Attachment in a HP-UX Environment" on page PROC-83.
  - d. Check the SCSI attachment in an Windows NT Environment. See "Checking the SCSI Attachment in a Windows NT Environment" on page PROC-70.
  - e. Check the SCSI attachment in a Sun Environment. See "Checking the SCSI Attachment in a Sun Environment" on page PROC-80.

This will help ensure that the drive is available and properly configured at the host. After checking the SCSI attachment, if the problem still exists, replace the SCSI terminator (first), then the SCSI cable and the interposer (if installed).

After replacing the SCSI cable and the interposer, if a problem still exists, the fault is with the host hardware or software. Go to the host service documentation to isolate the cause of the failure.

**Note:** Refer to "SCSI ATTACHMENT" on page INST-46 to ensure that cables, interposers and terminators are installed correctly.

#### Multiple Tape Drives on SCSI Bus

1. Determine if the problem exists with more than one drive. If the problem is with all of the devices on the SCSI bus, either the bus is hung or the SCSI cable from the host to the first device on the bus is defective.
2. Check to make sure the SCSI cable from the host to first device is connected.
3. Disconnect all except the first drive on the SCSI bus. Move the terminator to the first SCSI device.

4. If the error still occurs, run the SCSI wrap test on the first drive. See “SCSI Port Wrap Test” on page PROC-84.
5. If the SCSI Wrap test fails, replace the drive logic card in that drive. (See “FID EA: Drive Logic Card” on page CARR-16.)
6. If the SCSI Wrap test runs successful on the first drive, you may want to confirm a problem still exists by performing one of the following:
  - a. Check the SCSI attachment in an AIX Environment. See “Checking the SCSI Attachment in an AIX Environment” on page PROC-76.
  - b. Check the SCSI attachment in an AS/400 Environment. See “Checking the SCSI Attachment in an AS/400 Environment” on page PROC-73.
  - c. Check the SCSI attachment in an HP-UX Environment. See “Checking the SCSI Attachment in a HP-UX Environment” on page PROC-83.
  - d. Check the SCSI attachment in an Windows NT Environment. See “Checking the SCSI Attachment in a Windows NT Environment” on page PROC-70
  - e. Check the SCSI attachment in a Sun Environment. See “Checking the SCSI Attachment in a Sun Environment” on page PROC-80.

This will help ensure that the drive is available and properly configured at the host. After checking the SCSI attachment, if the problem still exists, replace the SCSI terminator (first), then the SCSI cable and the interposer (if installed).

After replacing the SCSI terminator or SCSI cable and the interposer, if a problem still exists, the fault is with the host hardware or software. Go to the host service documentation to isolate the cause of the failure.

**Note:** Refer to “SCSI ATTACHMENT” on page INST-46 to ensure that cables, interposers and terminators are installed correctly.

7. If the error does not occur, connect one drive at a time back on the bus until the error reoccurs.

**Note:** Ensure the SCSI terminator is always on the last drive on the bus.

8. When the error reoccurs, run the SCSI Wrap test on that drive. See “SCSI Port Wrap Test” on page PROC-84. If the test fails, replace the drive logic card. (See “FID EA: Drive Logic Card” on page CARR-16.) **If the test does not fail, you may want to confirm a problem still exists by performing one of the following:**
  - a. Check the SCSI attachment in an AIX Environment. See “Checking the SCSI Attachment in an AIX Environment” on page PROC-76.
  - b. Check the SCSI attachment in an AS/400 Environment. See “Checking the SCSI Attachment in an AS/400 Environment” on page PROC-73.
  - c. Check the SCSI attachment in an HP-UX Environment. See “Checking the SCSI Attachment in a HP-UX Environment” on page PROC-83.
  - d. Check the SCSI attachment in an Windows NT Environment. See “Checking the SCSI Attachment in a Windows NT Environment” on page PROC-70.
  - e. Check the SCSI attachment in a Sun Environment. See “Checking the SCSI Attachment in a Sun Environment” on page PROC-80.

This will help ensure that the drive is available and properly configured at the host. After checking the SCSI attachment, if problem still exists, replace the SCSI terminator (first), then the SCSI cable to the drive and interposer (if installed).

9. If the problem is with two or more of the drives, locate the first drive on the bus that has the error and replace the SCSI cable connecting that drive and the interposer (if installed).

10. If only one drive on the bus has the failure, run the SCSI wrap test on that drive. See "SCSI Port Wrap Test" on page PROC-84.
11. If the SCSI Wrap test fails, replace the drive logic card in that drive. (See "FID EA: Drive Logic Card" on page CARR-16.)

12. If the SCSI Wrap test is successful, you may want to confirm a problem still exists by performing one of the following:

**Note:** Refer to "SCSI ATTACHMENT" on page INST-46 to ensure that cables, interposers and terminators are installed correctly.

- a. Check the SCSI attachment in an AIX Environment. See "Checking the SCSI Attachment in an AIX Environment" on page PROC-76.
- b. Check the SCSI attachment in an AS/400 Environment. See "Checking the SCSI Attachment in an AS/400 Environment" on page PROC-73.
- c. Check the SCSI attachment in an HP-UX Environment. See "Checking the SCSI Attachment in a HP-UX Environment" on page PROC-83.
- d. Check the SCSI attachment in an Windows NT Environment. See "Checking the SCSI Attachment in a Windows NT Environment" on page PROC-70.
- e. Check the SCSI attachment in a Sun Environment. See "Checking the SCSI Attachment in a Sun Environment" on page PROC-80.

This will help ensure that the drive is available and properly configured at the host. After checking the SCSI attachment, if problem still exists, replace the SCSI terminator (first), then the SCSI cable to that drive and interposer (if installed).

**Note:** Refer to "SCSI ATTACHMENT" on page INST-46 to ensure that cables, interposers and terminators are installed correctly.

13. Go to "End of Call" on page PROC-15.

---

## RS-422 Port Wrap Test

Use **only** P/N 39F3884 for the wrap test; using the wrong wrap tool may cause the 3570 to not run the wrap test.

**Note:** The RS-422 interposer and wrap plug are not shipped with the 3570 but are available through the service branch.

1. Set the power switch to the Off position.

**Note:** When you switch off power to the 3570, wait approximately 5 seconds before you switch on power again.

2. Plug the 9-pin to 25-pin interposer P/N 05H3895 in the RS-422 port in the back of the drive. Plug the wrap plug P/N 39F3884 in the interposer.
3. Set the power switch to the On position. The wrap test runs automatically. When the drive detects that the wrap tool is installed in the port, the drive enters CE mode rather than operator mode during the power-on sequence.

This power-on test takes approximately 2.5 minutes to complete.

If a failure occurs, a message can be posted in the library operator panel display, or the library operator panel display can be blank. If any of these conditions exist, go to the START section for further analysis.

4. Set the power switch to the Off position and remove the wrap tool.
5. Return to the procedure that sent you here.



## Intermittent Errors

This procedure defines using a *trace tool*. The trace tool is used under direct assistance from your next level of support.

1. Get the layout of failing SCSI bus. The maximum SCSI bus length for a differential SCSI bus is 25 M (82.02 ft) minus 0.2 M (0.66 ft) per connection. Figure 280 shows an example of how to calculate the bus length. Figure 281 shows the cable part numbers for each length.

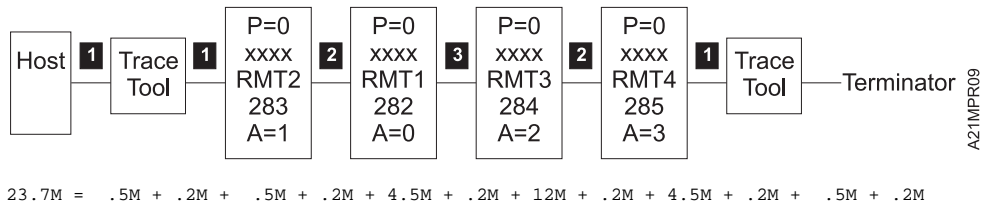


Figure 280. SCSI Bus Cable Lengths

Figure 281. Part Numbers for the 3570 SCSI Bus Cables and Terminators

Key	Meters	Feet	P/N	Usual Connection
1	0.5	2	49G6456	Devices in same rack
2	4.5	15	49G6457	Side by side
3	12.0	39	49G6458	Device connection to the host
4	18.0	59	49G6459	Device connection to the host
5	N/A	N/A	05H3834	Interposer
6	N/A	N/A	61G8323	Interposer
7	N/A	N/A	50G0460	Interposer
8	N/A	N/A	61G8324	Terminator

2. Obtain the errors that the device reported to the host. For example, if the device is attached to a RS/6000, run **tapeutil**. Select option 9, **Error Log Analysis**. Gather all possible error information.

**Note:** If you run a SCSI bus trace tool and you have more than one drive running, the non-failing drives may overlay the error.

### If Single Drive on SCSI Bus

1. Get a 3570 microcode dump and send it to your next level of support for analysis if the next step fails to fix the fault.
2. Replace or swap the SCSI bus cable and the terminator.
3. Start the trace of the next failure. For example, if you are using the AIX Tape Device Driver, type **atrc** to start the trace.
4. Connect the SCSI bus trace tool if a failure occurs. On the next failure, get a 3570 microcode dump and a SCSI bus trace. Send the dump and trace to your next level of support for analysis.

## If Multiple Drives on SCSI Bus

### If all drives fail:

1. Get a 3570 microcode dump and send it to your next level of support for analysis if next step fails.
2. Replace or swap the SCSI bus cable between the host and the first device and terminator.
3. Start the trace of the next failure. For example, if you are using the AIX Tape Device Driver, type **atrc** to start the trace.
4. Attach the SCSI bus trace tool if a failure occurs. On the next failure, get a 3570 microcode dump and a SCSI bus trace. Send the dump and the trace to your next level of support for analysis.

### If end drives fail:

1. Get a 3570 microcode dump and send it to your next level of support for analysis if next step fails.
2. Replace or swap the SCSI bus cable and the terminator between the last drive that works and the first drive that fails.
3. Start the trace of the next failure. For example, if you are using the AIX Tape Device Driver, type **atrc** to start the trace.
4. Connect the SCSI bus trace tool if a failure occurs. On the next failure, get a 3570 microcode dump and a SCSI bus trace. Send the dump and the trace to your next level of support for analysis.

### If only one drive (not end drive) fails:

1. Get a 3570 microcode dump and send it to your next level of support for analysis.
2. Start the trace of the next failure. For example, if you are using the AIX Tape Device Driver, type **atrc** to start the trace.
3. Trace only the failing drive or run only the failing drive.
4. Connect the SCSI bus trace tool if a failure occurs.
5. On the next failure, get a 3570 microcode dump and a SCSI bus trace. Send the dump and trace to your next level of support for analysis.



---

## FID E5—Microcode Problem

**Note:** For drive only models, get the support data from the host.

If FID E5 is currently displayed on the drive, go to step 1. If FID E5 is not currently displayed on the drive, go to step 2.

1. If FID E5 is **currently displayed** on the drive:
  - a. From FID display, write down the support data (12 characters).
  - b. Call your next of support with the FID and support data to determine if this problem is a new or known microcode problem.
  - c. For *known* microcode problems, ask your next level of support to see if a fix exists on latest EC Level. If a fix exists, update the device to latest EC level.

If a fix is not yet available, tell the customer that engineering is aware of problem and is working on a fix. Install the fix when available. For known microcode problems, use TAC M01.

d.

---

### New Microcode Problem

---

- 1) For *new* microcode problems, you must provide a microcode dump, the reported FID, and FID support data to your next level of support.
- 2) For certain failures, the drive automatically collects dump information. If the dump icon **!** is **displayed** when FID E5 is displayed, retrieve the dump via SCSI or cartridge and provide it to your next level of support.

**Note:** Retrieve dumps for both drive 1 and drive 2 in Models B02, B12 and B22.

See “Microcode Dump Procedures” on page PROC-93. See the START section entry point for microcode dump procedures. For new microcode problems, use TAC M02.

- 3) If the dump icon is **not displayed** when FID E5 is displayed, a dump must be forced:
  - a) Check with the customer to determine if they have collected a dump via SCSI for this problem (could be reason why no dump icon is displayed).
  - b) If the customer has the dump data, provide it to your next level of support.
  - c) If the customer does not have dump data or is not sure, go to CE Main Dump menu, and select **Force Dump**. A dump is available when the dump icon is displayed.
  - d) Retrieve the dump via SCSI or cartridge and provide it to your next level of support. See “Microcode Dump Procedures” on page PROC-93. See the START section entry point for microcode dump procedures. For new microcode problems, use TAC M02.

---

### End of New Microcode Problem

---

2. If FID E5 is **not currently displayed** on the drive:
  - a. Look at the FID log for most recent FID E5 entry. From the FID log, write down the support data (12 characters). Call your next level of support with the FID and support data to determine if this problem is a new or known microcode problem.
  - b. For *known* microcode problems, ask your next level of support to see if a fix exists on latest EC Level. If one exists, update customer to latest EC level.



If a fix is not available, tell the customer that engineering is aware of problem and working on fix. Install the fix when available. For known microcode problems, use TAC M01.

- c. For *new* microcode problems, a dump is needed. Check with customer to determine if they had collected a dump via SCSI for this problem when the FID and the dump icon was displayed. See “Microcode Dump Procedures.”

If the customer has the dump information, provide the dump, the FID, and the FID support data to your next level of support.

If no dump exists, go to step 3. For new microcode problems, use TAC M02.

3. Determine if the customer can readily recreate the FID E5 message.

If the customer **can** readily perform operations and/or run job that caused the E5 message, wait until it occurs and follow the procedure starting at step 1 on page PROC-92.

If the customer **cannot** readily recreate the message or it is an inconvenient time, the following options exist to acquire the dump for the next level of support:

- a. Allow the problem to reoccur and customer take the initiative.
- b. The customer can leave the drive with FID E5 message displayed and then call for service.
- c. If the dump icon is also displayed, the customer can retrieve the dump via SCSI (if host device driver software supports the dump function). See “Microcode Dump Procedures.”
- d. If the dump icon is not displayed, the customer can force an error dump (Op Services menu), which provides a FID FF and the dump icon. The FID FF indication means that a dump was forced (information message). The icon is for the FID E5, so now the customer can retrieve a dump via SCSI (if the host device driver software supports the dump function). See “Microcode Dump Procedures.”
- e. If the customer does not take the initiative, you can set a microcode trap. From the 12-character support data, do the following:
  - 1) Use the first four characters (if not starting with ‘A’ such as Axxx). Use the second set of four characters if first four characters are Axxx.
  - 2) Take the four characters (FSC) and select **UCODE TRAP** under the CE SERVICE UTILITIES Menu. Use the **ADD FSC TRAP** function. Refer to “Set Error Match Trap (To Get a Dump)” on page PROC-53. With this trap set, a dump will automatically be taken when this FSC is encountered, and the dump icon is displayed.
  - 3) The customer can retrieve the dump via SCSI for you or call you when the dump icon appears. See “Microcode Dump Procedures.”

4. Return to the procedure that sent you here or go to “End of Call” on page PROC-15.

## Microcode Dump Procedures

To get a microcode dump via the host through the SCSI interface or via a cartridge, see one of the following:

- “Offloading Dumps from 3570 to RS/6000 by Using TAPEUTIL” on page PROC-61
- “Offloading Dumps from 3570 Attached to AS/400” on page PROC-58
- “Offloading Dumps from 3570 to a Sun System by Using TAPEUTIL” on page PROC-64
- “Offloading Dumps from 3570 to Tape Cartridge (Library Models)” on page PROC-56
- “Offloading Dumps from 3570 to a HP—UX System by Using TAPEUTIL” on page PROC-66
- “Offloading Dumps from 3570 to Windows NT System Using NTUTIL” on page PROC-69

---

## FID E6 or E7—Isolate Fault between Microcode and Hardware

**Note:** For drive only models, get the support data from the host.

FID E6 can be displayed with several lines of support data (abnormal condition). If FID E6 or FID E7 is displayed use “FID E6, E7—Normal FID Display Procedure.”

### FID E6, E7—Normal FID Display Procedure

**Note:** For drive only models, get the support data from the host.

Use either the “FID Currently Displayed on Drive” or the “FID Not Currently Displayed on Drive” on page PROC-95 procedure.

#### FID Currently Displayed on Drive

1. From FID display, write down the support data (12 characters). Call your next level of support with the FID and support data to determine if this problem is a new or a known microcode problem.

Known Microcode Problem

2. For known microcode problems, see if a fix exists on latest EC Level. If a fix exists, update the drive to the latest EC level. For known microcode problems, use TAC M01.
3. If a fix does not exist, tell the customer that engineering is aware of problem and is working on a fix. Install the fix when it is available.

End of Known Microcode Problem

4. At this point it could be a new microcode problem or a hardware problem. Because it could be a potential new microcode problem, get a microcode dump.

New Microcode Problem

#### New Microcode Problem

##### ***Dump Icon (!) Also Displayed***

For certain failures, the drive automatically collects dump information. Retrieve the dump via SCSI or cartridge (save for now).

##### ***Dump Icon Not Displayed***

For certain failures, the drive automatically collects dump information, other failures require you to force a microcode dump.

1. Check with the customer to determine if they collected a dump via SCSI for this problem (could be why no dump icon is displayed).
2. If the customer has the dump data, save it for now.
3. If the customer does not have the dump data, or is not sure, go to the CE Main Dump menu, and select the **Force Dump** option. Dump exists when dump icon is displayed.
4. Retrieve a dump via SCSI or cartridge; save it for now.
5. Power off the device and then power on the device.

6. Run Verify Fix diagnostics.
  - a. If you get a new or a different FID, go to the START section with that information.
  - b. If you get the same FID (E6 or E7), a hardware problem exists. Do not save the microcode dump. Perform actions for next FRU in the FID List.
  - c. If an error does not occur, the fault could be a new microcode problem or an intermittent electronics problem. Call your next level of support and provide them with dump and the 12-character support data. For new microcode problems, use TAC M02. For electronic problems, use TAC T21.
7. Go to "End of Call" on page PROC-15.

End of New Microcode Problem

## FID Not Currently Displayed on Drive

1. Look at the FID Log for most recent FID E6 or FID E7 entry.
2. From the FID Log, record the support data (12 characters). Call your next level of support with the FID and support data to determine if this problem is a known microcode problem.
3. For new or known microcode problems:
  - a. From support, see if fix exists on latest EC Level. If a fix exists, update the drive to latest EC level.
  - b. If a fix does not exist, tell customer that engineering is aware of problem and working on a fix. Install the fix when it is available. For known microcode problems, use TAC M01.
4. At this point it could be a new microcode problem or a hardware problem.
  - a. Power off the device and then power on the device.
  - b. Run **Verify Fix** from the CE Options menu.
  - c. If you get a new or a different FID, go to the START section with that information.
  - d. If you get the same FID (E6 or E7), a hardware problem exists. Perform the actions for next FRU in FID List.
5. If an error does not occur, the fault could be a new microcode problem or an intermittent electronics problem. You need to get a dump.
  - a. A dump may already exist. Check with the customer to determine if they had collected a dump via SCSI for this problem when the FID and the dump icon were displayed.  
  
If the customer has the dump data, provide the dump, the FID, and the FID support data to your next level of support.
  - b. If no dump exists, go to step 6.
6. Determine if the customer can readily recreate the FID message.
7. If the customer can readily perform operations and/or run the job that caused the message, wait until it occurs and follow the procedure for the FID currently displayed.
8. If the customer cannot readily recreate the message, or if this is an inconvenient time, the following options exist to acquire the dump for your next level of support.  
  
Allow the problem to reoccur and have the customer take the initiative (go to step 8a) or you can take the initiative (go to step 9 on page PROC-96).
  - a. The customer can leave the drive with FID message displayed and then call for service.
  - b. If the dump icon is also displayed, the customer can retrieve a dump via SCSI (if host device driver software supports).

- c. If the dump icon is not displayed, the customer can select Force Error Dump (operator Services menu), which will provide a FID FF and the dump icon. FID FF indicates that a dump was forced (information message). The icon is for the FID E6, so now the customer can retrieve a dump via SCSI (if the host device driver software supports dumps)
9. You can take the initiative and Set a Microcode Trap as follows:
  - a. From the 12-character support data, use the first four characters (if it does not start with 'A' such as Axxx). Use the second set of four characters if the first four are Axxx.
  - b. Take the four characters (FSC) and use the Microcode Trap facility under CE Utilities menu. Use the Add FSC Trap function. With this trap set, a dump will automatically be taken when this FSC is encountered, and the dump icon is displayed. The customer can retrieve the dump via SCSI for you or can call for service when the dump icon appears.
10. Perform "End of Call" on page PROC-15 or return to the procedure that sent you here.

## FID E6—Abnormal Display Condition

FID1 E6 is followed by four lines of support data. As the following example shows, each line contains eight characters:

```
FID1 E6
FSC AAAA BBBB
FSC CCCC DDDD
FSC EEEE FFFF
FSC F 2 EEEE
```

When the above is displayed (EEEE is repeated), the operator panel is frozen (you cannot select another menu, and the push buttons do not respond). Therefore, you cannot use the panel or cannot get dumps from either the host or the panel.

1. Obtain as much information as possible regarding the job being run, any drive operations, and the failure scenario. Record the information displayed on the panel (including the four lines of support data). Save this information for now.
2. Switch off power, wait 5 seconds and then switch on power to run the power-on self-test (POST).
  - a. If you get a FID EA in small letters during the POST, replace the logic card.
  - b. If you get a different FID, use it and go to the START section.
  - c. If the POST is OK, select **Verify Fix** and **Test Drive**.
    - 1) If you get a FID, use it and go to the START section.
    - 2) If it runs OK, we are in recreate mode.
    - 3) If the customer can readily perform operations and/or run the job that caused this condition, wait until it occurs. Obtain as much information as possible regarding job being run, any drive operations, and failure scenario. Record all the information displayed on the panel.
    - 4) Call your next level of support.
    - 5) Use TAC M01 for known microcode problems and TAC M02 for new microcode problems.
    - 6) If the customer cannot readily recreate the message, or it is an inconvenient time, take the information previously saved and contact your next level of support.
    - 7) Use TAC M01 for known microcode problems and use TAC M02 for new microcode problems.
    - 8) Go to "End of Call" on page PROC-15.

---

## FID FE—Isolate Fault between Media and Hardware

A FID FE will be generated when the drive experiences an error and cannot determine if the error was caused by the tape cartridge or by a problem in the drive hardware. The FID FE **is not** displayed on the drive, but is logged in the sense information that is returned to the host system. If the customer receives errors when reading or writing to the drive and there is no FID displayed on the drive, a FID FE was probably returned in the sense information to the host. If needed, refer to the MSG section to determine how to obtain service information from the host system.

To determine the cause of the read or write errors, follow the steps below:

1. Ensure that the tape drive is not overdue for cleaning:
  - a. If a Model B00, clean if the CLEAN LED is lit.
  - b. If a Library Model tape drive, ensure that the AUTO CLEAN option is ON and that a cleaner cartridge is installed.
  - c. Always avoid excessive cleaning as this will damage the heads.
2. Determine which VOLSER #s, cartridges or hardware area are potential problems:
  - a. Ask the customer to note which cartridges (VOLSER #s) fail during the operation. (It is possible to have multiple bad cartridges.)
  - b. Examine the FID FE log using the "LOGS" option of the CE Menu on the operator panel. Collect FID information. See Figure 130 on page PANEL-27 and Figure 155 on page PANEL-45. The FE log will display entries for up to 10 of the most recent occurrences of the FE error. Each entry consists of information that pertain to the error:
    - 1) The first line provides an alternate FID number that you can use to isolate the problem.
    - 2) The second line displays the first and last FSC's and the microcode link.
    - 3) The third line provides a power-on date/time stamp which can be correlated with power-on hours in the "Show Statistics Menu", or a "Current Time Stamp" option (if present).
3. Determine if the cartridges are bad:
  - a. Examine cartridge for damage, for example, leader block not attached or cracked cartridge. If damaged, ask customer to repair or replace cartridge.

**Note:** a repaired cartridge may be used long enough to recover data on that cartridge. When the data has been recovered, the cartridge should be taken out of service by the customer and discarded.
  - b. If the cartridges look OK and you have access to another 3570 try the operation with the suspect cartridges in another 3570.
  - c. Have the customer replace any cartridges that have failed in more than one 3570.
4. If the cartridges are not bad, isolate the problem to a drive FRU:
  - a. Examine the log entries and using the alternate FID numbers provided, try to determine a common reason for the FE errors.
  - b. Use the error log analysis procedure at "Error Log Analysis Procedure" on page PROC-48 as an approach to problem isolation.
5. Correct the failure:
  - a. Before replacing any FRUs, check the head cable connections. Make sure that the head cables are not loose. After replacing FRUs, go to 5b.
  - b. Test the drive:

| 1) Run drive verify diagnostics. See “Verify Fix—Drive-Only Models” on page PROC-9 or “CE  
| Verify Fix on Library Models” on page PROC-13 for procedures. Use the CE scratch tape  
| when you are prompted to load a tape.

| If the test fails with the same FID as the one reported or logged, go to “FID Entry Point” on  
| page START-12 to fix the fault. Continue with the FRU list for this FID.

| If the test fails with a different FID from the one reported or logged, use the new FID and go to  
| “FID Entry Point” on page START-12 to fix the fault.

| c. If the customer still has a problem, replace FRUs only if appropriate using your analysis of error  
| log data. Contact support for assistance with testing tape drive head or testing the media.

6. Perform “End of Call” on page PROC-15 or return to the procedure that sent you here.



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## No Response from Operator/CE Panel and No Message

1. If hung/frozen panel was reported by customer but **does not currently exist** on drive, ask the customer if they can readily recreate the failure. If they cannot recreate the failure or it is an inconvenient time for the customer, have them call for service when the fault reoccurs. When the fault occurs, ask them to leave the drive in that condition and call for service.

If the host software supports microcode dumps, ask the customer to force a dump via SCSI and retrieve dump via SCSI because this type of fault prevents dumps via the panel.

When the problem is recreated, with or without a dump, contact your next level of support.

2. If hung/frozen panel **currently exists** on the drive, check to see if the dump icon ! is displayed.
  - a. If the dump icon is not displayed and the host software supports microcode dumps, ask the customer to force a SCSI dump and retrieve the dump via SCSI.
  - b. Get the dump and contact your next level of support.

**Note:** A dump may be forced by pressing the Mode push button 10 times in a row.

3. If the dump icon is displayed and the host software supports microcode dumps, ask the customer to retrieve the dump via SCSI.

Take a microcode dump and contact your next level of support.

4. If the host does not support SCSI retrieval of dump:

- a. Press Change Mode to try to get into service mode.
- b. If you cannot get into service mode, contact your next level of support.

**Note:** A dump may be forced by pressing the Mode push button 10 times in a row.

- c. If you can get into service mode, copy dump to cartridge and save it for now.

- 1) Power off the device and then power the device on.
- 2) Run the Verify Drive diagnostic.
- 3) If a failure occurs with a new FID, use the new FID and go to the START section.
- 4) If no error occurs, the problem can be a microcode problem or an intermittent hardware problem. Call your next level of support and provide them with the microcode dump.

5. Perform "End of Call" on page PROC-15 or return to the procedure that sent you here.



# Checks, Adjustments, Removals, and Replacements

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FID DC: AC Power Cord . . . . . CARR-52

This section contains the information necessary to find, check, adjust if necessary, and exchange the failing field replaceable unit (FRU).

The FID (FRU identifier) numbers are listed in hexadecimal ascending order in Figure 8 on page START-12. You may be directed to the **START** section, and then to this section, when a FID number is presented in one of the following ways:

By the LED indicators flashing a FID code through the front bezel of the Model B00 Drive.

On the operator panel display of library Models B01, B02, B11, B12, B21 and B22.

At the host console from the service information message (SIM) for any 3570 Tape Subsystem.

From the MAPs.



---

## Removal and Replacement Procedures—External Covers

**Note:** When you are removing a cover to access FRUs inside the machine, you may want to complete your testing prior to replacement of these covers, in case the FRU you replaced did not fix the problem.

### Library Chassis Covers

**Removal of Library Chassis Covers:** Figure 282 on page CARR-6 shows a picture of the Model B01 machine with its decorative covers installed on the library chassis.

Figure 283 on page CARR-7 shows an exploded view of the Model B01 machine with its decorative covers and internal components.

To remove the library chassis covers follow the steps below:

1. "Prepare the Tape Device for Service" on page PROC-6 and then return here.
2. For the stand-alone Models B01 and B02, open the magazine door and remove two screws from the front and two screws in the rear securing the library top decorative chassis cover, item 1. Slide the top cover clear to expose the top protective cover. Remove the top protective cover, item 2 by removing two screws in the rear, and two screws on the sides of the cover. Lift the rear of the cover and pull toward the rear of the device to clear the front tab from the library front decorative cover.
3. For the rack-mounted Models B11, B12, B21 and B22 there is no decorative chassis cover. Remove the top protective cover by removing two screws in the rear and two screws on the sides of the cover. Lift the rear of the cover and pull toward the rear of the device to clear the front tab from the library front decorative cover.

### Replacement of Library Chassis Covers

1. Perform the removal procedure in the reverse order, then return here.
2. Return to the Procedure that sent you here.

## Decorative Cover—Drive-Only Models

The decorative cover 2 of drive-only models must be removed for access to most FRUs in the drive. See Figure 284.

### Removing the Decorative Covers—Drive-Only Models

1. From the rear of the unit, remove and save the 3 screws, items 3 (two screws not shown), that hold the decorative cover 2 to the chassis.
2. From the front of the unit, depress the tabs 1 on both sides of the cover and carefully pull the drive front cover away from the chassis. Be sure to observe the detents in the chassis as you pull on this cover.
3. From the front of the unit, grip the cover at the sides and push backward to clear two holding hooks, then lift clear of the chassis.
4. If removal of the drive pack is required, go to “Drive Pack, Drive-Only Models” on page CARR-8.
5. Return to the procedure that sent you here.

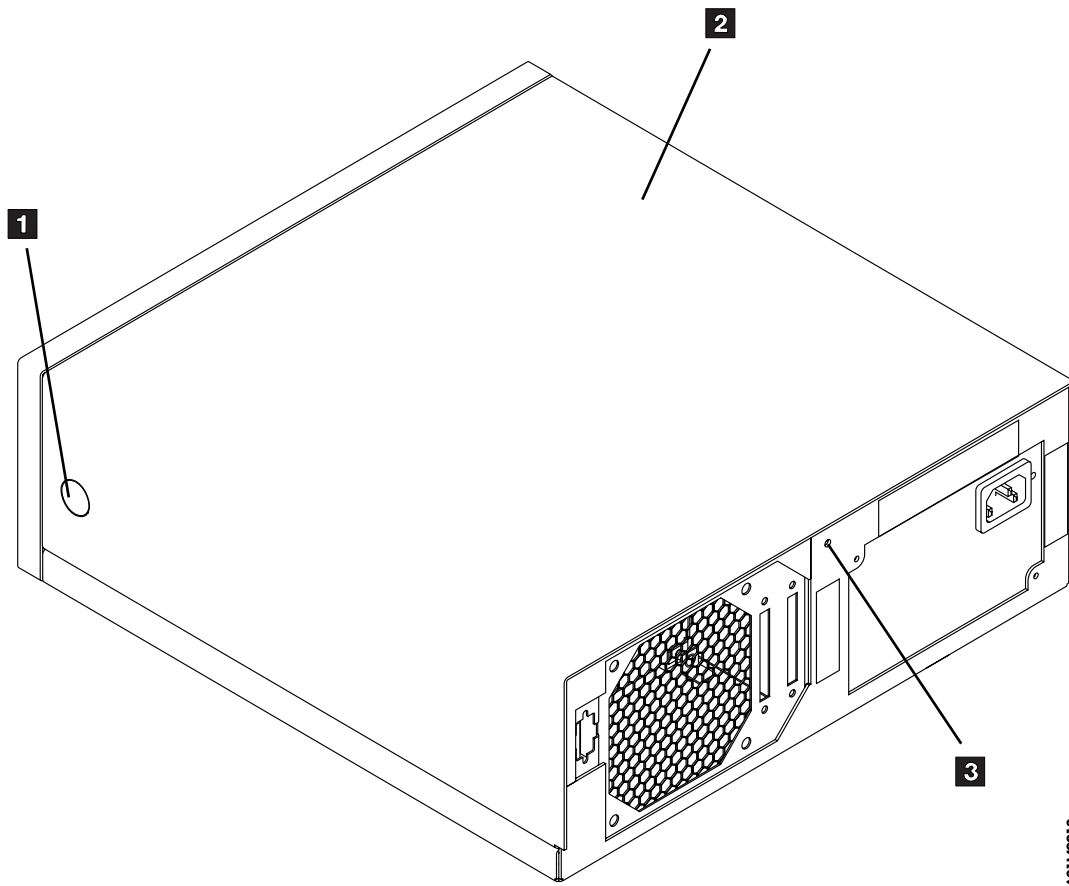


Figure 284. Decorative Cover for Model B00 Drive

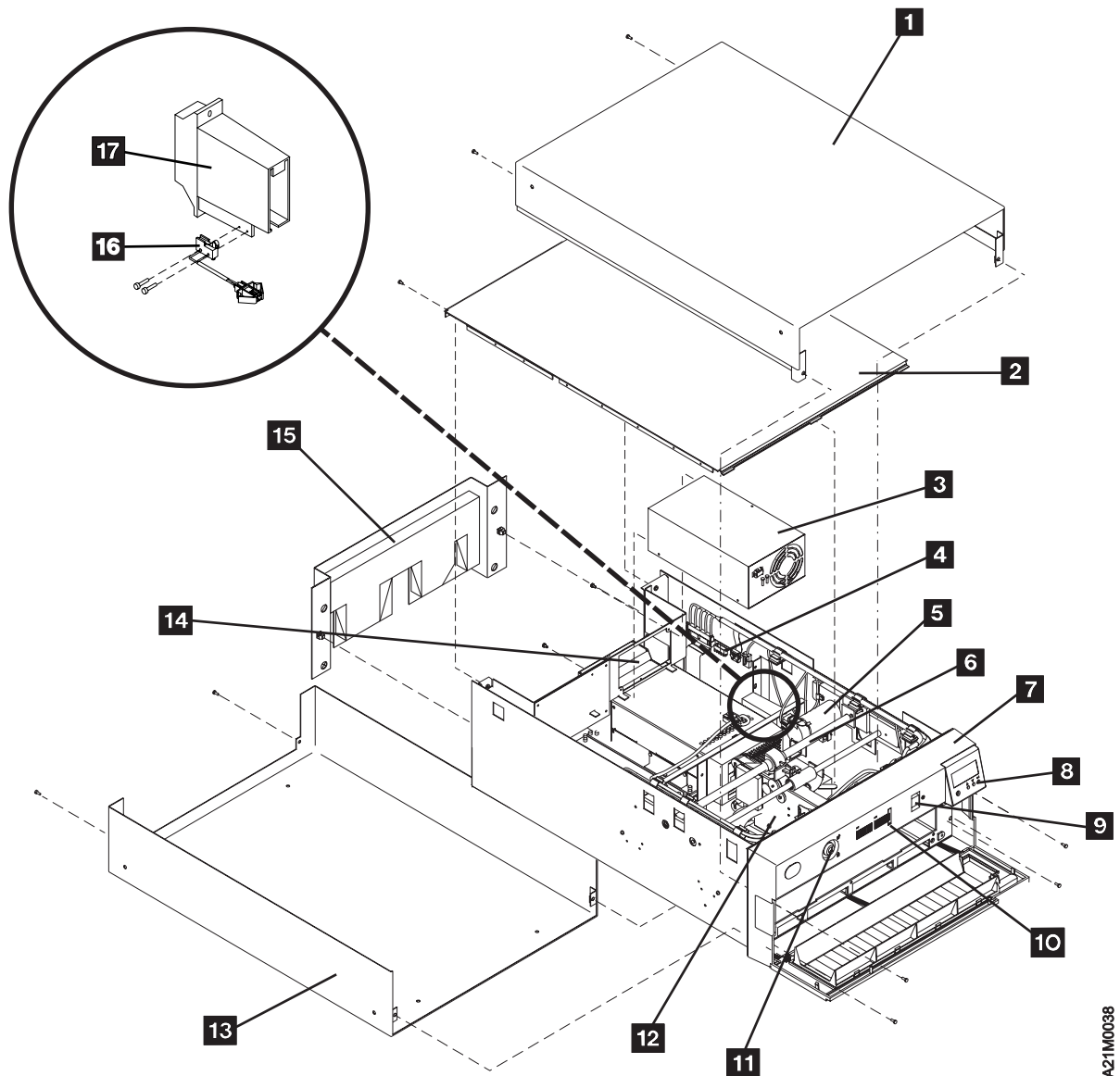


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Figure 282. Library Models B01 or B02—External Covers Not installed

### Replacing the Decorative Covers—Drive-Only Models

1. Place the decorative cover 2 on the chassis by fitting it to the rear of the chassis first and then moving it forward to the front.
2. Replace and tighten the 3 cover screws, item 3 (two screws not shown).
3. Reattach the drive front cover. Observe the detents in the front of the chassis as the front cover is engaged to the top cover with tabs 1 .



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Figure 283. Library Model B01—Exploded View

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## Removal and Replacement Procedures—Drive Pack

### Notes:

1. Be sure you are working on a B-Series drive. B-Series drives have a **blue** UNLOAD button. If your drive has a **green** UNLOAD button, refer to *Magstar MP 3570 Tape Subsystem Maintenance Information B-Series Models*. Microcode levels indicate machine type, I4=B-series, I5=C-series.
2. When you are removing the drive pack to access parts inside the drive, you may want to complete your testing prior to replacement of the drive pack, in case the FRU you replaced did not fix the problem. You can feed cartridges in a drive-only device, without having all the covers back on, for testing purposes, if you connect all the cables and place the drive on a flat surface. On library models, you can also cause the library and drive to operate together, even though the drive is not physically installed inside the library, if you follow the procedure outlined in “Short-cut Test Procedure—Library Devices” on page PROC-16.

## Drive Pack, Library Models

**Removal of Drive Pack from Chassis:** To remove the physical drive follow the steps below:

1. “Prepare the Tape Device for Service” on page PROC-6 and then return here.
2. Perform removal of the “Library Chassis Covers” on page CARR-4.
3. Remove the rear cover from the library. The cover is attached using snap-in plastic retainers that expand when pushed in, and compress when the internal plugs are pulled out.
4. Remove the 4 screws that hold the rear plate to the library frame and remove the plate.
5. Remove the following electrical connections from the drive:
  - a. The ac power cord to power supply
  - b. 4-wire power connection between the drive and power supply
  - c. 2-wire fan power connection between the drive and power supply
  - d. Ribbon cable CAC-P1 between the drive and library control card (library models only)

**Note:** To remove the cable connector from the drive and board connectors, depress the tension clips on either side of the cable connectors.
  - e. SCSI cable(s)
  - f. SCSI terminator if installed
  - g. The RS-422 cable connecting drive 1 to drive 2 (Models B02 and B12 only)
6. Refer to Figure 283 on page CARR-7 for a view of the drive pack within a typical library model environment.
7. Remove the two screws on either side of the drive pack 14 and remove the drive assembly from the library chassis.

## Replacement of Drive Pack into Library Chassis

1. Perform the removal procedure in the reverse order, then return here.
2. Return to the procedure that sent you here.

## Drive Pack, Drive-Only Models



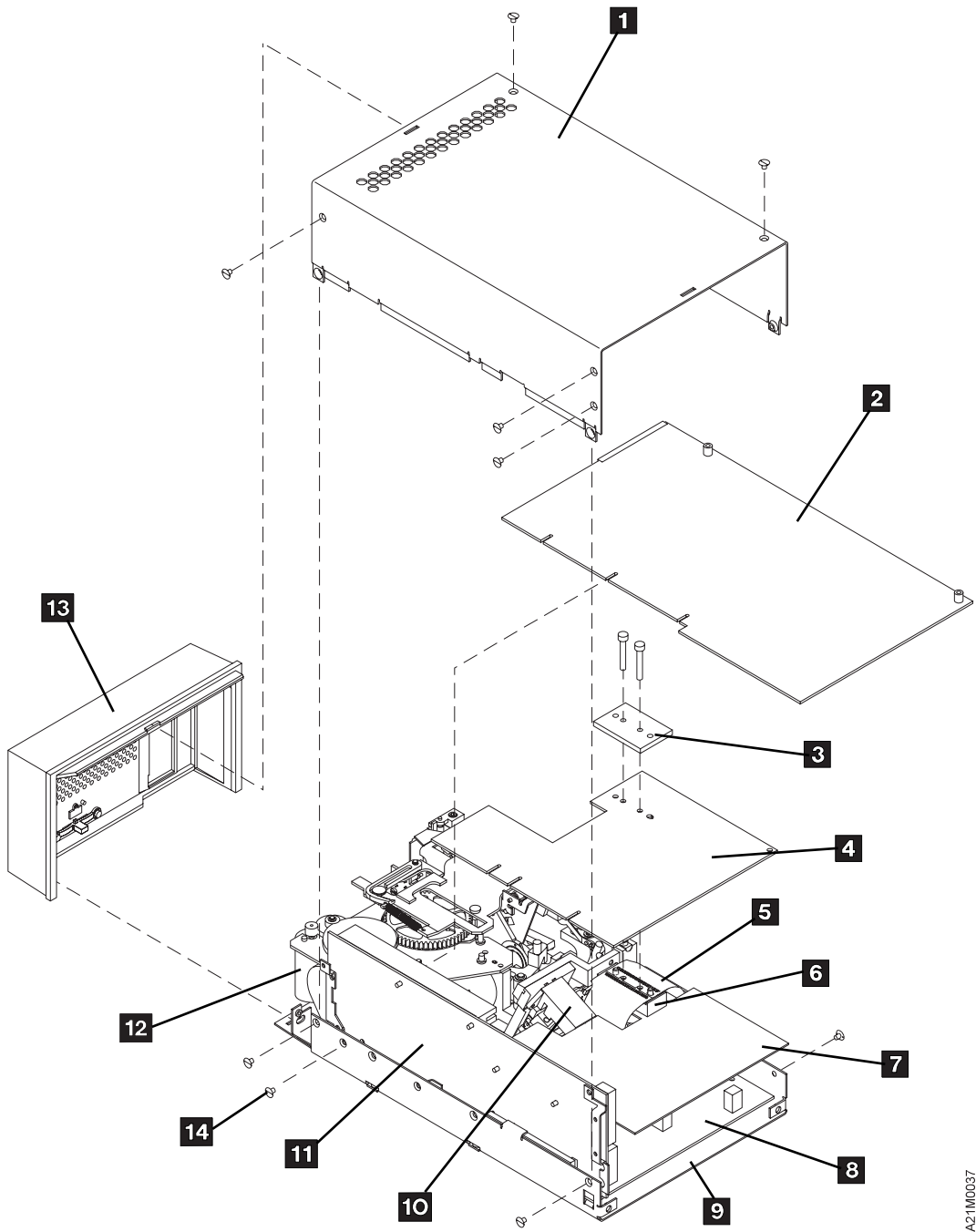
**Removal of Drive Pack from Chassis:** To remove the physical drive follow the steps below:

1. "Prepare the Tape Device for Service" on page PROC-6 and then return here.
2. Perform removal of the "Decorative Cover—Drive-Only Models" on page CARR-5.
3. Remove the following electrical connections from the drive:
  - a. The ac power cord to power supply
  - b. 4-wire power connection between the drive and power supply
  - c. 2-wire fan power connection between the drive and power supply
  - d. SCSI cable(s)
  - e. SCSI terminator if installed
4. Refer to Figure 285 on page CARR-10 for a view of the drive pack as it looks within all the models.
5. Remove the two screws on the right hand side as you face the front of the drive (not shown).
6. Remove the two screws on the left hand side as you face the front of the drive. These screws secure the left holding bracket to the base.
7. Lift and remove the drive assembly from the chassis.

### **Replacement of Drive Pack into Chassis**

1. Perform the removal procedure in the reverse order, then return here.
2. Return to the procedure that sent you here.





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Figure 285. Basic Drive—All Models

<i>Figure 286. Basic Drive Components</i>	
<b>Component</b>	<b>Key (Refer to Figure 285)</b>
Drive assembly top cover	1
Drive logic card	2
Spacer	3
Drive analog card	4
Head-actuator assembly thin—film cables	5
Rubber compression block	6
Shield	7
Drive servo card	8
Loader assembly mounting plate	9
Head-actuator assembly	1
Mother board	11
Loader assembly	12
Drive assembly front cover	13
screw	14



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## Removal and Replacement Procedure—Cooling Pack

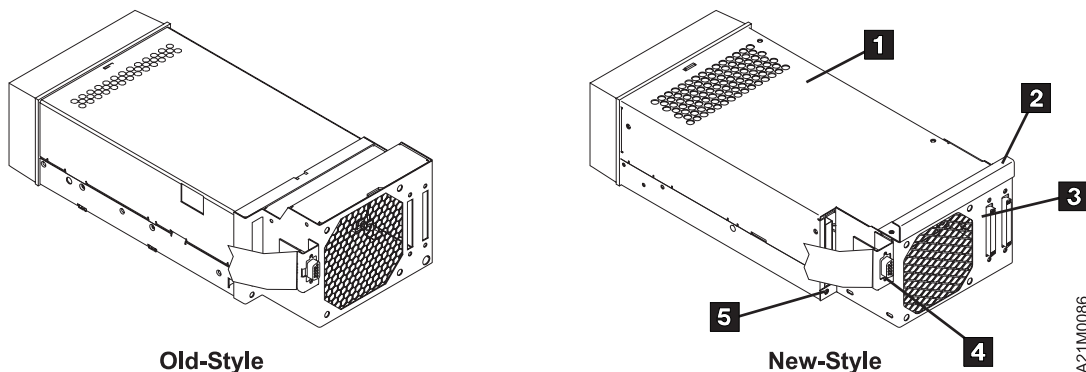
**Note:** When you are removing the cooling pack to access parts inside the drive, you may want to complete your testing prior to replacement of the cooling pack, in case the FRU you replaced did not fix the problem. You can run the drive for a short period of time without the cooling pack to verify, for testing purposes, that the FRU you just replaced, was the failing FRU. Long term running without the cooling pack may damage the machine or shorten component life.

### FID B2: Cooling Pack

**Removal of the Cooling Pack:** For location of the cooling pack in a drive-only model, see Figure 27 on page INTRO-16 item 6. For location of the cooling pack in a library model, see Figure 283 on page CARR-7 item 14.

**Note:** There are two types of cooling packs that may be installed. See Figure 287. The removal and replace procedure is the same for both.

1. “Prepare the Tape Device for Service” on page PROC-6 and then return here.
2. Perform removal of the “Library Chassis Covers” on page CARR-4 for library machines, **or** “Decorative Cover—Drive-Only Models” on page CARR-5 for drive-only machines.
3. Perform removal of the “Drive Pack, Library Models” on page CARR-8 for library machines, **or** “Drive Pack, Drive-Only Models” on page CARR-8 for drive-only machines.
4. Perform removal of the “FID B2: Cooling Pack” as follows:
  - a. Remove one screw in the rear of the drive pack (not shown) that holds the the cooling pack to the drive assembly. The other side of the cooling pack is held in place by a holding stud.
  - b. Squeeze the holding springs and disconnect the small flat cable (RS-422) from the mother board.
  - c. Carefully backout the cooling pack to expose the large flat cable (internal SCSI cable) and disconnect the cable.
  - d. Remove the cooling pack from the drive pack.



| Figure 287. Old and New Style Cooling Packs

### Replacement of the Cooling Pack

**Note:** Be careful to route the SCSI cable so that it does not contact the cooling fan blades.

1. Perform the removal procedure in the reverse order.
2. Perform “End of Call” on page PROC-15.
3. The cooling pack (FID B2) is not a FRU. The drive cooling fan (FID BE) and the internal SCSI

connector (FID CB) are FRUs. If one of these are replaced, use the FID and TAC code for those parts.

4. Return to the procedure that sent you here.

## FID BE: Drive Cooling Fan

### Removal of Drive Cooling Fan

1. Prepare the drive for service.
2. Perform “Drive Pack, Library Models” on page CARR-8 for library models, or “Drive Pack, Drive-Only Models” on page CARR-8 for drive-only models.
3. Perform “FID B2: Cooling Pack” on page CARR-12 then return here.
4. Remove the four plastic inserts and insert clamps from the back of the cooling pack and remove the drive cooling fan.

### Replacement of Drive Cooling Fan

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **A03** for the area of failure.
4. Return to the procedure that sent you here.



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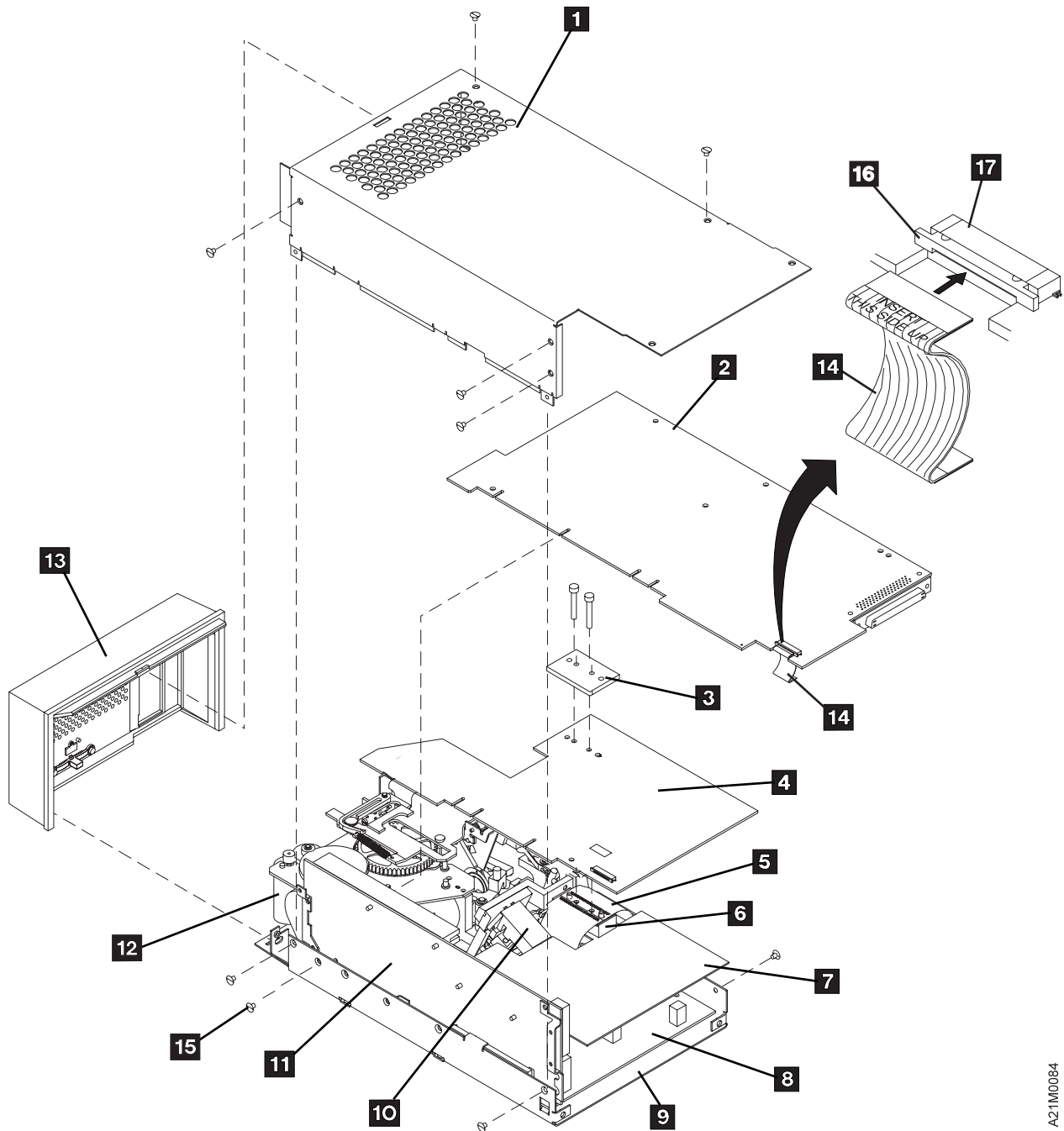
## Removal and Replacement Procedures—Base Drive Components

Before performing any recommended removal or replacement procedures, you should complete the following procedures that apply to the model of 3570 you are here to repair:

**Note:** The removal and replacement Time Estimate in the last column of the table may be used, along with the FID removal and replacement durations given in the START section to help you determine how much time you will need to repair the device. Diagnose and test time are not included in the estimates.

Figure 288. Prerequisite Procedures

3570 Model	Service Procedure Description	Procedure Location	Time Estimate
B00	<ol style="list-style-type: none"> <li>1. Prepare the tape drive for service</li> <li>2. Decorative Cover—Drive-Only Models</li> <li>3. Drive Pack, Drive-Only Models</li> <li>4. Drive Assembly Front Cover</li> <li>5. Drive Assembly Top Cover</li> <li>6. FID B2: Cooling Pack</li> </ol>	<ol style="list-style-type: none"> <li>1. "Prepare the Tape Device for Service" on page PROC-6</li> <li>2. "Decorative Cover—Drive-Only Models" on page CARR-5</li> <li>3. "Drive Pack, Drive-Only Models" on page CARR-8</li> <li>4. "Drive Assembly Front Cover" on page CARR-15</li> <li>5. "Drive Assembly Top Cover" on page CARR-16</li> <li>6. "FID B2: Cooling Pack" on page CARR-12</li> </ol>	<ol style="list-style-type: none"> <li>1. (0.1)</li> <li>2. (0.1)</li> <li>3. (0.2)</li> <li>4. (0.1)</li> <li>5. (0.1)</li> <li>6. (0.1)</li> </ol>
B01, B02, B11, and B12	<ol style="list-style-type: none"> <li>1. Prepare the tape drive for service</li> <li>2. Library Chassis Covers</li> <li>3. Drive Pack, Library Models</li> <li>4. Drive Assembly Front Cover</li> <li>5. Drive Assembly Top Cover</li> <li>6. FID B2: Cooling Pack</li> </ol>	<ol style="list-style-type: none"> <li>1. "Prepare the Tape Device for Service" on page PROC-6</li> <li>2. "Library Chassis Covers" on page CARR-4</li> <li>3. "Drive Pack, Library Models" on page CARR-8</li> <li>4. "Drive Assembly Front Cover" on page CARR-15</li> <li>5. "Drive Assembly Top Cover" on page CARR-16</li> <li>6. "FID B2: Cooling Pack" on page CARR-12</li> </ol>	<ol style="list-style-type: none"> <li>1. (0.1)</li> <li>2. (0.2)</li> <li>3. (0.2)</li> <li>4. (0.1)</li> <li>5. (0.1)</li> <li>6. (0.1)</li> </ol>
B11 and B12	<ol style="list-style-type: none"> <li>1. Prepare the tape drive for service</li> <li>2. Library Chassis Cover</li> <li>3. Drive Pack, Library Models</li> <li>4. FID B2: Cooling Pack</li> </ol>	<ol style="list-style-type: none"> <li>1. "Prepare the Tape Device for Service" on page PROC-6</li> <li>2. "Library Chassis Covers" on page CARR-4</li> <li>3. "Drive Pack, Library Models" on page CARR-8</li> <li>4. "FID B2: Cooling Pack" on page CARR-12</li> </ol>	<ol style="list-style-type: none"> <li>1. (0.1)</li> <li>2. (0.2)</li> <li>3. (0.2)</li> <li>4. (0.2)</li> </ol>



CARR

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Figure 289. Base Drive FRU Breakout

The following base drive removal and replacement procedures apply to all 3570 models, and are listed in the most logical order of a typical repair action:

## Removal and Replacement Procedure—Drive Pack Covers

### Drive Assembly Front Cover

**Removal of Drive Assembly Front Cover:** See Figure 289 for an exploded view of the drive pack. To remove the drive assembly front cover, item 13, follow the steps below if not done before:

1. "Prepare the Tape Device for Service" on page PROC-6 and return here.

2. Perform removal of the “Library Chassis Covers” on page CARR-4 for library machines, or “Decorative Cover—Drive-Only Models” on page CARR-5 for drive-only machines.
3. Perform removal of the “Drive Pack, Library Models” on page CARR-8 for library machines, or “Drive Pack, Drive-Only Models” on page CARR-8 for drive-only machines.
4. Press down on the top center of the drive assembly front cover and tilt it forward and off the drive assembly.

**Note:** Be sure to install the cover back on the drive pack before the call is completed. The cover is required to get proper air flow to the drive logic card.

### ***Replacement of Drive Assembly Front Cover***

1. Perform the removal procedure in the reverse order.

#### **ATTENTION**

Be sure to insert the bottom of the bezel first before attempting to tilt the top of the bezel into its proper latching position. Damage may occur to components on the drive logic card that are in close proximity to the top of the bezel, if the top of the bezel is inserted first.

2. Return to the procedure that sent you here.

## **Drive Assembly Top Cover**

**Removal of Drive Assembly Top Cover:** See Figure 289 on page CARR-15 for an exploded view of the drive pack. To remove the drive assembly top cover 1 follow the steps below if not done before:

1. “Prepare the Tape Device for Service” on page PROC-6 and return here.
2. Perform removal of the “Library Chassis Covers” on page CARR-4 for library machines, or “Decorative Cover—Drive-Only Models” on page CARR-5 for drive-only machines.
3. Perform removal of the “Drive Pack, Library Models” on page CARR-8 for library machines, or “Drive Pack, Drive-Only Models” on page CARR-8 for drive-only machines.
4. Perform removal of the Drive Assembly Front Cover.
5. Remove the top cover extension.
6. Remove 2 top cover screws, 5 right side screws, and 2 left side screws that attach the top cover 1 to the drive pack. (Use a number 0 or 1 phillips screwdriver.)
7. Carefully lift cover clear of the drive unit

### ***Replacement of Drive Assembly Top Cover***

1. Perform the replacement procedure in the reverse order.
2. Return to the procedure that sent you here.


## **FID EA: Drive Logic Card**

**Removal of Drive Logic Card:** To remove the drive logic card, item 2 in Figure 289 on page CARR-15, follow the steps below if not done before:

**Note:** If you are removing the drive logic card only to gain access to another FRU blocked by the drive logic card, continue with step 3 on page CARR-17. If you plan to **replace** the drive logic card with a **new** part, you should **attempt** to recover the microcode EC and link level of the drive logic card with the following procedures.



1. For library models, do the following:
  - a. Attempt to display the EC level and link level:
    - 1) Press the Mode push button if the operator Options menu is not displayed.
    - 2) Select the drive number that you are working on.
    - 3) Select **Services** from the Options menu and press Enter.
    - 4) Select **Microcode Level** from the Services menu and press Enter.
  - b. If the microcode EC level was displayed in the previous step, write the EC level, link level and date in “Microcode EC Level History Log” on page PROC-47; and then return here.
  - c. If you don't have access to this level of FMR tape, but your machine failure **will** allow you to create a FMR tape, do so following the procedure on “Making FMR Tape from Scratch Tape—Library Models” on page PROC-39 or “Making FMR Tape from Scratch Tape—Drive-Only Models” on page PROC-39, then go to 3.
  - d. If the microcode EC level cannot be displayed, go to step 3.
2. For drive-only machines, there is no current way to read the microcode EC level unless that can be gathered by the host system. Continue with step 3.
3. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.

**Note: Attention:**  The logic cards are ESD sensitive. Special care must be used when handling ESD parts. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4.

4. See Figure 289 on page CARR-15. Disconnect the flat cable, item 14, from the drive logic card. Pull the cable retainer 16 away from the connector housing 17 far enough to release the flat cable 14. Leave the flat cable connected to the drive analog card unless you are going to install a new drive analog card or flat cable.

**Note:** The flat cable should be folded as shown in Figure 289 on page CARR-15. This will prevent it from being damaged when installing or removing the cooling pack.

5. Remove the drive logic card, item 2, from the mother board, item 11.

**Note:** You may need to lightly pry the card away from the mother board connector, item 11 at each end of the connector to loosen the drive logic card for removal.

## Replacement of Drive Logic Card—Library Models

**Note:** Before replacing the drive into the library frame, write down the drive serial number that is located on the drive frame, on the left side when you are facing the front of the drive assembly. You will need this number in one of the following steps, if you are installing a **new** drive logic card.

1. Perform the removal procedure in the reverse order, then return here.
2. After installing the new card, restore power to the 3570 Tape Subsystem.
3. If the power-on test completed successfully, go to step 4. **Or**, if the power-on test did not complete successfully, repair as needed, then go to step 4.
4. Perform the “Drive Serial Number—Library Models Only” on page PROC-36 procedure.
5. Perform the “Set Drive Options—Library Models” on page INST-45 procedure.
6. To ensure the microcode EC level of the microcode on the new card is not down level, do the following:
  - a. Press the Mode push button if the operator Options menu is not displayed.
  - b. Select **Services** from the Options menu and press Enter.

- c. Select **Microcode Level** from the Services menu and press Enter to display the EC level and link code of the microcode on the new card.
- d. Look at the latest EC level and link level written in “Microcode EC Level History Log” on page PROC-47.

**Note:** The latest EC level is determined by the link level (LL), as the EC level may not always increment to a higher number. The following example shows that the second entry is the latest level microcode.

```
EC Level   Link Level
6C56789   4D D
3C56789   5B 2 (highest EC level)
```

Compare the displayed EC level (new card) to latest written EC level and link level previously installed. If they compare, go to step 13.

If they **do not** compare, continue with step 7.

7. Select **Cancel** to return to the CE Options menu.
8. Select **Microcode Update** from the FMR Tape menu and press Enter. (See “Updating Microcode from FMR Cartridge (Library Models)” on page PROC-42 for details.)
9. After you load the FMR tape when prompted, the Select EC Level menu displays a series of EC levels.
 

**Note:** If the card has an EC level that is not on the FMR tape, that level of microcode is automatically written on the FMR tape and is also displayed.

If the level of microcode on the card was up-level from the FMR tape, record the new level in “Microcode EC Level History Log” on page PROC-47, unload the tape then go to step 13.

If the level of microcode on the card was down-level from the FMR tape, continue with step 10 to update the microcode on the card.
10. Find the EC level on the menu that matches the EC level written in “Microcode EC Level History Log” on page PROC-47.
11. Select the **EC level and link level** from the menu that matches the written level and press Enter.
12. After the microcode is written into the card, unload the tape and perform a reset (see “Hardware Reset” on page PROC-15) to activate the code.
13. Perform “End of Call” on page PROC-15.
14. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **L01** for the area of failure.
15. Return to the procedure that sent you here.

## Replacement of Drive Logic Card—Drive-Only Models

1. Perform the removal procedure in the reverse order, then return here.
2. After installing the new card, restore power to the 3570 Tape Subsystem.
3. If the power-on test completed successfully, go to step 4. **Or**, if the power-on test did not complete successfully, repair as needed, then go to step 4.
4. Perform the “Verify Fix—Drive-Only Models” on page PROC-9 procedure, then return here.
5. Perform the “Updating Microcode from FMR Cartridge (Drive-Only Models)” on page PROC-46 procedure, then return here.

6. After the microcode is written into the card, unload the tape and perform a reset (see “Hardware Reset” on page PROC-15) to activate the code.
7. Perform “End of Call” on page PROC-15.
8. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **L01** for the area of failure.
9. Return to the procedure that sent you here.



## FID EB: Drive Analog Card

### Removal of Drive Analog Card

#### ATTENTION



The head-actuator assembly and logic cards are ESD sensitive. Special care must be used when handling ESD sensitive parts to be sure that no ESD damage occurs. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4 for details.

**DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!**

See Figure 289 on page CARR-15 for the location of the drive analog card, item 4 then to remove it, follow the steps below if not done before:

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.
2. Perform removal of the “FID EA: Drive Logic Card” on page CARR-16.
3. Refer to Figure 295 on page CARR-24. Remove the 2 screws 1 that hold the retainer 2 to the drive analog card 4 and in turn to the head-actuator assembly 8 . When removing the 2 screws, first loosen 1 screw slightly and then the other. Continue to repeat loosening first one screw slightly and then the other until the screws are removed.

**Note:** When installing these screws again, it is important that they be tightened evenly. Alternate back and forth between the two screws, and **do not over tighten**. Tighten with your fingers, then put just enough pressure on the screws to depress the rubber compression block slightly. Too much torque may cause the screws to be stripped or uneven torque may cause poor contact between the thin-film cables and the contacts on the bottom of the analog card. If a torque driver is available, tighten both screws to a torque of 0.18Nm (24.5oz.in).

4. Remove retainer, item 2 .
5. Remove the insulator 3 .
6. Remove the drive analog card 4 .

#### Notes:

- a. You may need to lightly pry the card away from the mother board at each end of the connector to loosen the drive analog card for removal.
- b. When the drive analog card is removed, the head-actuator thin-film cables 5 and 9 will come off the rubber compression block 6 . See “Replacement of Drive Analog Card” on page CARR-21 for detailed instructions for putting the cables back on during the replacement process.

## Replacement of Drive Analog Card

### ATTENTION



The head-actuator assembly and logic cards are ESD sensitive. Special care must be used when handling ESD sensitive parts to be sure that no ESD damage occurs. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4 for details.

**DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!**

See Figure 290. There should be a Head Cable Installation tool, P/N 08L6270, included with any FRU that requires removal of the drive analog card.

Use Head Cable Installation tool, P/N 08L6270, to help with the installation of the thin-film cables onto the locating pins of the rubber compression block. Also use this tool to hold the thin-film cables in place while the drive analog card is being installed.

**Note:** If the Head Cable Installation tool is not available, a tool can be made from a piece of heavy paper or light weight cardboard. See Figure 296 on page CARR-25 to make a tool, if necessary.

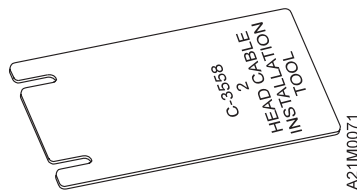


Figure 290. Head Cable Installation Tool P/N 08L6270

**Attention:** See Figure 291. The gold contacts 1 on the ends of the thin-film cables are not insulated. **DO NOT** touch these contacts because static discharge will damage the head-actuator assembly, and fingerprints will cause short circuits or poor contact.

It is okay to touch the **insulated** portion of the thin-film cables, but **DO NOT** touch in the non-insulated gold contact area 1.

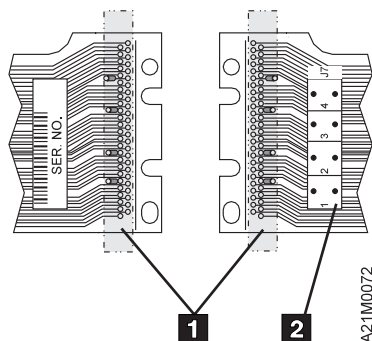
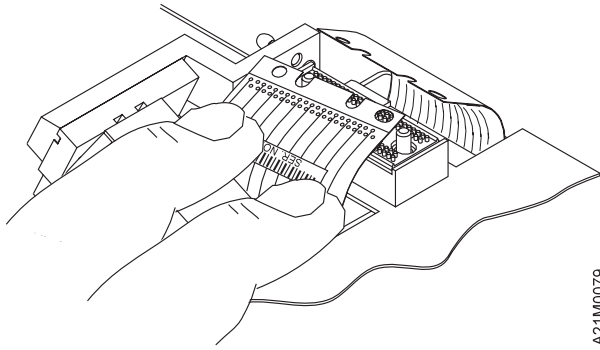


Figure 291. Head-Actuator Cables

**Note:** The following is the **recommended** procedure for installing the thin-film cables on the locating pins of the rubber compression block.

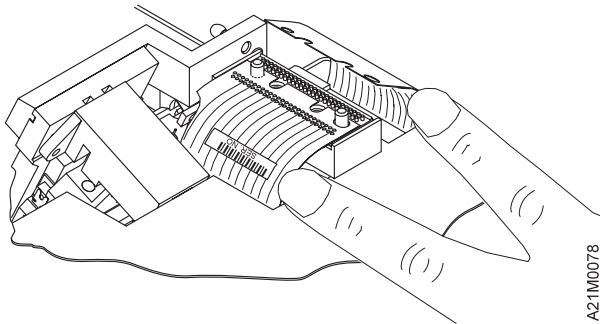
1. See Figure 292 on page CARR-22. With one hand, move the **inner (left)** cable so the contacts are just above the locating pins on the rubber compression block, as shown.



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Figure 292. Thin-film cable installation

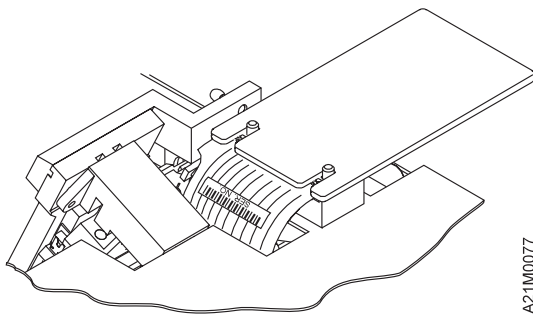
2. With the head cable installation tool in the other hand, use the edge or corner of the tool to push the cable down onto the locating pins.
3. See Figure 293. Maintain a slight amount of pressure on the edge of the inner (left) thin-film cable with one finger, as shown, so the end of the cable will stay on the locating pins without being held down.



A21M0078

Figure 293. Thin-film cable installation

4. Use another finger on the same hand, as shown in Figure 293, to guide the **outer (right)** thin-film cable so it is just above the locating pins. Use the installation tool to push the **outer (right)** thin-film cable down onto the locating pins.
5. See Figure 294. Use the flat portion of the installation tool, as shown, to hold the cables down on the locating pins of the rubber compression block.



A21M0077

Figure 294. Thin-film cable installation

6. While holding the cables in place with the installation tool, plug the drive analog card into the mother board connector.

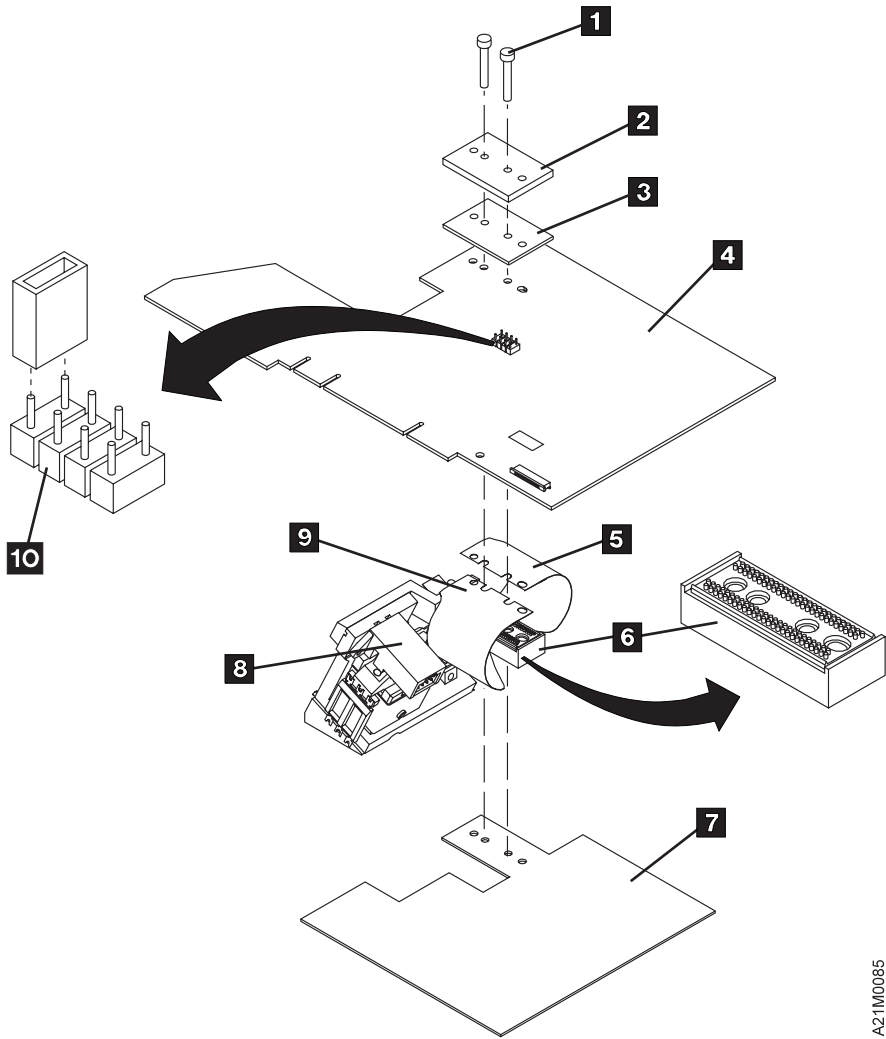
**HINT:** When the drive analog card is in position over the connector, you can let go of the installation tool and it will stay in place by itself. You can then use both hands to insert the card into the mother board connector. Be careful not to let the card lift up enough to allow the installation tool to fall out before you get the card plugged in.

7. Press down lightly on the outside edge of the card while aligning the holes in the card with the pins on the block, then remove the head cable installation tool.
8. Refer to “Removal of Drive Analog Card” on page CARR-20 and perform the removal procedure in the reverse order.

**Notes:**

- a. When installing the retainer, make sure the insulator is between the retainer and the circuit card.
  - b. When installing the two screws that hold the drive analog card, it is important that they be tightened evenly. Alternate back and forth between the two screws, and **do not over tighten**. Tighten with your fingers, then put just enough pressure on the screws to depress the rubber compression block slightly. Too much torque may cause the screws to be stripped or uneven torque may cause poor contact between the thin-film cables and the contacts on the bottom of the analog card. If a torque driver is available, tighten both screws to a torque of 0.18Nm (24.5oz.in).
9. Perform “End of Call” on page PROC-15.
  10. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T21** for the area of failure.
  11. Return to the procedure that sent you here.





A21M0085

Figure 295. Base Drive Head-Actuator Assembly Closeup



## Head-Actuator Cable Holding Tool Template

The following templates may be used by the service person to use as a pattern to cut out from moderately thin cardboard (.040 to .060 inches) a tool that may be used to keep the head-actuator cables in place when removing the drive analog card.

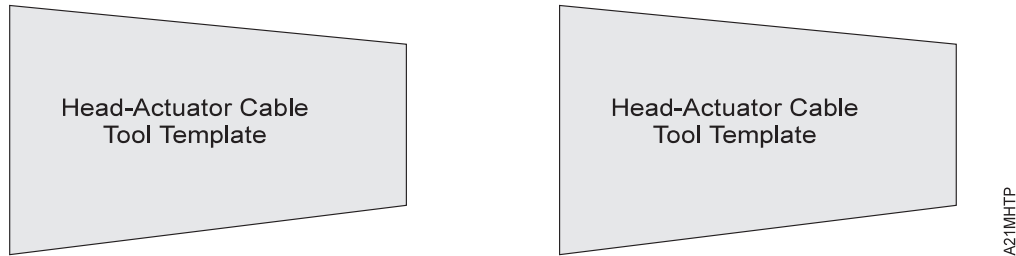


Figure 296. Head-Actuator Cable Holding Tool Template

If you are replacing a FRU that requires removal of the drive analog card, a special head cable installation tool, P/N 08L6270, will be packaged with the new FRU. If the special tool is available, use it instead of the cardboard cutout to hold the head cables in place. See “Replacement of Drive Analog Card” on page CARR-21 for detailed instructions.

## FID D0: Head-Actuator Assembly

This procedure uses a 2.5 mm Allen Wrench.

### Removal of Head-Actuator Assembly

#### ATTENTION



The head-actuator assembly and logic cards are ESD sensitive. Special care must be used when handling ESD sensitive parts, such as the head-actuator assembly to be sure that no ESD damage occurs to the head you are removing or the head you are replacing. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4 for details.

**DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES). MAGNETIZED TOOLS WILL DAMAGE THE HEAD!**

See Figure 289 on page CARR-15 and Figure 295 on page CARR-24 for the location of the head-actuator assembly and associated FRUs.

To remove the head-actuator assembly, item 1, follow the steps below if not done before:

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.
2. Perform removal of the “Drive Assembly Front Cover” on page CARR-15.
3. Perform removal of the “Drive Assembly Top Cover” on page CARR-16.
4. Perform removal of the “FID EA: Drive Logic Card” on page CARR-16.
5. Perform removal of the “FID EB: Drive Analog Card” on page CARR-20.
6. Remove the two head-actuator assembly cables, item 5 and item 15 from the small rubber coated block, item 6.

**Notes:**

- a. The **order** in which the head cables are removed should be maintained when they are re-installed. The proper order to reinstall is:

- 1) Item 15
- 2) Item 5

- b. The small rubber coated block, item 6 , located between the head-actuator assembly thin film cables and the metallic shield, item 7 , must go back in the same orientation that it was removed. **The rubber portion must be up, and the elongated hole must be to the rear of the drive.** as shown in Figure 295 on page CARR-24.

- 7. Remove the small rubber coated block, item 6 by pulling straight up.
- 8. Remove the metallic shield, that has plastic attached to the top side, item 7 and set aside for now.
- 9. Remove the small 2-wire cable from the drive servo card that goes to the head-actuator assembly.
- 10. Remove the small 8-wire flat cable from the drive servo card that goes to the head-actuator assembly.
- 11. Remove the 2.5 mm hex head screw (not shown) holding the head-actuator assembly to the bottom plate. The hex head screw may be accessed through the hole on the bottom of the drive assembly base. Carefully remove the head-actuator assembly as follows:
  - a. Slide the head-actuator assembly back toward the rear to clear the two locating pins.
  - b. The loader assembly contains an arm that engages with a slot on the cleaner brush portion of the head actuator assembly. Rotate the loader assembly gears to move the arm so that it is moved to its **leftmost** position. In this position, the pin on the arm will engage with the slot on the head cleaner brush.
  - c. Next, slide the head-actuator assembly toward the mother board to clear the drive servo card.

**Note:** Use the same precautions when handling the head-actuator assembly that you removed from the drive. When the repair is complete, pack the defective head-actuator assembly in the same way that the FRU was packaged, and return the head-actuator assembly using the UPR process.

## Replacement of Head-Actuator Assembly

**ATTENTION**



**The head-actuator assembly and logic cards are ESD sensitive. Special care must be used when handling ESD sensitive parts, such as the head-actuator assembly to be sure that no ESD damage occurs to the head you are removing or the head you are replacing. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4 for details.**

**DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES). MAGNETIZED TOOLS WILL DAMAGE THE HEAD!**

- 1. Perform the removal procedure in the reverse order.
- 2. Perform “End of Call” on page PROC-15.
- 3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **D08/T22** for the area of failure.
- 4. Return to the procedure that sent you here.

# FID EC: Drive Servo Card and FID E9: Mother Board


## Removal of the Drive Servo Card and Mother Board

**Note:** DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!

Because of limited removal space and obstructions in the drive pack, the drive servo card and mother board should be removed together before either is replaced.

See Figure 289 on page CARR-15, item 8 for location of the drive servo card and item 11 for the mother board.

To remove the drive servo card and mother board follow the steps below if not done before:

**Attention:**  The logic cards are ESD sensitive. Special care must be used when handling ESD parts. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4.

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.
2. Perform removal of the “Drive Assembly Front Cover” on page CARR-15.
3. Perform removal of the “Drive Assembly Top Cover” on page CARR-16.
4. Perform removal of the “FID EA: Drive Logic Card” on page CARR-16.
5. Refer to Figure 295 on page CARR-24 and perform removal of the “FID EB: Drive Analog Card” on page CARR-20.
6. The **order** in which the head cables are removed should be maintained when they are re-installed. The proper order to reinstall is:
  - a. Item 15
  - b. Item 5
7. The small rubber coated block, item 6, located between the head-actuator assembly thin film cables and the metallic shield must go back in the same orientation that it was removed. **The rubber portion must be up, and the elongated hole must be to the rear of the drive.** as shown in Figure 295 on page CARR-24.
8. Remove the flat head cables, items 5 and 15, rubber coated block, item 6, and metal shield, item 7.
9. Disconnect the four cables that run from the loader assembly to the drive servo card.
10. Disconnect the cable going to the IPS Sensor on the head actuator assembly. (You may need to remove the mother board to access the cable.)
11. Tilt the drive unit up so that the bottom of the bottom loader plate, item 9 is showing. Refer to Figure 297 on page CARR-28, and remove two screws, item 1, from the bottom of the loader plate.
12. Refer back to Figure 289 on page CARR-15 and remove the remaining screw, item 14 that secures the drive servo card and mother board to the bottom loader plate.
13. Remove the drive servo card and mother board together.
14. Remove the drive servo card from the mother board.

**Note:** You may need to lightly pry the card away from the mother board connector, item 11 at each end of the connector to loosen the drive servo card for removal.

## Replacement of Drive Servo Card and Mother Board

**Note: DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!**

1. Perform the removal procedure in the reverse order.
2. Perform “End of Call” on page PROC-15.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T53** for the drive servo card and **L02** for the mother board depending on the area of failure.
4. Return to the procedure that sent you here.

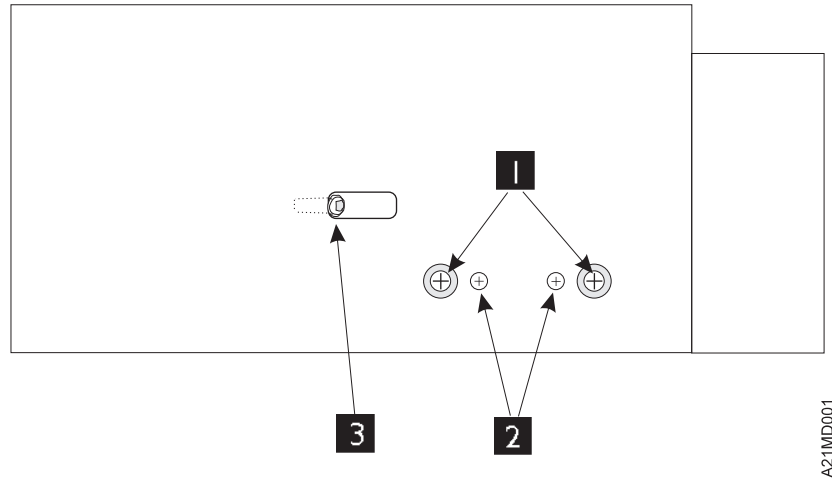


Figure 297. Bottom View of Bottom Loader Plate

## FID E9: Mother Board

**Removal of the Mother Board:** See Figure 289 on page CARR-15, item 11 for location of the mother board, and 8 for location of the drive servo card. The mother board and drive servo card must be removed together before either may be replaced.

To remove the mother board, follow the procedure at “FID EC: Drive Servo Card and FID E9: Mother Board” on page CARR-27.

## FID BC: Loader Assembly

### Removal of the Loader Assembly

**Note: DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!**

See Figure 289 on page CARR-15, item 12 for location of the loader assembly, which is permanently mounted on the bottom plate, item 9 .

To remove the loader assembly follow the steps below if not done before:

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.
2. Perform removal of the “Drive Assembly Front Cover” on page CARR-15.
3. Perform removal of the “Drive Assembly Top Cover” on page CARR-16.

4. Perform removal of the “FID EA: Drive Logic Card” on page CARR-16.
5. Perform removal of the “FID EB: Drive Analog Card” on page CARR-20.
6. Perform removal of the “FID D0: Head-Actuator Assembly” on page CARR-25.
7. Perform removal of the “FID EC: Drive Servo Card and FID E9: Mother Board” on page CARR-27.
8. Perform removal of the “FID E9: Mother Board” on page CARR-28.
9. With all the above removed, what is left is the loader assembly attached to the drive bottom chassis. This is all one FRU.
10. Using a permanent felt tip marker, copy the drive serial number from the old loader assembly to the blank label on the new loader assembly. The serial number is located on the left side when you are facing the front of the loader assembly.

## Replacement of Loader Assembly

**Note: DO NOT USE ANY MAGNETIZED TOOLS ON OR NEAR THE HEAD ASSEMBLY (INCLUDING THIN FILM CABLES) AS THEY WILL DESTROY THE HEAD!**

1. Perform the removal procedure in the reverse order.
2. Perform “End of Call” on page PROC-15.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T45** for the area of failure.
4. Return to the procedure that sent you here.

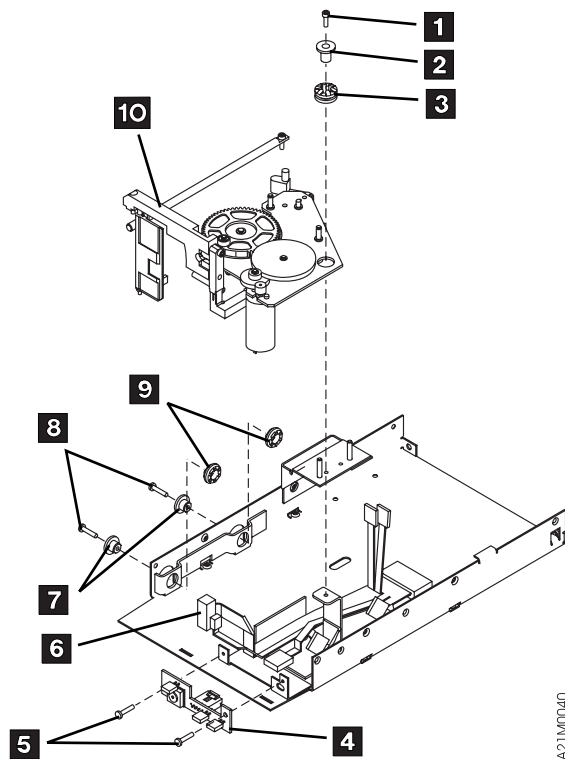


Figure 298. Drive Loader Assembly Exploded View

## FID DA: Drive Sensor Cable

**Removal of the Drive Sensor Cable:** To remove the drive sensor cable follow the steps below if not done before:

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.
2. Perform removal of the "Drive Assembly Top Cover" on page CARR-16.
3. Perform removal of the "FID EA: Drive Logic Card" on page CARR-16.
4. Perform removal of the "FID EB: Drive Analog Card" on page CARR-20.
5. Perform removal of the "Drive Assembly Front Cover" on page CARR-15.
6. Perform removal of the "FID D0: Head-Actuator Assembly" on page CARR-25.
7. Perform removal of the "FID EC: Drive Servo Card and FID E9: Mother Board" on page CARR-27.
8. Perform removal of the "FID E9: Mother Board" on page CARR-28.
9. With all the above removed, what is left is the loader assembly attached to the drive bottom chassis. The drive sensor cable is hidden by the loader assembly, so the loader assembly must be tilted up to expose the drive sensor cable for removal.

Refer to Figure 298 on page CARR-29 and follow the steps below:

1. Remove the side bracket held by two screws that normally holds the drive pack to the base frame. This will allow access to the two side screws, items 8 inside bushings, items 7 that fit into the side rubber shock mounts, items 9 .
2. Remove the two screws.
3. Remove the top screw, item 1 inside bushing, item 2 . Now all the screws that hold the loader assembly to the bottom plate via rubber shock mounts are removed.
4. Carefully move the loader assembly away from the vertical bracket and at the same time tilt the loader assembly up on end to gain access to the drive sensor cable.
5. Disconnect the cable from the reel motors.
6. Unplug the drive sensor cable from the drive LED card, item 4 and remove from the machine.

## Replacement of Drive Sensor Cable

1. Perform the removal procedure in the reverse order.
2. Perform "End of Call" on page PROC-15.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T04** for the area of failure.
4. Return to the procedure that sent you here.

## FID B0: Loader Door

### Removal of Loader Door

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.

**Note:** The loader door may be removed without removing the cooling pack.

2. Pull the front cover forward. It should slide off.

**Note:** Be sure to install the cover back on the drive pack before the call is completed. The cover is required to get proper air flow to the drive logic card.

Refer to Figure 299 on page CARR-31 and perform the following procedures:

1. Loosen screws, item 8, and remove the screw that is nearest the door, item 4.
2. Lift bar, item 7 that holds the door in place and remove spring, item 3.
3. Remove door.

## Replacement of Loader Door

1. Perform the removal procedure in the reverse order.
2. Perform “End of Call” on page PROC-15.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T42** for the area of failure.
4. Return to the procedure that sent you here.

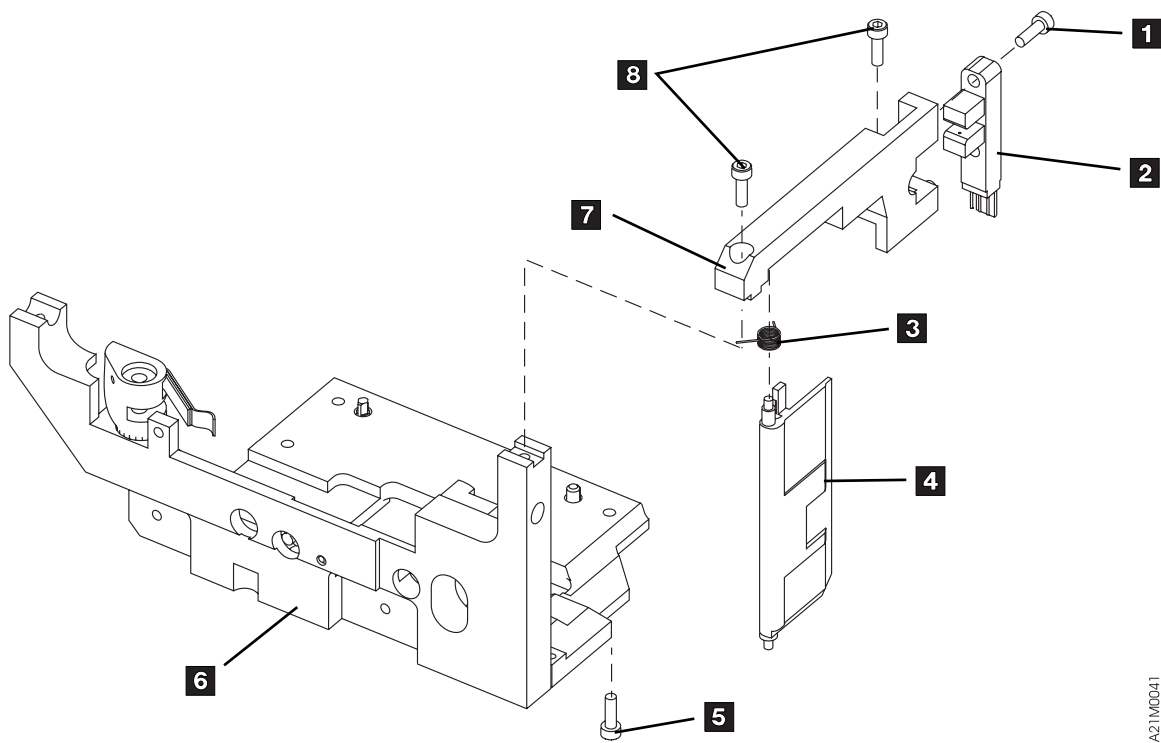


Figure 299. Drive Loader Front Components Exploded View

## FID B1: Drive LED Card

### Removal of Drive LED Card

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.

**Note:** The drive LED card may be removed without removing the drive pack and cooling pack.

- a. For library models, perform removal of the “Library Chassis Covers” on page CARR-4 and “Drive Assembly Front Cover” on page CARR-15.
- b. For Stand-alone drives, perform removal of the front decorative cover and removal of the “Drive Assembly Front Cover” on page CARR-15.


**Note:** Be sure to replace the drive front cover before the call is ended as the cover must be in place to get proper air flow to the drive logic card.

2. Remove the two screws that secure the drive LED card to the mounting bracket.
3. Slowly pull the drive LED card out far enough to disconnect the cable connector from the backside of the card.
4. Remove the drive LED card from the machine.

### Replacement of Drive LED Card

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **L05** for the area of failure.
4. Return to the procedure that sent you here.

### FID C1: Power Supply

**Removal of the Power Supply:** Electrical shock potential in this area.  Ensure that the 3570 power cord is removed from the customer power source before proceeding.

1. Perform the “Prepare the Tape Device for Service” on page PROC-6 procedure, then return here.
2. Perform the “Library Chassis Covers” on page CARR-4 for library machines, **or** the “Decorative Cover—Drive-Only Models” on page CARR-5 for drive-only machines.
3. Disconnect the cooling fan cable connector.
4. If replacing the power supply for drive 1 in 3570 Models B01, B02, B11, B12, B21 and B22, disconnect the power cable at terminal CD5 on the library control card.
5. Disconnect the power cable to the drive (mid-cable connector).  
**Note:** Removal of the two screws in the next step, will allow the back of the power supply to drop. Hold the back of the power supply while removing the two screws.
6. Remove the two screws from the back side of the power supply that secure the power supply to the mounting bracket.
7. Slide the power supply forward and unhook the power supply from the front mounting bracket.
8. Remove the power supply from the machine.

### Replacement of Power Supply

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **P04** for the area of failure.
4. Return to the procedure that sent you here.

### FID C9: Loader Door Open Sensor

**Note:** The loader door open sensor is only found on late machines. If your machine does not have a loader door open sensor, a FID C9 should never appear.



## Removal of Loader Door Open Sensor

1. Perform the prerequisite procedures for your 3570 model listed on Figure 288 on page CARR-13.

**Note:** The loader door open sensor may be removed without removing the cooling pack.

2. Pull the front cover forward. It should slide off.

**Note:** Be sure to install the cover back on the drive pack before the call is completed. The cover is required to get proper air flow to the drive logic card.

Refer to Figure 299 on page CARR-31 and perform the following procedures:

1. Loosen screws that hold the loader door open sensor that is activated by the loader door, item 4.
2. Remove screws and loader door open sensor.

## Replacement of Loader Door Open Sensor

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.



## FID CA: Loader Home Sensor

### Removal of Loader Home Sensor

1. Prepare the drive for service.
2. For drive-only machines:
  - a. Remove the “Decorative Cover—Drive-Only Models” on page CARR-5.
  - b. Remove the “Drive Assembly Front Cover” on page CARR-15.
3. For library machines:
  - a. Perform the “Library Chassis Covers” on page CARR-4.
  - b. Remove the “Drive Assembly Front Cover” on page CARR-15.
4. Refer to Figure 299 on page CARR-31 and remove screw, item 1.
5. **Carefully** remove the cable attached to the bottom of the loader home sensor, item 2 and remove loader home sensor.

**Notes:**

- a. Be careful when disconnecting and reconnecting the loader home sensor cable from the loader home sensor. If the cable is not plugged correctly, the connector can get damaged.
- b. Be careful not to lose the ESD tab when removing the sensor.

## Replacement of Loader Home Sensor

**Note:** Remember to install the ESD tab when installing the sensor.

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.

## FID CB: Internal SCSI Cable

### Removal of Internal SCSI Cable

1. Prepare the drive for service.
2. Perform “Drive Pack, Library Models” on page CARR-8 for library models, or “Drive Pack, Drive-Only Models” on page CARR-8 for drive-only models.
3. Perform “FID B2: Cooling Pack” on page CARR-12 then return here.
4. Remove two screws holding the internal SCSI cable to the cooling pack sheet metal.

### Replacement of Internal SCSI Cable

**Note:** Be careful to route the SCSI cable so that it does not contact the cooling fan blades.

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. Use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C04** for the area of failure.
4. Return to the procedure that sent you here.

## FID DD: Loader Sensors

### Removal of loader sensors

1. The file protect, and cartridge type sensors are part of the loader assembly. Refer to “FID BC: Loader Assembly” on page CARR-28 for removal procedures.
2. The loader door open sensor is replaceable. Refer to “FID C9: Loader Door Open Sensor” on page CARR-32 for removal procedures.
3. The loader home sensor is replaceable. Refer to “FID CA: Loader Home Sensor” on page CARR-33 for removal procedures.
4. The cartridge-present sensor is replaceable as part of the drive logic card. Refer to “FID EA: Drive Logic Card” on page CARR-16 for removal procedures.

### Replacement of loader sensors

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. Return to the procedure that sent you here.

## FID DE: RS-422 Cable-Internal to Drive

### Removal of RS-422 Cable-Internal to Drive

1. Perform the “Library Chassis Covers” on page CARR-4.
2. Remove the RS-422 cable connecting drive 1 to drive 2 (Models B02, B12 and B22 only).
3. Remove two screws that hold the RS-422 cable to the cooling pack.
4. Unplug the cable connector at the mother board and remove the RS-422 cable-internal to drive (Models B02, B12 and B22 drive 2 only).
5. Unplug the cable connector at the mother board and at the library control card, then remove the RS-422 cable-internal to drive (all library models, drive 1 only).

### Replacement of RS-422 Cable-Internal to Drive

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C04** for the area of failure.
4. Return to the procedure that sent you here.

### RS-422 Cable, Drive to Drive

This procedure applies only to Models B02, B12 and B22.

### Removal of RS-422 Cable, Drive to Drive

1. Perform the “Removal of Library Chassis Covers” on page CARR-4
2. Refer to one of the following drawings in the Parts Catalog for the location of the RS-422 Cable between drives:
  - Model B02: “Assembly 6: Desktop Library Assembly, Model B02” on page PARTS-17 item 22
  - Model B12: “Assembly 5: Rackmount Library Assembly, Model B12” on page PARTS-15 item 18
  - Model B22: “Assembly 7: Rackmount Library Assembly, Model B22” on page PARTS-19 item 18
3. Remove the RS-422 cable connecting drive 1 to drive 2 (Models B02, B12 and B22 only).

### Replacement of RS-422 Cable, Drive to Drive

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C04** for the area of failure.
4. Return to the procedure that sent you here.



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## Removal and Replacement Procedures for the Library

The following removal and replacement procedures are for all models of the library and are listed by FID order.

### FID 90: Library Operator Panel Display

#### Removal of Library Operator Panel Display

1. "Prepare the Tape Device for Service" on page PROC-6.

**Note: Attention:**  The logic cards are ESD sensitive. Special care must be used when handling ESD parts. See "Working with Electrostatic Discharge (ESD) Parts" on page PROC-4.

2. Remove the library operator panel display from the front panel by pushing down on the top of the library operator panel display, and using both thumbs, pivoting the assembly out. When replacing, put the bottom in first, and pivot the top up and into the front cover assembly.
3. Remove the cable that goes from the back of the library operator panel display to the library control card at the display end by squeezing the two retaining springs in the cable connector.
4. Remove the three screws holding the LCD card to the panel.
5. Remove the LCD card.


#### Replacement of Library Operator Panel Display

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **L05** for the area of failure.
4. Return to the procedure that sent you here.

### FID 91: Library Operator Panel Display Cable

#### Removal of Library Operator Panel Display Cable

1. "Prepare the Tape Device for Service" on page PROC-6.

**Note: Attention:**  The logic cards are ESD sensitive. Special care must be used when handling ESD parts. See "Working with Electrostatic Discharge (ESD) Parts" on page PROC-4.

2. Remove the library operator panel display from the front panel.
3. Remove the cable that goes from the back of the library operator panel display to the library control card at the display end.
4. Remove the cable at the library control card end. The connector at that end is shown as item E on Figure 301 on page CARR-39 and can be removed by squeezing the two holding springs and lifting up.
5. Unlace cable from cable retention hardware and remove cable.

#### Replacement of Library Operator Panel Display Cable

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C03** for the area of failure.
4. Return to the procedure that sent you here.

## FID 92: Accessor Assembly

### Removal of Accessor Assembly

1. Perform the “FID 9A: Picker Assembly” on page CARR-40 removal procedure, then return here.
2. Refer to Figure 301 on page CARR-39, item F, and remove the cable between the library control card and accessor motor assembly (CD6) from the library control card end, and release the cable from the cable retention hardware.
3. Remove the motor tach cable from the accessor motor assembly.
4. Remove the three inside screws on the right side of the machine, and the three inside screws on the left side of the machine that secure the accessor assembly to the side plates. The assembly should now rest on the side wall support pins.
5. Lift and remove the accessor assembly, lead screw, and accessor motor assembly out of the machine.
6. Remove the accessor motor assembly from the accessor assembly and install it on the new accessor assembly. See “FID 95: Accessor Motor Assembly” on page CARR-38.

**Note:** When installing the accessor motor assembly, make sure that the gear on the motor shaft fully meshes with the gear on the accessor assembly. Also note the orientation of the accessor motor assembly tach cable connector. The tach cable connector should face the rear of the machine.

### Replacement of Accessor Assembly

1. Perform the removal procedure steps in the reverse order except for the step concerning the accessor motor assembly.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T14** for the area of failure.
4. Return to the procedure that sent you here.

## FID 94: Bar Code Reader

### Removal of Bar Code Reader

1. Refer to Figure 300 on page CARR-38.
2. Refer to “FID 9A: Picker Assembly” on page CARR-40 and remove the picker assembly.
3. Disconnect the bar code reader cable 1 .  
**Note:** The top of connector has a locking tab.  
Slide the tab up and disconnect the cable.
4. The bar code reader is held in place by 4 snap connectors. With the blade of a screwdriver, pry up at 2 to disengage the first connector.
5. Pry up at the picker end of each mounting post, items 3 and remove the reader.
6. Remove the bar code reader interface card from the library control card. See G in Figure 301 on page CARR-39.

### Replacement of Bar Code Reader

1. Replace the bar code interface card by plugging it on the library control card.
2. Refer to Figure 300 on page CARR-38. The gear on the bar code reader has an arrow that must be aligned with the arrow on the picker assembly gear 4 . Align the arrows and snap in place 2 .
3. Snap the three remaining connectors in place 3 .

4. Reconnect the connector 1 .

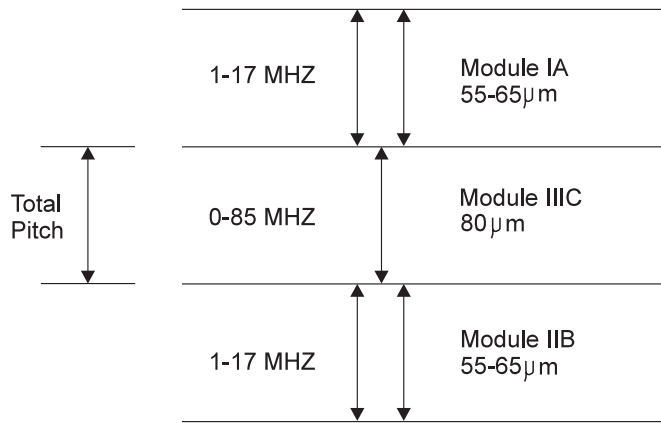


Figure 1 Three Module Write Pattern

3570R023

Figure 300. Barcode Reader

## FID 95: Accessor Motor Assembly

### Removal of Accessor Motor Assembly

**Note:** Shiny picker belts can cause FID 95 failures due to infrared light reflecting from the belts onto the Cartridge Present sensor. If the picker belts must be cleaned for FID 95 problems, use a lint-free cloth and some alcohol to clean the belts. Be sure to wait until the belts have completely dried before using the library.

1. Refer to Figure 301 on page CARR-39, item F, and remove the cable between the library control card and accessor motor assembly (CD6) from the library control card end.
2. Remove the motor tach cable from the accessor motor assembly.
3. Loosen the set screw and remove the small pulley on the accessor motor assembly shaft.
4. Remove the four outside screws on the right side of the machine, and the four outside screws on the left side of the machine, that hold the accessor motor assembly to the accessor assembly.
5. Remove the accessor motor assembly.

**Note:** Observe the orientation of the accessor motor assembly. When replacing the unit, the tach cable connector should face the rear of the machine.

### Replacement of Accessor Motor Assembly


1. Perform the removal procedure steps in the reverse order.

**Note:** When installing the accessor motor assembly, make sure that the gear on the motor shaft fully meshes with the gear on the accessor assembly.

2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T17** for the area of failure.
4. Return to the procedure that sent you here.

## FID 97: Library Control Card

## Removal of Library Control Card

**Note: Attention:**  The logic cards are ESD sensitive. Special care must be used when handling ESD parts. See “Working with Electrostatic Discharge (ESD) Parts” on page PROC-4.

Refer to Figure 301 on page CARR-39 for a pictorial of the cable connections for the following steps:

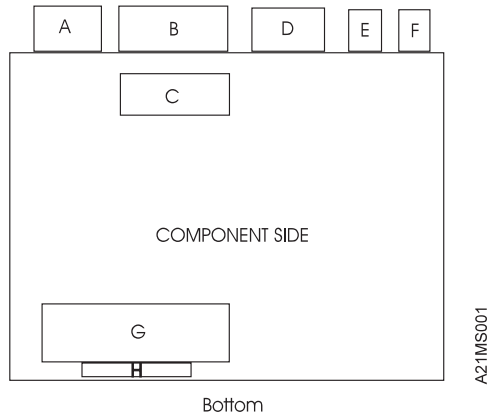


Figure 301. Library Control Card Cable and Bar Code Reader Card Layout

1. Prepare the drive for service.
2. Remove the six cables from the library control card:
  - a. CD1=A, Library interface cable (squeeze springs)
  - b. CD2=B, Library sensor cable(pivot out plastic retainers)
  - c. CD3=C, Picker cable(lock is under connector)
  - d. CD4=D, From Power supply
  - e. CD5=E, Library operator panel display cable(squeeze springs)
  - f. CD6=F, Accessor motor assembly drive
  - g. G, Bar Code Reader Card
  - h. H, Bar Code Reader Connector
3. Remove top retaining bracket and screw that holds the library control card in place. The screw is located on the right outside of the machine.
4. Lift and remove the library control card from the machine.
5. If the Bar Code Reader feature is installed on the library, and you are replacing the library control card with a new card, remove the Bar Code Reader card, item G in Figure 301 from the old card and install it on the new card.

## Replacement of Library Control Card

**Note:** If you are replacing the library control card in a Model B01 or B11 and the microcode installed in the tape drive is link 2\_85A, 2\_87F or 2\_903, the microcode must be updated to a later level, (for example, 3\_xxx). If attached to a RS/6000 System, order FMR Diskette P/N 05H9510. If attached to AS/400, order FMR Tape Cartridge P/N 05H9506.

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T15** for the area of failure.
4. Return to the procedure that sent you here.

## FID 99: Picker Cable

## Removal of Picker Cable

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Refer to Figure 301, item C, and disconnect the cable connector (CD3) from the library control card by releasing the lock on the bottom of the connector.
3. Disconnect the picker cable from the picker assembly.
4. Slide the cable out from under the existing hardware, and remove.

**Note:** The cable will be secured to the base with adhesive. Carefully pull the cable upward from either end until it comes free.

## Replacement of Picker Cable

1. Use the old cable as a pattern to fold the new cable.
2. Perform the removal procedure steps in the reverse order.
3. Prepare the drive for customer operation.
4. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C03** for the area of failure.
5. Return to the procedure that sent you here.

## FID 9A: Picker Assembly

**Note:** Cleaning of the picker belts is not recommended to correct cartridge slipping problems. If the cartridges are slipping on the belts, the picker assembly should be replaced.

Shiny picker belts can cause FID 95 failures due to infrared light reflecting from the belts onto the Cartridge Present sensor.

If the picker belts must be cleaned for FID 95 problems, or because a FRU is not readily available, use a lint-free cloth and some alcohol to clean the belts. Be sure to wait until the belts have completely dried before using the library.

## Removal of Picker Assembly

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the four screws on top that secure the picker assembly to the accessor assembly.
3. Disconnect the picker cable (flex cable) from the library control card to the picker assembly, at the picker assembly end only.
4. Remove the picker assembly from the machine.

**Note:** Observe the orientation of the picker assembly. The springs are to the right, and the gears are to the left, facing from the front of the machine.

5. If the Bar Code Reader feature is installed on the library, and you are replacing the picker assembly with a new one, remove the Bar Code Reader from the old picker assembly and install it on the new one. See "FID 94: Bar Code Reader" on page CARR-37 for procedure.

## Replacement of Picker Assembly

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T12** for the area of failure.
4. Return to the procedure that sent you here.



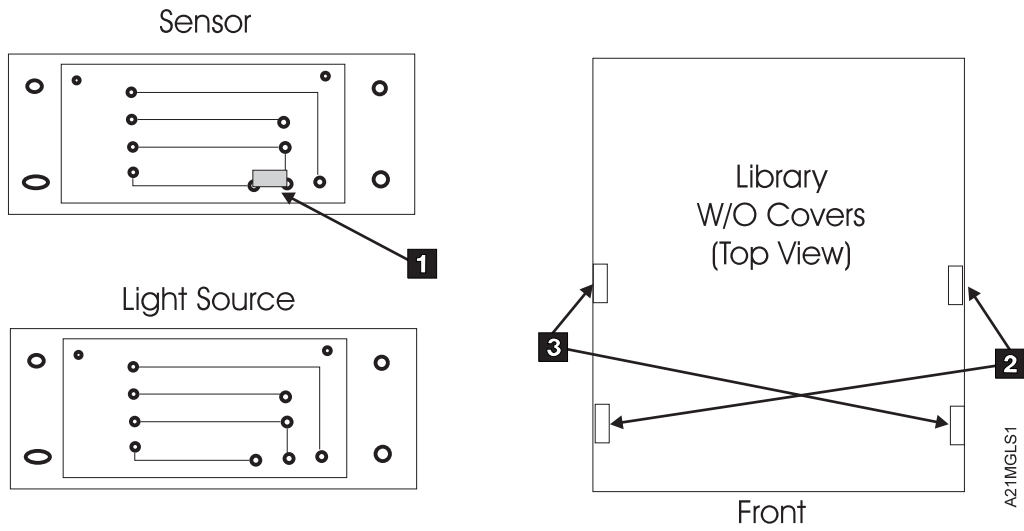


Figure 302. Library Global Sensor Component Identification and Locations

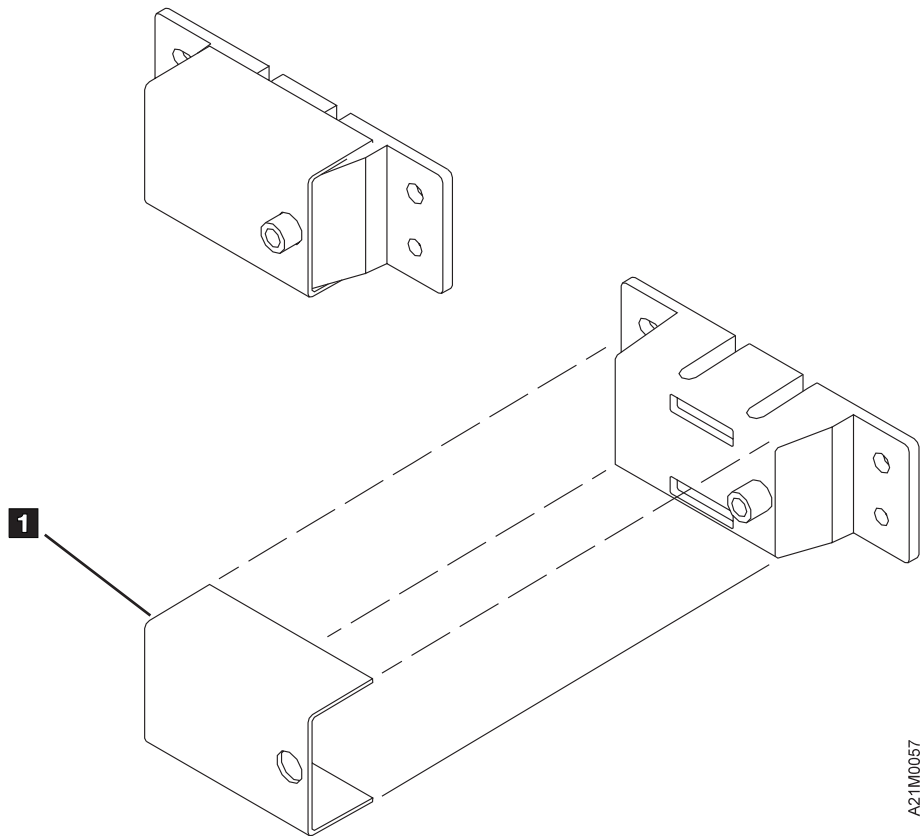


Figure 303. Library Global Sensor Component Plastic Covers

## FID 9B: Drive Global Sensor Pair

## Removal of Drive Global Sensor Pair

**Note:** When replacing any part of the drive global sensor pair, replace both the sensor and the light source at the same time. Be aware that the two parts **look very much alike** and will not work if interchanged. Refer to Figure 302 and note that the sensor has a small component, item 1, soldered on the circuit board while the light source is missing this component. Also note from the figure where the light sources, item 2 and sensors, item 3 are located in the library.

1. "Prepare the Tape Device for Service" on page PROC-6.
2. You may have to push the picker assembly out of the way to gain access to the sensor.

**Note:** On some libraries, there may be plastic snap-on covers installed on the global sensor and light source. If so, pull the covers off to install them on the new sensor pair. See Figure 303 on page CARR-41, item 1.

### Left side light source

- a. Disconnect the light source cable at the light source.
- b. Remove the two screws that secure the light source to the left side chassis,
- c. Remove the light source.

### Right side sensor

- a. Disconnect the sensor cable at the sensor.
- b. Remove the two screws that secure the sensor to the right side chassis.
- c. Remove the sensor.

## Replacement of Drive Global Sensor Pair

1. Perform the removal procedure steps in the reverse order.
2. Position the sensor and light source over their respective alignment pins, then secure with screws.
3. If you removed plastic snap-on covers from the sensor and light source, re-install the covers.

**Note:** Be sure that the hole in the cover aligns with the sensor and the light source.

4. Prepare the drive for customer operation.
5. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
6. Return to the procedure that sent you here.

## FID 9C: Magazine Global Sensor Pair

### Removal of Magazine Global Sensor Pair

**Note:** When replacing any part of the magazine global sensor pair, replace both the sensor and the light source at the same time. Be aware that the two parts **look very much alike** and will not work if interchanged. Refer to Figure 302 on page CARR-41 and note that the sensor has a small component, item 1, soldered on the circuit board while the light source is missing this component. Also note from the figure where the light sources, item 2 and sensors, item 3 are located in the library.

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the magazines if present.

**Note:** On some libraries, there may be plastic snap-on covers installed on the global sensor and light source. If so, pull the covers off to install them on the new sensor pair. See Figure 303 on page CARR-41, item 1.

### Left side sensor

- a. Disconnect the cable from the sensor on the left side.
- b. Remove the two screws securing the sensor to the left side chassis.
- c. Remove the sensor.

### 3. Right side light source

- a. Disconnect the cable at the light source.
- b. Remove the two screws securing the light source to the right side chassis.
- c. Remove the light source.

## Replacement of Magazine Global Sensor Pair

1. Perform the removal procedure steps in the reverse order.
2. Position the sensor and light source over their respective alignment pins, then secure with screws.
3. If you removed plastic snap-on covers from the sensor and light source, re-install the covers.

**Note:** Be sure that the hole in the cover aligns with the sensor and the light source.

4. Prepare the drive for customer operation.
5. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
6. Return to the procedure that sent you here.

## FID 9D: Library Front Cover Assembly

There are at least 3 styles of hinges and 2 styles of library front cover assemblies. Removal and replacement is different on each one. Study the drawings at Figure 304 on page CARR-45, Figure 305 on page CARR-46 and Figure 306 on page CARR-46, and decide which style front cover assembly is on the problem machine. Here's how you can tell.

Oldest style	Look behind the removable operator panel, item 2 on Figure 304 on page CARR-45. Remove the library operator panel display assembly by pushing down and tilting out from the top. If there is no access hole to a screw behind the library operator panel display, you have the old style front cover assembly. Follow the procedure at "Removal of Library Front Cover Assembly (Old Style)" on page CARR-47.
Newer style	Look at Figure 305 on page CARR-46 and if your hinges match that type, you have a newer style. Follow the procedure at "Removal of Library Front Cover Assembly (Newer Style)" but watch for notes concerning hinge removal unique to this style.
Newest style	Look at Figure 306 on page CARR-46 and if your hinges match that type, you have the newest style. Follow the procedure at "Removal of Library Front Cover Assembly (Newer Style)" but watch for notes concerning hinge removal unique to this style.

## Removal of Library Front Cover Assembly (Newer Style)

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Refer to Figure 304 on page CARR-45 and remove the library operator panel display assembly, item 2, by pushing down and tilting out from the top.
3. Disconnect the library operator panel display cable from the library operator panel display.
4. Set the library operator panel display and library operator panel display cable aside for now.
5. Remove any magazines that are installed.

### Notes:

- a. Read the rest of this procedure carefully before continuing. The Library front cover assembly has many screws, but only six secure the front cover and two to four secure the hinges depending on the style that your machine has. Pay close attention to the next few steps and it will save you some time.
- b. The front cover (plastic) and the metal mounting plate are separate parts, and the metal mounting plate is not removed.

6. Refer to Figure 304 on page CARR-45, locate the access hole and screw, item 4 , and remove the screw.
7. Carefully place a small flat blade screw driver at the **bottom** of the IBM logo, item 1 , insert the screw driver under the logo and at a slight angle, and pry it up and out. The logo should come out easily, and provide access to one of the holding screws. Remove the screw, item 3 which was hidden by the logo.
8. Remove upper screw, item 5 and the three lower screws, item 6 . The upper and lower screws are partially surrounded by a plastic “channel” that provides strength to the assembly.
9. If you have a set of hinges that look similar to those in Figure 305 on page CARR-46, remove screws 1 , 2 (if it exists), and 3 . **Do not** remove screws 4 and 5 . They do not need to be removed.
10. If you have a set of hinges that look similar to those in Figure 306 on page CARR-46, remove screws 1 and 2 . **Do not** remove screws 3 or 4 . They do not need to be removed.
11. Slowly pull on the front cover assembly enough to gain access to the cables leading to the library LED card and the library door open sensor.
12. Disconnect the cable connectors and remove the library front cover assembly.

**Note:** It may be easier to remove the library door open sensor from its bracket than to disconnect the connector.

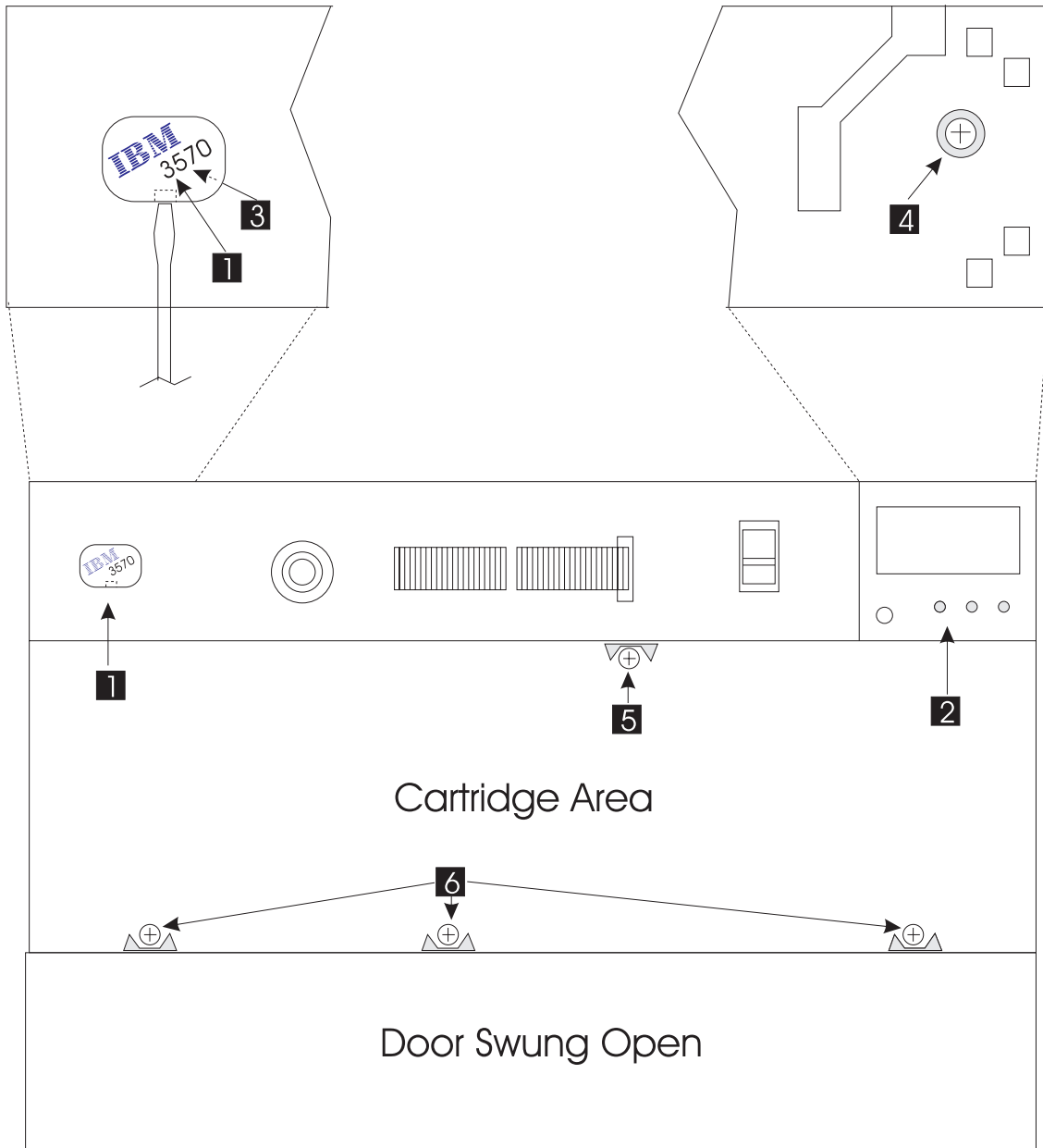
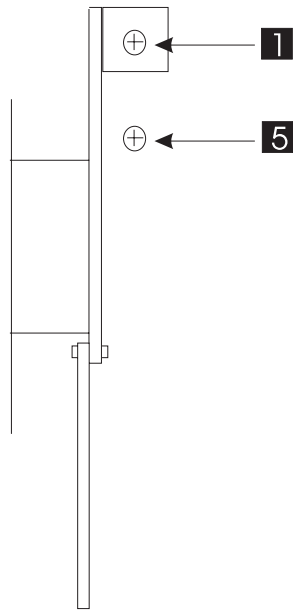
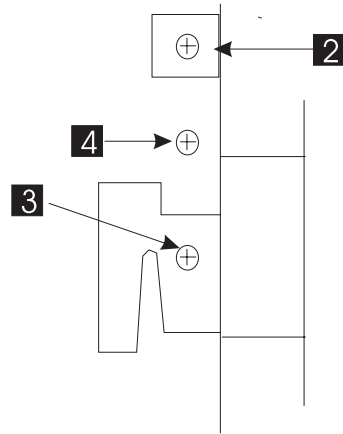


Figure 304. Library Front Door Assembly—Holding Screws

### Front Door Left Hinge



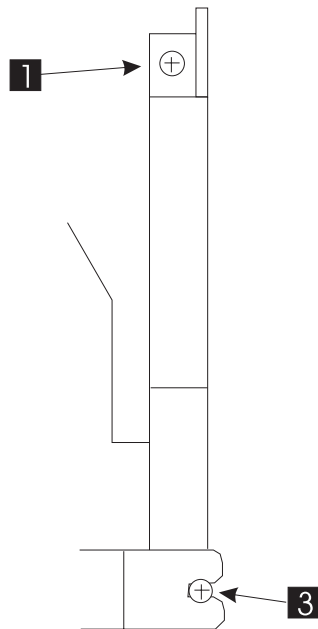
### Front Door Right Hinge



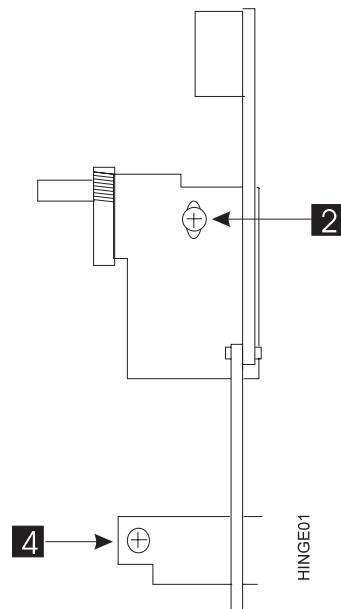
HINGE02

Figure 305. Library Front Door Assembly—Newer Style Hinges

### Front Door Left Hinge



### Front Door Right Hinge



HINGE01

Figure 306. Library Front Door Assembly—Newest Style Hinges

## Removal of Library Front Cover Assembly (Old Style)

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the library operator panel display assembly by tilting out from the top.
3. Disconnect the library operator panel display cable from the library operator panel display.
4. Set the library operator panel display and library operator panel display cable aside for now.
5. Remove any magazines that are installed.

### Notes:

- a. Read the rest of this procedure carefully before continuing. The Library front cover assembly has many screws, but only six secure the front cover and three are hinge screws. Pay close attention to the next few steps and it will save you some time.
  - b. The front cover and the metal mounting plate are separate parts, and the metal mounting plate is not removed.
6. Refer to Figure 307, and remove three screws, item 1, on the inside near the top of the front cover assembly. The library operator panel display cable hole, item 2 and rear of key lock, item 3 are shown as reference.
  7. From the front of the library, open the library door.
  8. Refer to Figure 308 on page CARR-48, and remove the three screws, item 1 that line up with the raised areas in the front cover assembly, near the bottom.
  9. Remove two screws, item 2, on both sides of the library door that secure the bottom bracket of the door stops.
  10. Slowly pull on the front cover assembly enough to gain access to the cables leading to the library LED card and the library door open sensor.
  11. Disconnect the cable connectors and remove the library front cover assembly.

**Note:** It may be easier to remove the library door open sensor from its bracket than to disconnect the connector.

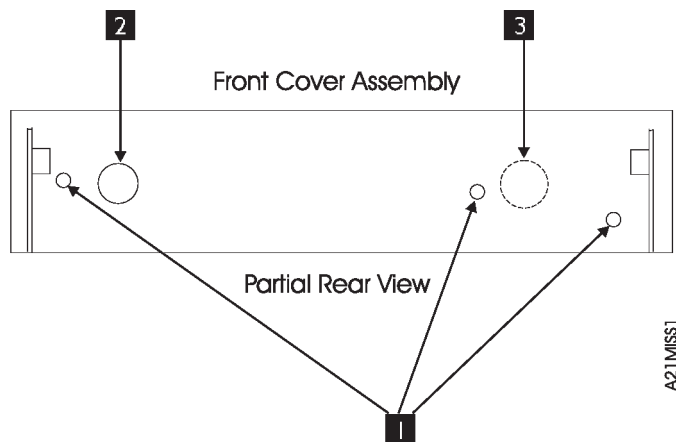


Figure 307. Library Front Door Assembly—Rear View Holding Screws

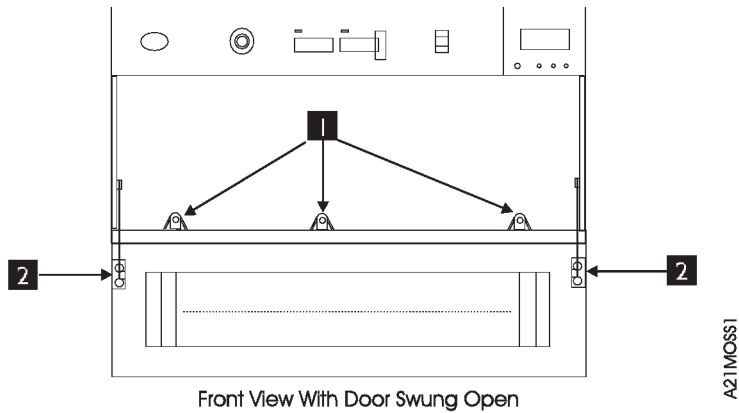


Figure 308. Library Front Door Assembly—Front View Holding Screws

### Replacement of Library Front Cover Assembly (All Styles)

1. Perform the removal procedure steps in the reverse order.
2. When re-installing the front cover assembly, ensure that the Power On/Off switch does not bind when tightening the cover holding screws. Alignment of the front cover assembly is critical.
3. Prepare the drive for customer operation.
4. Return to the procedure that sent you here.

### FID 9E: Priority Cell Cartridge-Present Sensor

#### Removal of Priority Cell Cartridge-Present Sensor

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the magazine if present.
3. Disconnect the cable from the sensor.
4. Remove the two screws securing the sensor to the mounting plate.
5. Remove the sensor.

#### Replacement of Priority Cell Cartridge-Present Sensor

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.

### FID A0: Magazine 2 Sensor

#### Removal of Magazine 2 Sensor

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the magazine if present.
3. Disconnect the cable from the sensor.
4. Remove the screw securing the sensor to the mounting plate.
5. Remove the sensor.



## Replacement of Magazine 2 Sensor

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.

## FID A1: Magazine 1 Sensor

### Removal of Magazine 1 Sensor

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the magazine if present.
3. Disconnect the cable from the sensor.
4. Remove the screw securing the sensor to the mounting plate.
5. Remove the sensor.

### Replacement of Magazine 1 Sensor

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.



## FID A2: Library Interface Cable

### Removal of Library Interface Cable

1. "Prepare the Tape Device for Service" on page PROC-6.  
**Note:** Removal of the SCSI connector may disrupt the host system if the 3570 is not the last drive in the string, and is not terminated.
2. Remove the SCSI cable and terminator if the last drive in a string, or both cables if in the middle of the string.
3. Remove 4 screws that secure a cover in the back of the machine.
4. Remove the cover and expose access to the library interface cable.
5. Remove one end of the library interface cable from the rear of the drive pack, and the other from the library control card.

### Replacement of Library Interface Cable

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C03** for the area of failure.
4. Return to the procedure that sent you here.

## FID A3: Cleaner Cartridge-Present Sensor

## Removal of Cleaner Cartridge-Present Sensor

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Remove the two screws securing the cleaner cell to the bracket. These screws may be seen easily from the front of the machine.
3. Pull the cleaner cell far enough to disconnect the sensor cable.
4. Remove the two screws securing the micro-switch (sensor) to the cleaner cell.
5. Remove the micro-switch (sensor).

## Replacement of Cleaner Cartridge-Present Sensor

1. Install the new micro switch.
2. Install a cartridge into the cleaner- cartridge holder and adjust the micro switch until there is continuity between the two pins. Adjust further until there is no free play in the micro switch actuator.

**Note:** Do not adjust the switch beyond the point of free play or you may bend or otherwise damage the actuator.

3. Tighten the switch holding screws.
4. Remove the cartridge and re-install the wires removed earlier.
5. Reinstall the cleaner- cartridge holder into the library.
6. Prepare the drive for customer operation.
7. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
8. Return to the procedure that sent you here.

## FID A5: Library Sensor Cable

### Removal of library sensor cable

1. "Prepare the Tape Device for Service" on page PROC-6.
2. Refer to Figure 301 on page CARR-39, item B, and disconnect the cable connector (CD2) from the library control card.
3. Perform the removal procedure for "FID 9D: Library Front Cover Assembly" on page CARR-43.
4. Disconnect the cable connectors from the following sensors and LEDs:
  - a. Cleaner cartridge- present sensor
  - b. Accessor motor calibrate sensor
  - c. Drive global sensor pair (right side)
  - d. Magazine global sensor pair(right side)
  - e. Priority cell cartridge-present sensor
  - f. Library LED card
  - g. Library door open sensor
  - h. Drive global sensor pair (left side)
  - i. Magazine global sensor pair (left side)
5. Open the cable clamps as required to remove the cable from the machine.

### Replacement of Library Sensor Cable

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C03** for the area of failure.
4. Return to the procedure that sent you here.

## FID A6: Library LED Card

### Removal of Library LED Card

1. "Prepare the Tape Device for Service" on page PROC-6 and then return here.
2. Perform removal of the "Library Chassis Covers" on page CARR-4.
3. Perform removal of the "FID 9D: Library Front Cover Assembly" on page CARR-43.
4. With the front cover lying face down on a soft surface, remove the two screws holding the library LED card to the front cover.
5. Lift and remove the library LED card and holding frame out of the Library front cover.

### Replacement of Library LED Card

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **T31** for the area of failure.
4. Return to the procedure that sent you here.

## FID AA: Library Door Open Sensor

### Removal of Library Door Open Sensor

1. "Prepare the Tape Device for Service" on page PROC-6 and then return here.
2. Perform removal of the "Library Chassis Covers" on page CARR-4.
3. Perform removal of the "FID 9D: Library Front Cover Assembly" on page CARR-43.
4. With the front cover lying face down on a soft surface, remove the library door open sensor assembly from its bracket.

### Replacement of Library Door Open Sensor

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **L05** for the area of failure.
4. Return to the procedure that sent you here.

## FID DB: AC Switch and Cable Assembly

### Removal of Library Door Open Sensor

1. "Prepare the Tape Device for Service" on page PROC-6 and then return here.
2. Perform removal of the "Library Chassis Covers" on page CARR-4.
3. Perform removal of the "FID 9D: Library Front Cover Assembly" on page CARR-43.
4. Set the front cover aside for now.
5. Remove the AC On/Off switch cable from the power supply that supplies power to drive 1.
6. If you are working on a dual drive model, remove the AC On/Off power extension cable that supplies power to drive 2 power supply from the rear of the AC On/Off switch.
7. Open the cable clamps as necessary to remove the cable from the trough.
8. Remove the AC On/Off switch feed-through cable from the mounting bracket.
9. Remove the two screws that secure the AC On/Off switch to the front chasis mounting bracket.
10. Remove the AC switch and cable from the machine.



## **Replacement of AC Switch and Cable Assembly**

1. Perform the removal procedure steps in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C02** for the area of failure.
4. Return to the procedure that sent you here.

## **FID DC: AC Power Cord**

### **Removal of AC Power Cord**

1. Prepare the drive for service.
2. Remove power from the device.
3. Remove the power connection from the customer wall outlet.
4. Remove the power connection from the device.

### **Replacement of AC Power Cord**

1. Perform the removal procedure in the reverse order.
2. Prepare the drive for customer operation.
3. If this part is being replaced with a new part, use your local procedures to report the FRU part number for the FID and use technical area code (TAC) **C02** for the area of failure.
4. Return to the procedure that sent you here.

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# APPENDIX A

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## TAPEUTIL in a Sun (Solaris) System Environment

A SCSI Tape and Medium Changer Utility Program called *tapeutil* is provided with the IBM SCSI Tape and Medium Changer Device Driver for Solaris and installed in the */opt/IBMtape* directory as part of the IBMtape package. This program fulfills several purposes:

It provides the following service aids for IBM tape subsystems:

- Query Device Type/Verify Device Attachment
- Query Device Serial Number
- Query Device Microcode Level
- Force Device Diagnostic Dump
- Store Device Diagnostic Dump
- Download Device Microcode

It provides a menu-driven test tool for exercising or testing IBM tape and medium changer devices with a full set of supported operations:

- Reading/Writing Data
- Tape Motion Commands
- Setting/Displaying Device Information/Status
- Mounting/Demounting Cartridges
- Cartridge Inventory

In addition to the menu-driven front end, the *tapeutil* program provides a command-line interface that is convenient for use in shell scripts.

**Note:** When using the command-line calls to the *tapeutil* program, the tape device is opened and closed for each invocation. Configuration parameters that are changed in one call to the *tapeutil* program are returned to default values when the device is closed.

The source code for the *tapeutil* program is provided for example purposes, and is installed in the */opt/IBMtape* directory during the IBMtape package installation. This source code is commented and demonstrates calls to all of the supported device driver entry points and *ioctl* commands, thus giving the application developer a starting point for interfacing to the IBMtape device driver.

The *tapeutil* program provides both an interactive menu-driven interface as well as a command-line interface. If the *tapeutil* program is invoked with no command-line parameters, the menu-driven version will be started. In the menu-driven version, the device to be operated on should first be opened using option 1. Other options may then be selected.

The user will be prompted for additional information if required for the specific options selected. The results of a command are displayed after it is executed. If an error occurs for the command, error information and device sense data are displayed. The device can be closed using option 2, or it will automatically be closed when the Quit option is selected. The menu is automatically displayed once when the program is first invoked. To prevent unnecessary scrolling of the screen, the menu is not automatically displayed again after each command, but is instead refreshed only after the M (menu refresh) command is entered.

Figure 309 on page APPENDA-3 shows the menu that is displayed by the *tapeutil* program.

IBM SCSI TAPE & MEDIUM CHANGER UTILITY PROGRAM	
GENERAL COMMANDS	BASIC SCSI COMMANDS
1: Open Device	9: Test Unit Ready
2: Close Device	1 : Inquiry
D: Device Type	11: Request Sense
M: Menu Refresh	12: Reserve
Q: Quit Program	13: Release
SERVICE COMMANDS	MEDIUM CHANGER COMMANDS
3: Query Serial Number	14: Move Medium
4: Query Microcode Level	15: Position To Element
5: Force Dump	16: Element Information
6: Store Dump	17: Inventory
7: Download Microcode	18: Audit
8: Format Cartridge	19: Lock/Unlock Door
TAPE DRIVE COMMANDS	
2 : Read Data	32: Locate End Of Data
21: Write Data	33: Get Record Size
22: Write File Mark	34: Set Record Size
23: Erase Tape	35: Get Device Status
24: Rewind	36: Get Device Info
25: Retension	37: Get Media Info
26: Offline	38: Get Position
27: Load/Unload Tape	39: Set Position
28: Forward Space File	4 : Get Parameter
29: Backward Space File	41: Set Parameter
3 : Forward Space Record	42: Sync Buffer
31: Backward Space Record	43: Display Message

Figure 309. TAPEUTIL Program Menu

If command-line parameters are provided when the program is invoked, the command-line mode will be started. For each command-line execution of the program, the device is first opened, the specific command is issued, and the device is then closed. The program can be driven from within a shell script if desired. Results of the operation will be displayed only when executed in verbose mode. No information is displayed when not in verbose mode. This is particularly useful for quiet shell script implementations. A completion code, as defined in `/usr/include/sys/errno.h` for the operation requested is always returned from the program upon exit (in both verbose and quiet mode).

**Note:** Options 4 through 8 of the `tapeutil` program supported **only** by the 3570 and the 3590.

The usage of the `tapeutil` program in command-line mode is as follows:

```
tapeutil -f device -o operation [options]
```

where **device** is the name of the tape device special file (for example: `/dev/rmt/1st`) and **operation** is one of the values listed below. The device special file and the operation are required. The specific **options** associated with a particular operation are indicated in Figure 310, Figure 311 on page APPENDA-4, Figure 312 on page APPENDA-4 and Figure 313 on page APPENDA-5. Parameters enclosed in square brackets are optional. All others are required.

Figure 310. Service Commands and Syntax

Service Commands	Syntax
Query Serial Number	tapeutil -f f.-o qsn [-w w][-v]
Query Microcode Level	tapeutil -f f.-o qmc [-w w][-v]
Force Dump	tapeutil -f f.-o fdp [-w w][-v]
Store Dump	tapeutil -f f.-o sdp [-w w][-v] -z z
Download Microcode	tapeutil -f f.-o dmc [-w w][-v] -z z
Format Cartridge	tapeutil -f f.-o fmt [-w w][-v]
Query Device Type	tapeutil -f f.-o chk [-w w][-v]

Figure 311. Basic SCSI Commands and Syntax

Basic SCSI Commands	Syntax
Test unit Ready	tapeutil -f f.-o tur [-w w][-v]
Inquiry	tapeutil -f f.-o inq [-w w][-v]
Request Sense	tapeutil -f f.-o req [-w w][-v]
Reserved	tapeutil -f f.-o res [-w w][-v]
Reserved	tapeutil -f f.-o rel [-w w][-v]

Figure 312. Medium Changer Commands and Syntax

Medium Changer Commands	Syntax
Move Medium	tapeutil -f f.-o mov [-w w][-v] -s s -d d
Position To Element	tapeutil -f f.-o pos [-w w][-v] -s s
Element Information	tapeutil -f f.-o ele [-w w][-v]
Inventory	tapeutil -f f.-o inv [-w w][-v]
Audit	tapeutil -f f.-o aud [-w w][-v]
Lock/Unlock Door	tapeutil -f f.-o lck [-w w][-v] -x x



Figure 313. Tape Drive Commands and Syntax

Tape Drive Commands	Syntax
Read	tapeutil -f f.-o rea [-w w][ -v] -b b -n n -m m
Write	tapeutil -f f.-o wri [-w w][ -v] -b b -n n -m m [-r r] [-z z]
Write File Mark	tapeutil -f f.-o eof [-w w][ -v] -c c
Erase Tape	tapeutil -f f.-o era [-w w][ -v]
Rewind	tapeutil -f f.-o rew [-w w][ -v]
Retension	tapeutil -f f.-o ret [-w w][ -v]
Offline	tapeutil -f f.-o off [-w w][ -v]
Load/Unload Tape	tapeutil -f f.-o lod [-w w][ -v] -x x
Forward Space File	tapeutil -f f.-o fsf [-w w][ -v] -c c
Backward Space File	tapeutil -f f.-o bsf [-w w][ -v] -c c
Forward Space Record	tapeutil -f f.-o fsr [-w w][ -v] -c c
Backward Space Record	tapeutil -f f.-o bsr [-w w][ -v] -c c
Locate End of Data	tapeutil -f f.-o eod [-w w][ -v]
Get Record Size	tapeutil -f f.-o grs [-w w][ -v]
Set Record Size	tapeutil -f f.-o srs [-w w][ -v]
Get Device Status	tapeutil -f f.-o gds [-w w][ -v]
Get Device Information	tapeutil -f f.-o gdi [-w w][ -v]
Get Media Information	tapeutil -f f.-o gmi [-w w][ -v]
Get Position	tapeutil -f f.-o gpo [-w w][ -v] -t t
Set Position	tapeutil -f f.-o mov [-w w][ -v] -t t -x x
Get Parameter	tapeutil -f f.-o gpa [-w w][ -v] -t t
Set Parameter	tapeutil -f f.-o spa [-w w][ -v] -t t -x x
Sync Buffer	tapeutil -f f.-o syn [-w w][ -v]
Display Message	tapeutil -f f.-o msg [-w w][ -v] -t t -y y1,y1

**Note:** Invoking the *tapeutil* program with the **-h** flag (for example, **tapeutil -h**) or the **-?** flag (for example, **tapeutil -?**) will display the usage help information.

| The supported flags, their meanings, their associated operations, and their acceptable ranges are as follows:

| **Flag Description**

- | -? Usage Help (stand-alone flag) {no value required}
- | -b Block Size (rea, wri) {0 < (block size x blocking factor) <2097152}
- | -c Operation Count (eof, fsf, fsr, bsf, bsr) {0 - 65535}
- | -d Destination Address (mov) {device specific, determine range from Element Info}
- | -f Device Special File Name (always required) {/dev/rmt/1st or similar}
- | -h Usage Help (stand-alone flag) {no value required}
- | -m Multiples to Read or Write (rea, wri) {0 - 2097152}
- | -n Blocking Factor (rea, wri) {0 > (block size x blocking factor) <2097152}
- | -o Operation (always required) {refer to previous list}
- | -r Random Seed (wri) {0 - 65535}
- | -s Source Address (mov, pos) {device specific, determine range from Element Info}
- | -t Type of Parameter Value
  - | (gpo) {1=logical block, 2=physical block}
  - | (spo) {1=logical block, 2=physical block}
  - | (gpa) {1=block size, 2=compression, 3=buffering, 4=immediate, 5=trailer, 6=write protect, 7=acf mode, 8=capacity, 9=sili}
  - | (spa) {1=block size, 2=compression, 3=buffering, 4=immediate, 5=trailer, 6=write protect, 8=capacity, 9=sili}
  - | (msg) {1=display msg0, 2=display msg1, 3=flash msg0, 4=flash msg1, 5=alternate msg1/msg2}
- | -v Verbose Mode (optional for all commands, stand-alone flag) {no value required, absence of flag means quiet mode}
- | -w Open Mode (optional for all commands) {1=read/write, 2=read only (default), 3=write only, 4=append}
- | -x Parameter Value
  - | (lck) {1=lock, 2=unlock}
  - | (lod) {1=load, 2=unload}
  - | (srs) {0 - 65536}
  - | (spo) {0 - 65535}
  - | (spa) {0 - 65535}
- | -y Messages (msg) {message1,message2}
- | -z Input/Output File Name
  - | (sdp) {path and name of the file in which to store dump}
  - | (dmc) {path and name of the microcode image file}
  - | (wri) {path and name of the file containing write data pattern}

| **Notes:**

- | 1. For read and write operations, the size of one buffer of data transferred during a single SCSI read or write command is determined by the product of the *Block Size* value and the *B Factor* value. The number of these buffers transferred is determined by *Multiplier* value. The actual total number of bytes transferred is then (Block Size) x (Blocking Factor) x (Multiplier). If the device is set to fixed block mode (block size not equal to zero), the product of *Block Size* and *Blocking Factor* must be a multiple of the device block size setting.

- | 2. For further information on the Get Parameter (gpa) and Set Parameter (spa) operations, refer to the
- | STIOC\_GET\_PARM and STIOC\_SET\_PARM ioctl commands described in the *Programming*
- | *Reference*.

| The following examples should help to demonstrate and clarify the command-line usage of the *tapeutil*  
| program. For all examples, substitute the actual value of the special file associated with the target device.

| To query the serial number of the device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ st -o qsn -v
```

| To request inquiry data from the device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ st -o inq -v
```

| To move a cartridge from cell 32 to the tape drive (16):

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ smc -o mov -s 32 -d 16 -v
```

| To set the block size of the device to 64K:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ st -o spa -t 1 -x 65535 -v
```

| To write 100 64K blocks of data to the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ stn -w 1 -o wri -b 65535  
| -n 1 -m 1 -v
```

| To write two file marks to the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ stn -w 1 -o eof -c 2 -v
```

| To rewind the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ stn -o rew -v
```

| To read 100 64K blocks of data from the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ stn -o rea -b 65535 -n 1 -m  
| 1 -v
```

---

## TAPEUTIL in a HP-UX System Environment

### Introduction

A SCSI Tape and Medium Changer Utility Program called *tapeutil* is provided with the IBM SCSI Tape and Medium Changer Device Driver for HP-UX and installed in the */usr/bin* directory. The *tapeutil* program fulfills several purposes:

It provides the following service aids for IBM tape subsystems:

- Query Device Type/Verify Device Attachment
- Query Device Serial Number
- Query Device Microcode Level
- Force Device Diagnostic Dump
- Store Device Diagnostic Dump
- Download Device Microcode

It provides a menu-driven test tool for exercising or testing IBM tape and medium changer devices with a full suite of supported operations:

- Reading/Writing Data
- Tape Motion Commands
- Setting/Displaying Device Information/Status
- Mounting/Demounting Cartridges
- Cartridge Inventory

In addition to the menu-driven front end, the *tapeutil* program provides a command-line interface which is convenient for use in shell scripts.

The source code for the *tapeutil* program is provided for example purposes, and is installed in the *tapeutil* directory during the *tapeutil* package installation. This source code is commented and demonstrates calls to all of the supported device driver entry points and *ioctl* commands, thus giving the application developer a starting point for interfacing to the HP-UX device driver.

The *tapeutil* program provides both an interactive menu-driven interface as well as a command-line interface. If the *tapeutil* program is invoked with no command-line parameters, the menu-driven version will be started. In the menu-driven version, the device to be operated on should first be opened using option 1. Other options may then be selected. The user will be prompted for additional information if required for the specific options selected. The results of a command are displayed after it is executed. If an error occurs for the command, error information and device sense data are displayed. The device can be closed using option 2, or it will automatically be closed when the Quit option is selected. The menu is automatically displayed once when the program is first invoked. To prevent unnecessary scrolling of the screen, the menu is not automatically displayed again after each command, but is instead refreshed only after the M (menu refresh) command is entered.

### Interactive Menu-Driven Interface

Figure 314 on page APPENDA-10 shows the menu that is displayed by the *tapeutil* program when the program is invoked, and no command-line parameters are entered:

IBM SCSI TAPE & MEDIUM CHANGER UTILITY PROGRAM	
GENERAL COMMANDS	BASIC SCSI COMMANDS
1: Open Device	9: Test Unit Ready
2: Close Device	1 : Inquiry
D: Device Type	11: Request Sense
M: Menu Refresh	12: Reserve
Q: Quit Program	13: Release
SERVICE COMMANDS	MEDIUM CHANGER COMMANDS
3: Query Serial Number	14: Move Medium
4: Query Microcode Level	15: Position To Element
5: Force Dump	16: Element Information
6: Store Dump	17: Inventory
7: Download Microcode	18: Audit
8: Format Cartridge	19: Lock/Unlock Door
TAPE DRIVE COMMANDS	
2 : Read Data	32: Locate End Of Data
21: Write Data	33: Get Record Size
22: Write File Mark	34: Set Record Size
23: Erase Tape	35: Get Device Status
24: Rewind	36: Get Device Info
25: Retension	37: Get Media Info
26: Offline	38: Get Position
27: Load/Unload Tape	39: Set Position
28: Forward Space File	4 : Get Parameter
29: Backward Space File	41: Set Parameter
3 : Forward Space Record	42: Sync Buffer
31: Backward Space Record	43: Display Message

Figure 314. TAPEUTIL Program Menu

## Command-Line Mode

If command-line parameters are provided when the *tapeutil* program is invoked, the command-line mode will be started. For each command-line execution of the program, the device is first opened, the specific command is issued, and the device is then closed. The program can be driven from within a shell script if desired. Results of the operation will be displayed only when executed in verbose mode. No information is displayed when not in verbose mode. This is particularly useful for quiet shell script implementations. A completion code, as defined in */usr/include/sys/errno.h* for the operation requested is always returned from the program upon exit (in both verbose and quiet mode).

**Command-Line Commands and Syntax:** The usage of the *tapeutil* program in command-line mode is as follows:

```
tapeutil -f device -o
operation [options]
```

where **device** is the name of the tape device special file (for example: */dev/rmt/1m*) and **operation** is one of the values listed below. The device special file and the operation are required. The specific **options** associated with a particular operation are indicated in Figure 315, Figure 316, Figure 317 and Figure 318 on page APPENDA-12. Parameters enclosed in square brackets are optional. All others are required.

Figure 315. Service Commands and Syntax

Service Commands	Syntax
Query Serial Number	tapeutil -f f.-o qsn [-w w][-v]
Query Microcode Level	tapeutil -f f.-o qmc [-w w][-v]
Force Dump	tapeutil -f f.-o fdp [-w w][-v]
Store Dump	tapeutil -f f.-o sdp [-w w][-v] -z z
Download Microcode	tapeutil -f f.-o dmc [-w w][-v] -z z
Format Cartridge	tapeutil -f f.-o fmt [-w w][-v]
Query Device Type	tapeutil -f f.-o chk [-w w][-v]

Figure 316. Basic SCSI Commands and Syntax

Basic SCSI Commands	Syntax
Test unit Ready	tapeutil -f f.-o tur [-w w][-v]
Inquiry	tapeutil -f f.-o inq [-w w][-v]
Request Sense	tapeutil -f f.-o req [-w w][-v]
Reserved	tapeutil -f f.-o res [-w w][-v]
Reserved	tapeutil -f f.-o rel [-w w][-v]

Figure 317 (Page 1 of 2). Medium Changer Commands and Syntax

Medium Changer Commands	Syntax
Move Medium	tapeutil -f f.-o mov [-w w][-v] -s s -d d
Position To Element	tapeutil -f f.-o pos [-w w][-v] -s s
Element Information	tapeutil -f f.-o ele [-w w][-v]
Inventory	tapeutil -f f.-o inv [-w w][-v]

Figure 317 (Page 2 of 2). Medium Changer Commands and Syntax

Medium Changer Commands	Syntax
Audit	tapeutil -f f.-o aud [-w w][-v]
Lock/Unlock Door	tapeutil -f f.-o lck [-w w][-v] -x x

Figure 318. Tape Drive Commands and Syntax

Tape Drive Commands	Syntax
Read	tapeutil -f f.-o rea [-w w][-v] -b b -n n -m m
Write	tapeutil -f f.-o wri [-w w][-v] -b b -n n -m m [-r r] [-z z]
Write File Mark	tapeutil -f f.-o eof [-w w][-v] -c c
Erase Tape	tapeutil -f f.-o era [-w w][-v]
Rewind	tapeutil -f f.-o rew [-w w][-v]
Retension	tapeutil -f f.-o ret [-w w][-v]
Offline	tapeutil -f f.-o off [-w w][-v]
Load/Unload Tape	tapeutil -f f.-o lod [-w w][-v] -x x
Forward Space File	tapeutil -f f.-o fsf [-w w][-v] -c c
Backward Space File	tapeutil -f f.-o bsf [-w w][-v] -c c
Forward Space Record	tapeutil -f f.-o fsr [-w w][-v] -c c
Backward Space Record	tapeutil -f f.-o bsr [-w w][-v] -c c
Locate End of Data	tapeutil -f f.-o eod [-w w][-v]
Get Record Size	tapeutil -f f.-o grs [-w w][-v]
Set Record Size	tapeutil -f f.-o srs [-w w][-v]
Get Device Status	tapeutil -f f.-o gds [-w w][-v]
Get Device Information	tapeutil -f f.-o gdi [-w w][-v]
Get Media Information	tapeutil -f f.-o gmi [-w w][-v]
Get Position	tapeutil -f f.-o gpo [-w w][-v] -t t
Set Position	tapeutil -f f.-o spo [-w w][ -v] -t t -x x
Get Parameter	tapeutil -f f.-o gpa [-w w][ -v] -t t
Set Parameter	tapeutil -f f.-o spa [-w w][ -v] -t t -x x
Sync Buffer	tapeutil -f f.-o syn [-w w][ -v]
Display Message	tapeutil -f f.-o msg [-w w][ -v] -t t -y y1,y1

**Note:** Invoking the *tapeutil* program with the **-h** flag (for example, **tapeutil -h**) or the **-?** flag (for example, **tapeutil -?**) will display the usage help information.



**Flag Descriptions:** The supported flags, their meanings, their associated operations, and their acceptable ranges are as follows:

**Flag Description**

- | -? Usage Help (stand-alone flag) {no value required}
- | -b Block Size (rea, wri) {0 < (block size x blocking factor) <2097152}
- | -c Operation Count (eof, fsf, fsr, bsf, bsr) {0 - 65535}
- | -d Destination Address (mov) {device specific, determine range from Element Info}
- | -f Device Special File Name (always required) {/dev/rmt/1st or similar}
- | -h Usage Help (stand-alone flag) {no value required}
- | -m Multiples to Read or Write (rea, wri) {0 - 2097152}
- | -n Blocking Factor (rea, wri) {0 > (block size x blocking factor) <2097152}
- | -o Operation (always required) {refer to previous list}
- | -r Random Seed (wri) {0 - 65535}
- | -s Source Address (mov, pos) {device specific, determine range from Element Info}
- | -t Type of Parameter Value
  - | (gpo) {1=logical block, 2=physical block}
  - | (spo) {1=logical block, 2=physical block}
  - | (gpa) {1=block size, 2=compression, 3=buffering, 4=immediate, 5=trailer, 6=write protect, 7=acf mode, 8=capacity, 9=sili}
  - | (spa) {1=block size, 2=compression, 3=buffering, 4=immediate, 5=trailer, 6=write protect, 8=capacity, 9=sili}
  - | (msg) {1=display msg0, 2=display msg1, 3=flash msg0, 4=flash msg1, 5=alternate msg1/msg2}
- | -v Verbose Mode (optional for all commands, stand-alone flag) {no value required, absence of flag means quiet mode}
- | -w Open Mode (optional for all commands) {1=read/write, 2=read only (default), 3=write only, 4=append}
- | -x Parameter Value
  - | (lck) {1=lock, 2=unlock}
  - | (lod) {1=load, 2=unload}
  - | (spo) {0 - 65535}
  - | (spa) {0 - 65535}
- | -y Messages (msg) {message1,message2}
- | -z Input/Output File Name
  - | (sdp) {path and name of the file in which to store dump}
  - | (dmc) {path and name of the microcode image file}
  - | (wri) {path and name of the file containing write data pattern}

**Notes:**

1. For read and write operations, the size of one buffer of data transferred during a single SCSI read or write command is determined by the product of the *Block Size* value and the *B Factor* value. The number of these buffers transferred is determined by *Multiplier* value. The actual total number of bytes transferred is then (Block Size) x (Blocking Factor) x (Multiplier). If the device is set to fixed block mode (block size not equal to zero), the product of *Block Size* and *Blocking Factor* must be a multiple of the device block size setting.

| 2. For further information on the Get Parameter (gpa) and Set Parameter (spa) operations, refer to the  
| STIOC\_GET\_PARM and STIOC\_SET\_PARM ioctl commands described in the *Programming*  
| *Reference*.

| **Examples:** The following examples should help to demonstrate and clarify the command-line usage of  
| the *tapeutil* program. For all examples, substitute the actual value of the special file associated with the  
| target device.

| To query the serial number of the device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ m -o qsn -v
```

| To request inquiry data from the device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ m -o inq -v
```

| To move a cartridge from cell 32 to the tape drive (16):

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ smc -o mov -s 32 -d 16 -v
```

| To write 100 64K blocks of data to the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ mn -w 1 -o wri -b 65535  
| -n 1 -m 1 -v
```

| To write two file marks to the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ mn -w 1 -o eof -c 2 -v
```

| To rewind the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ mn -o rew -v
```

| To read 100 64K blocks of data from the tape device:

```
| /opt/IBMtape/tapeutil -f /dev/rmt/ mn -o rea -b 65535  
| -n 1 -m 1 -v
```

## TAPEUTIL in a Windows NT System Environment

**NT Utility Program:** The Magstar device is supported on Intel-based processors with a minimum processor level of Intel 486DX or Pentium with sufficient RAM and disk space for operation of the Microsoft Windows NT operating system.

The utility has these general characteristics:

1. Can be driven interactively or from a file (batch mode).
2. Allows specification of desired results from each step of the test so that the test can be self-checking.
3. Allows testing of all device driver interfaces with both valid and invalid parameters.

**Invoking NTUTIL:** The tool can be invoked as a command from the command line or from within a shell script:

```
ntutil <-f input-file> <-o output-file> <-d special-file> <-t>
```

The options are:

```
-f input-file      Specifies the input file for batch mode.
                  If a file is specified, NTUTIL will execute in
                  batch mode and read input from this file.
                  The default for this file is NTUTIL.in.

-o output-file     Specifies the output file.
                  The default for this file is NTUTIL.out.

-d special-file    Specifies the special file value
                  (for example, tape ) to substitute on the
                  "open" statement in the input file.

-t                Turns on internal tracing printouts in the
                  output file. Used only to debug the tool
                  itself.
```

**Notef** if no parameters are specified, NTUTIL will operate in interactive mode.

**Interactive Mode:** When NTUTIL is invoked without the *-f* flag, it defaults to running in interactive or manual mode. This mode allows a developer to interactively determine the kind of testing to be done. When in interactive mode, NTUTIL provides a menu of functions that can be performed.

For a description of interactive modes, see "Interactive Mode"

The two modes are:

- Base mode (LUN0) commands such as open/close/read/write
- Library mode (LUN0 and LUN1) that supports open/close/read/write plus media mover commands such as read element status and move media.

The Magstar 3590 must be in Random 2 LUN mode and the other Magstar devices must be in Random mode both when booted and to operate NTUTIL in library mode.

Base mode (only LUN 0 is accessed) is shown in Figure 319 on page APPENDA-16

Library mode (LUN 0 and LUN 1 are accessed) is shown in Figure 320 on page APPENDA-17

**Base Mode:** The Base Mode menu follows:

```
fd =-1 gp->fd1=-1 block size=1 24 block count=1
hex block id =
return_error_when_fail 1 exit_on_unexpected_result trace_flag
>

MANUAL TEST MENU:
+-----+
| 1: set device special file          2: display symbols |
| 3: set block size R/W (now ! fixed) 4: set block count (R/W)|
| 5: set return error when fail       6: set/reset trace   |
| 7: set exit on unexpected result     8: Library Mode     |
+-----+
| 2 : open                            21: close             |
| 22: read                             23: write             |
| 24: read and display block           25: flush (buffer->media)|
| 26: read block id                   27: erase             |
| 28: locate block id                 29: display block data |
+-----+
| 3 : write filemark(s)               31: rewind           |
| 32: forward space filemark(s)       33: unload           |
| 34: reverse space filemark(s)       35: load (359 Sys Mode)|
| 36: forward space record(s)         37: return error     |
| 38: reverse space record(s)         39: test unit ready  |
| 43: set media parms (block size)    44: set dev parms (comp. |
| 46: get device information           |
| 48: get medium information           49: inquiry          |
| 53: space EOD                       54: display message  |
+-----+
| 7 : system command                  |
+-----+
| 8 : Force Dump                      81: Read Dump       |
| 82: Update Code                     83: Log Sense       |
| 84: Get Last Sense                   85: Get Version     |
| 86: Associative/Persistent WProtect 87: Read/Write Test |
| 88: Find Devices                     89: Get MTDevice info |
+-----+
| 99: return to main menu              |
+-----+
enter selection:
```

Figure 319. Base Mode

**Library Mode:** The Library Mode menu follows:

```
fd =-1 gp->fd1=-1 block size=1 24 block count=1
hex block id =
return_error_when_fail 1 exit_on_unexpected_result trace_flag
>

MANUAL TEST MENU:
+-----+
| 1: set device special file          2: display symbols |
| 3: set block size R/W (now ! fixed) 4: set block count (R/W)|
| 5: set return error when fail       6: set/reset trace   |
| 7: set exit on unexpected result     8: Base Mode       |
+-----+
| 1 : ioctl return library inventory   11: ioctl move medium |
| 12: ioctl initialize element status  |
+-----+
| 2 : open                            21: close           |
| 22: read                             23: write          |
| 24: read and display block           25: flush (buffer->media)|
| 26: read block id                   27: erase         |
| 28: locate block id                 29: display block data |
+-----+
| 3 : write filemark(s)               31: rewind        |
| 32: forward space filemark(s)       33: unload        |
| 34: reverse space filemark(s)       35: load (359 Sys Mode) |
| 36: forward space record(s)         37: return error  |
| 38: reverse space record(s)         39: test unit ready |
| 43: set media parms (block size)    44: set dev parms (comp.)|
| 46: get device information           |
| 48: get medium information           49: inquiry      |
| 53: space EOD                       54: display message |
+-----+
| 7 : system command                  |
+-----+
| 8 : Force Dump                      81: Read Dump    |
| 82: Update Code                     83: Log Sense    |
| 84: Get Last Sense                  85: Get Version  |
| 86: Associative/Persistent WProtect 87: Read/Write Test |
| 88: Find Devices                    89: Get MTDevice info |
+-----+
| 99: return to main menu              |
+-----+
enter selection:
```

Figure 320. Library Mode



# Parts Catalog

## How to Use This Parts Catalog

**SIMILAR ASSEMBLIES:** If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.

**AR: (As Required)** in the Units column indicates the quantity of the part is used as required.

**NP: (Non-Procurable)** in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.

**NR: (Not Recommended)** in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.

**R: (Restricted)** in the Units column indicates the part has a restricted availability.

**INDENTURE:** The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

<b>Indenture</b>	<b>Relationship of Parts</b>
<b>(No dots)</b>	MAIN ASSEMBLY
<b>(One dot)</b>	Detail parts of a main assembly
<b>(One dot)</b>	Subassembly of the main assembly
<b>(Two dots)</b>	Detail part of a one-dot subassembly
<b>(Two dots)</b>	Subassembly of a one-dot subassembly
<b>(Three dots)</b>	Detail part of a two-dot subassembly

## Assembly *n*: Cover Assembly

Asm- Index	Part Number	Units	Description
<i>n</i> -	2512667	1	Cover Assembly, Rear, Red
-	2512668	1	Cover Assembly, Rear, Yellow
-	2512669	1	Cover Assembly, Rear, Blue
-	2512670	1	Cover Assembly, Rear, Gray
-	2513714	1	Cover Assembly, Rear, White
For Next Higher Assembly, See 1-2 on page 15			

**Assembly n: (continued)**

<b>Asm- Index</b>	<b>Part Number</b>	<b>Units</b>	<b>Description</b>
n-1	5373637	1	Seal, Top
-2	5356429	2	Clip, Retaining
-3	2513013	3	Liner, Cover
-4	5373727	1	Seal, Left Side
-5	5356429	3	Clip, Retaining
-6	513668	2	Catch,Cover
-7	81693	4	Screw, Mach Bind Hd- 6-32, X 0.375 Long
-8	1847630	R	Finger Stock Assembly
-9	1847602	NR	Channel, Finger Stock
-10	1847604	NR	Finger Stock, 2.00 Long
-11	5373639	AR	Seal, Bottom
-12	5356429	2	Clip, Retaining
-13		NP	Cover, Rear, without Paint

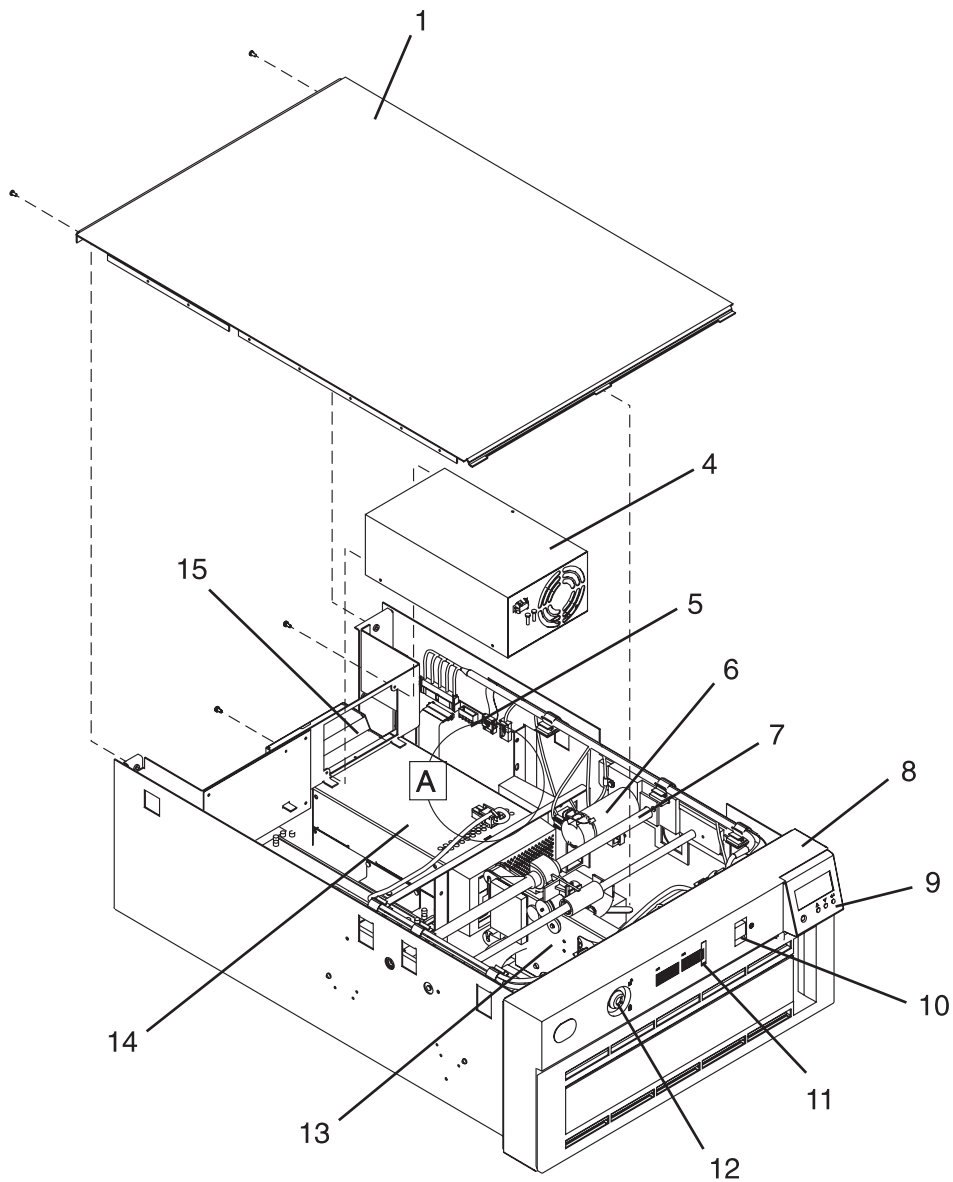
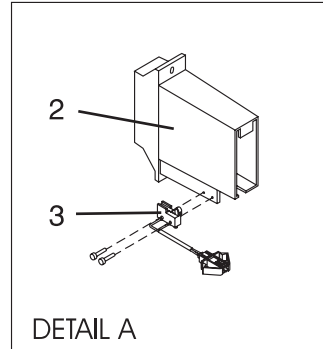


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## Assemblies List

Base Drive All Models . . . . .	PARTS-8
Desktop Drive Model-B00 . . . . .	PARTS-6
Desktop Library Assembly, Model-B01 . . . . .	PARTS-10
Desktop Library Assembly, Model-B02 . . . . .	PARTS-16
Rackmount Library Assembly, Model B21 . . . . .	PARTS-20
Rackmount Library Assembly, Model-B11 . . . . .	PARTS-4
Rackmount Library Assembly, Model-B12 . . . . .	PARTS-14

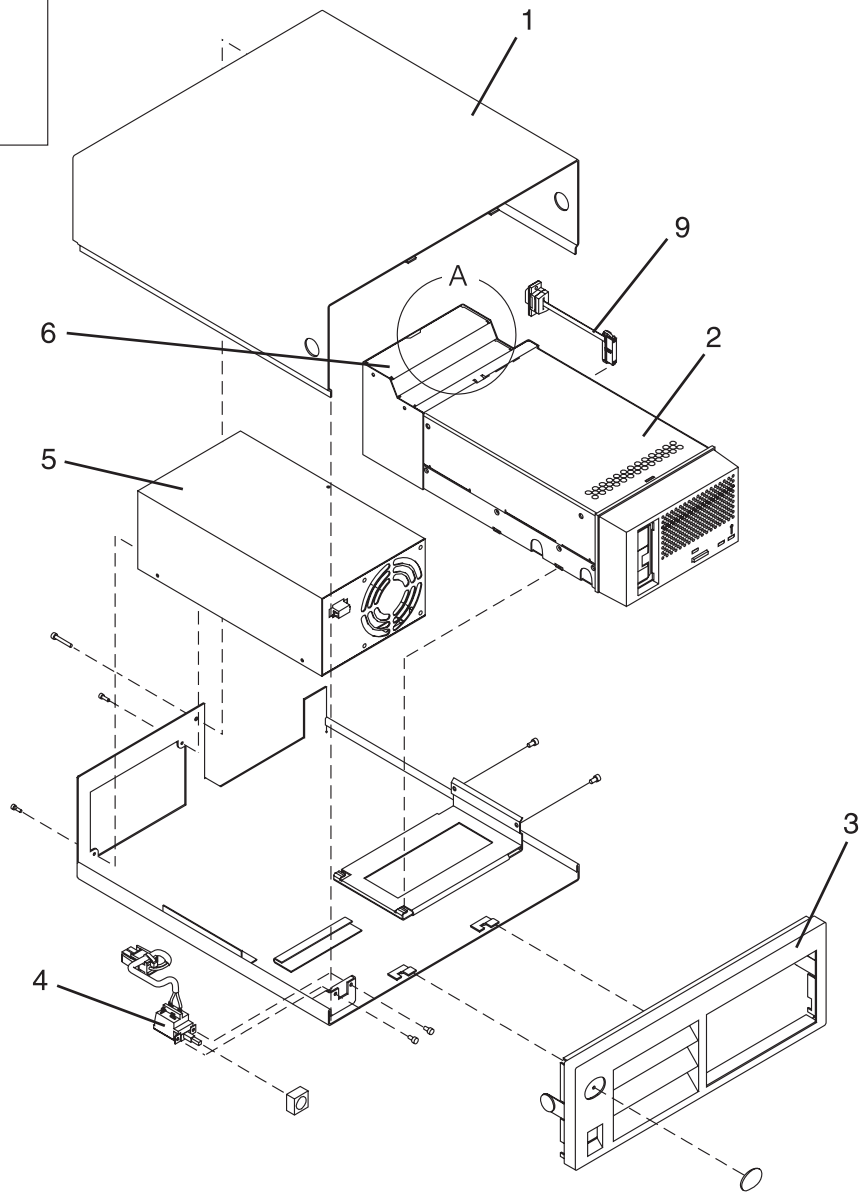
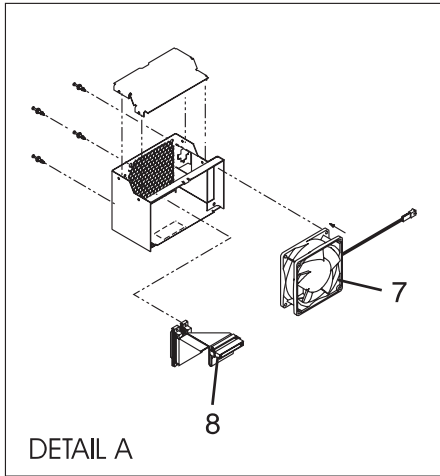
# Assembly 1: Rackmount Library Assembly, Model-B11



A2180001

Asm- Index	Part Number	Units	Description
1-0	0	NP	Rackmount Library Assembly, Model-B11
-1	0	1	Cover, Top (no color)
-1	08L6519	1	(Not Shown) Hardware FRU Pack Hardware FRU pack contains various spare screws and nuts.
-2	0	1	Cleaner Cartridge Storage
-2	05H2912	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	50G0322	1	Power Supply
-5	05H9386	1	Library Control Card If you are replacing the library control card in a model B01 or B11 and the microcode installed in the tape drive is link 2_85A, 2_87F or 2_903, the microcode must be updated to a later level, (for example 3_xxx). If attached to a RS/6000 System, order FMR Diskette P/N 05H9510. If attached to AS/400, order FMR Tape Cartridge P/N 05H9506. If the Bar Code Reader feature is installed on the library and you are replacing the library control card, remove the bar code reader card from the old card and install it on the new card.
-5	05H9449	1	Bar Code Reader (kit contains reader & card)
-6	34G7550	1	Accessor Motor Assembly
-7	34G7539	1	Accessor Assembly
-8	49G6645	1	Front Assembly, Pearl White The following sensors are not shown but are listed for reference.
-8	45G0277	1	Magazine 1 Sensor
-8	45G0277	1	Magazine 2 Sensor
-8	45G0277	1	Priority Cell-Cartridge Present Sensor
-8		1	Library Door Open Sensor (Replace Front Panel)
-8	05H4595	1	Drive Global Sensor Pair
-8	05H4595	1	Magazine Global Sensor Pair
-9	62G0673	1	Library Operator Panel Display
-9	34G7563	1	Cover, Operator Panel (Pearl White)
-10	65F5411	1	AC Switch and Cable Assembly
-11	09G8933	1	Library LED Card
-12	0	1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-13	34G7571	1	Picker Assembly If the Bar Code Reader feature is installed on the library and you are replacing the picker assembly, remove the bar code reader from the old picker assembly and install it on the new one.
-13	05H9449	1	Bar Code Reader (kit contains card and reader)
-13	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-13	65F5403	1	Library Operator Panel Display Cable
-13	65F5398	1	Library Interface Cable
-13	05H4539	1	Library Sensor Cable
-14	0	NP	Drive Pack Assembly Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-15		NP	Cooling Pack Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.

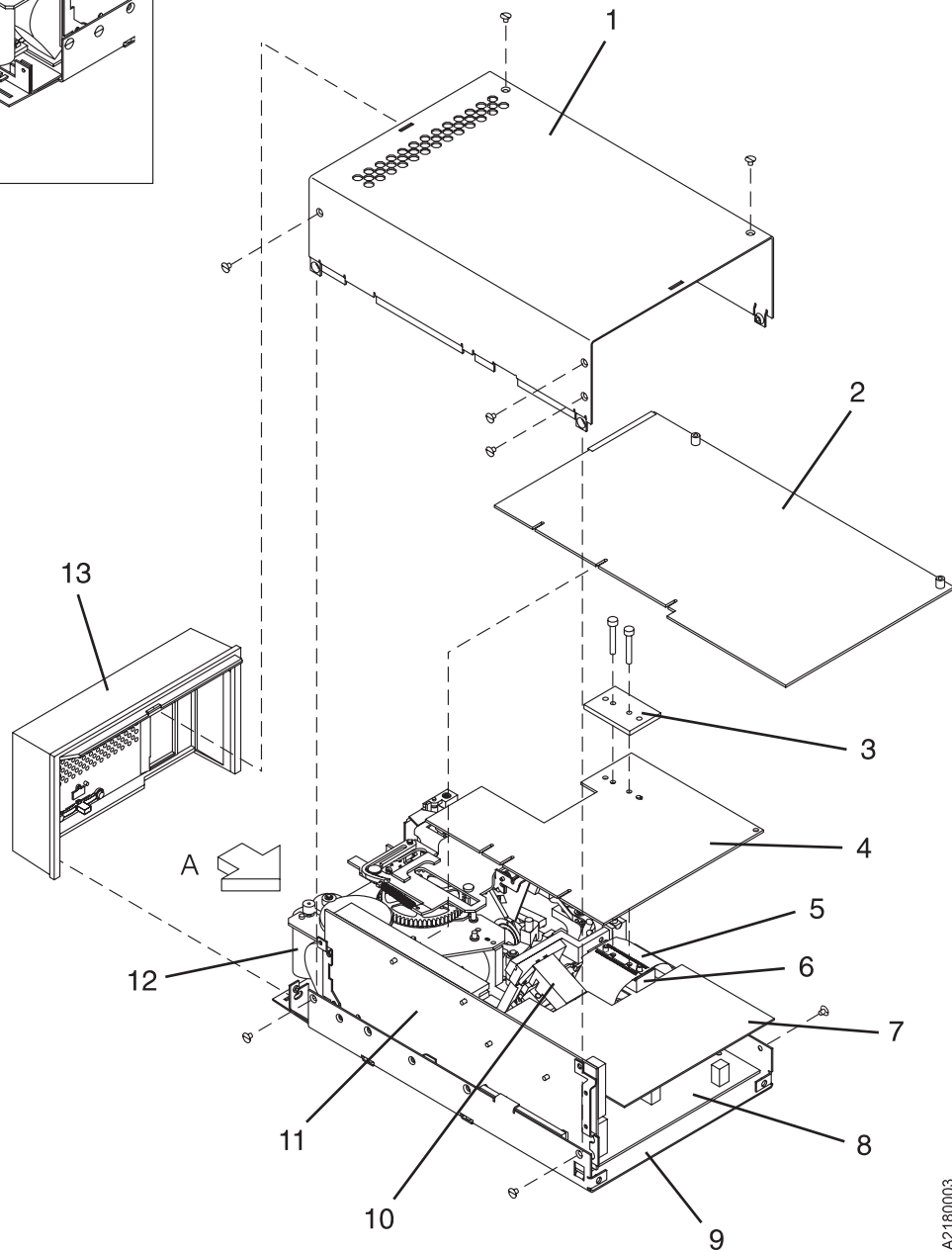
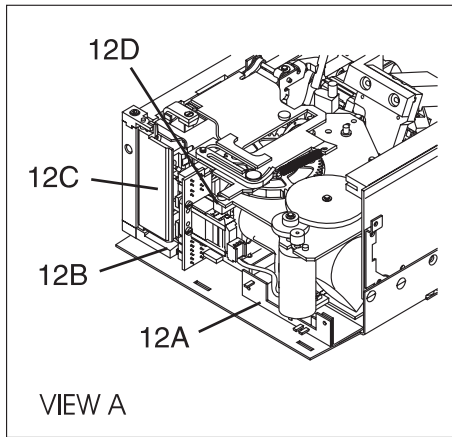
## Assembly 2: Desktop Drive Model-B00



A2180002

Asm- Index	Part Number	Units	Description
2-0	0	NP	Desktop Drive Model-B00
-1	34G7753	1	Cover, Top
-1	08L6519	1	(Not Shown) Hardware FRU Pack Hardware FRU pack contains various spare screws and nuts.
-2	0	1	Drive Pack Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-3	34G7752	1	Front External Drive Bezel
-4	65F5410	1	Power On/Off Switch Assembly
-5	50G0322	1	Power Supply
-6	0	1	Fan/SCSI Assembly
-7	34G7609	1	Drive Cooling Fan
-8	65F5409	1	Internal SCSI Cable
-9	65F5397	1	RS-422 Cable-Internal to Drive (Not used by Model B00. This cable is not present on some drives.)

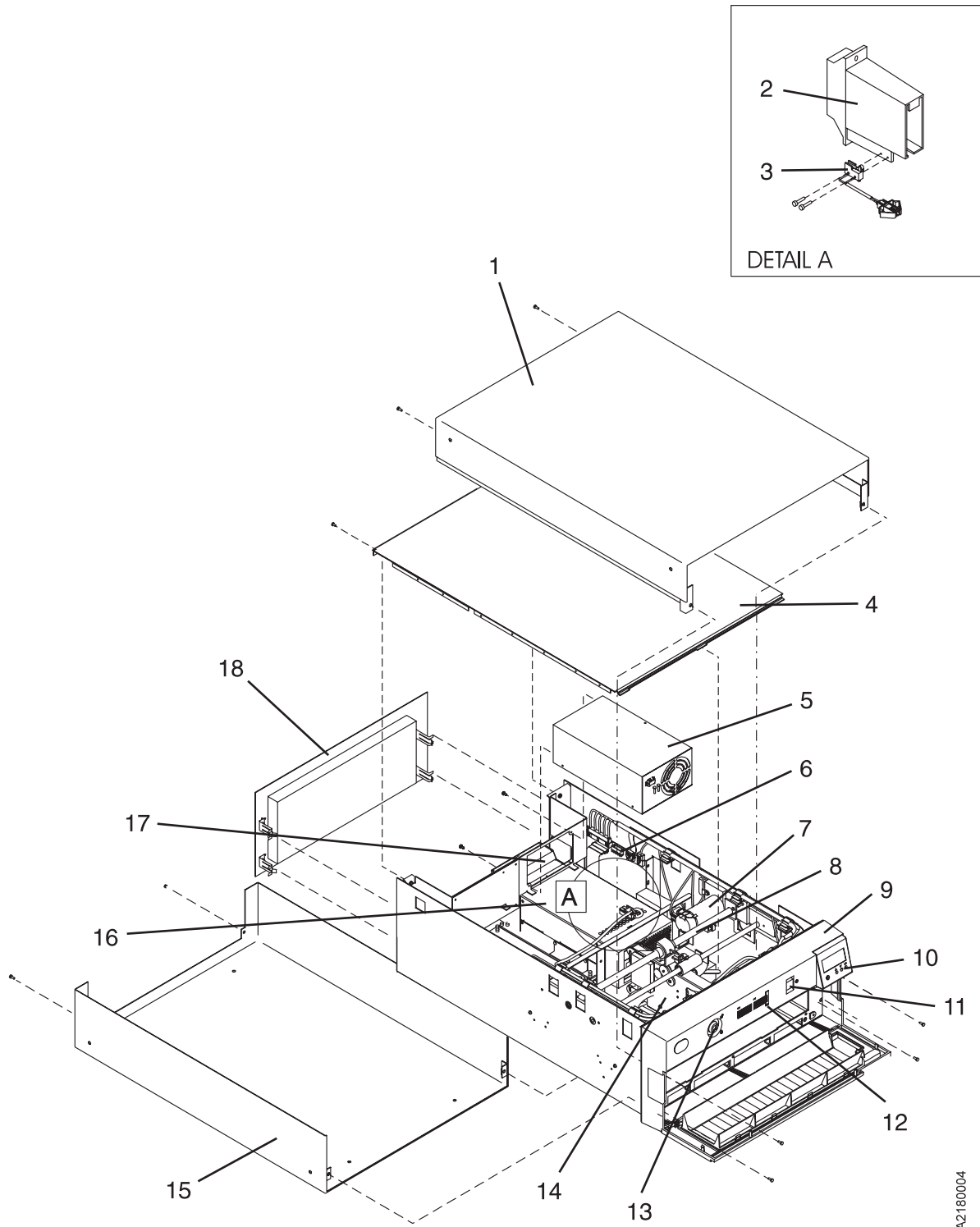
# Assembly 3: Base Drive All Models



A2180003

Asm- Index	Part Number	Units	Description
3-	0	NP	Base Drive All Models
-1		1	Cover, Drive Top
-1	08L6519	1	(Not Shown) Hardware FRU Pack Hardware FRU pack contains various spare screws and nuts.
-2	05H7844	1	Drive Logic Card
-3	0	1	Retainer
-4	05H4546	1	Drive Analog Card
-5	0	1	Thin Film Head Cable
-6	0	1	Cable Mounting Block
-7	0	1	Shield
-8	05H9381	1	Drive Servo Card
-9	0	1	Bottom Plate
-10	34G7710	1	Head-Actuator AssemblyW/Brush
-11	49G6634	1	Mother Board
-12	34G7611	1	Loader Assembly
-12A	34G7690	1	Drive LED Card
-12B	45G0277	1	Door Open Sensor (late machines)
-12C	34G7705	1	Loader Door
-12D	45G0277	1	Loader Home Sensor
-12	65F5400	1	Cable, Drive Sensor (not shown)
-13	34G7728	1	Front Internal Drive Bezel

# Assembly 4: Desktop Library Assembly, Model-B01



A2180004



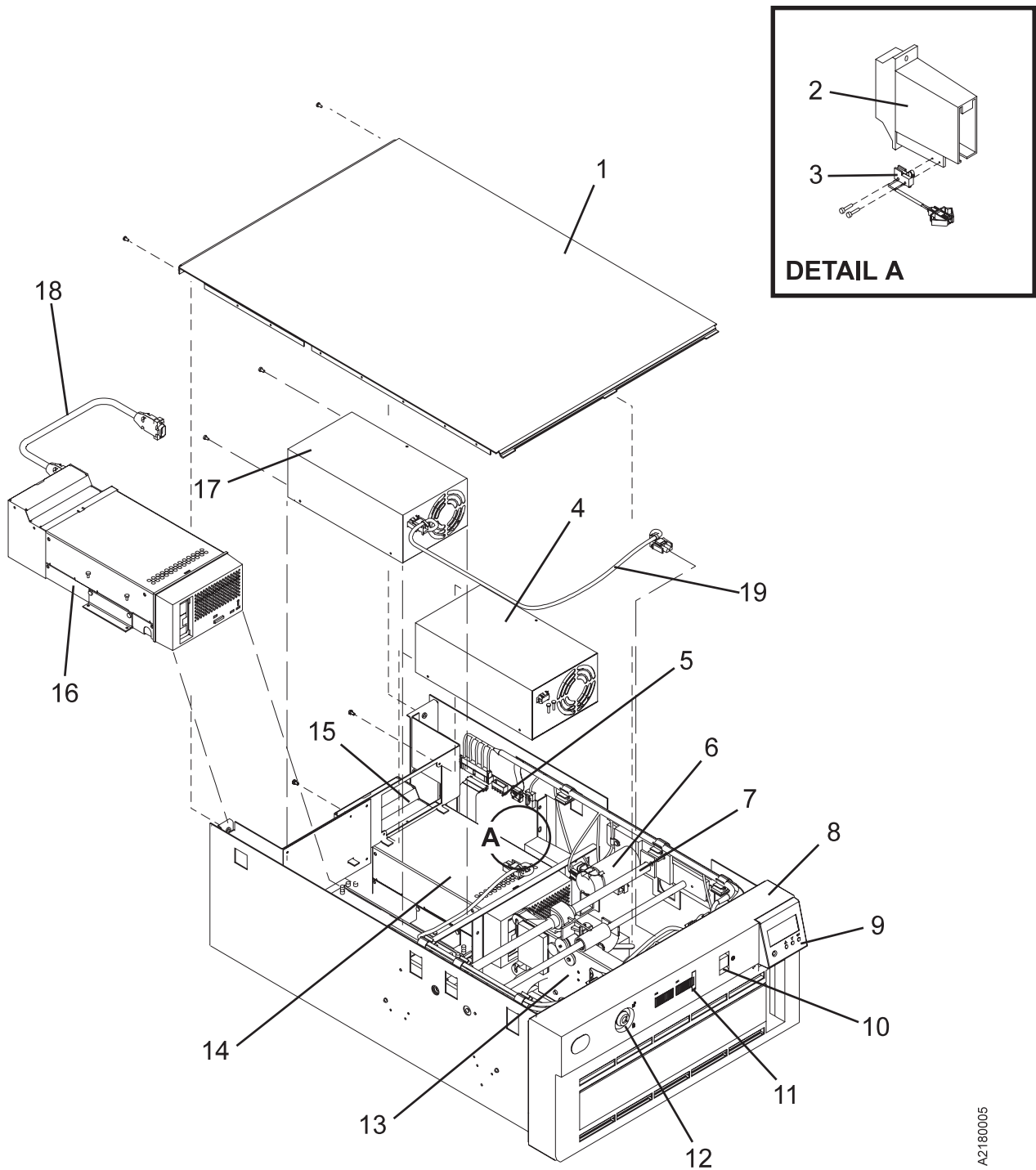
Asm- Index	Part Number	Units	Description
4-0	0	NP	Desktop Library Assembly, Model-B01
-1	34G7736	1	Top Cover-Pearl White
-1	08L6519	1	(Not Shown) Hardware FRU Pack Hardware FRU pack contains various spare screws and nuts.
-1	34G7791	1	Top Cover-Raven Black
-2	0	1	Cleaner Cartridge Storage
-2	05H9212	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	0	1	Cover, Top (no color)
-5	50G0322	1	Power Supply
-6	05H9386	1	Library Control Card If you are replacing the library control card in a model B01 or B11 and the microcode installed in the tape drive is link 2_85A, 2_87F or 2_903, the microcode must be updated to a later level, (for example 3_xxx). If attached to a RS/6000 System, order FMR Diskette P/N 05H9510. If attached to AS/400, order FMR Tape Cartridge P/N 05H9506. If the Bar Code Reader feature is installed on the library and you are replacing the library control card with a new one, remove the Bar Code Reader card from the old library control card and install it on the new card.
-6	05H9449	1	Bar Code Reader (kit contains reader and card)
-7	34G7550	1	Accessor Motor Assembly
-8	34G7539	1	Accessor Assembly
-9	49G6645	1	Front Assembly, Pearl White
-9	05H4547	1	Front Assembly, Raven Black The following sensors are not shown but are listed for reference.
-9	45G0277	1	Magazine 1 Sensor
-9	45G0277	1	Magazine 2 Sensor
-9	45G0277	1	Priority Cell-Cartridge Present Sensor
-9	45G0277	1	Library Door Open Sensor
-9	05H4595	1	Drive Global Sensor Pair
-9	05H4595	1	Magazine Global Sensor Pair
-10	62G0673	1	Library Operator Panel Display
-10	34G7563	1	Cover, Operator Panel - Pearl White
-10	34G7801	1	Cover, Operator Panel - Raven Black
-11	65F5411	1	AC Switch and Cable Assembly
-12	09G8933	1	Library LED Card
-13	0	1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-14	34G7571	1	Picker Assembly If the Bar Code Reader feature is installed on the library and you are replacing the picker assembly with a new one, remove the Bar Code Reader from the old picker assembly and install it on the new one.
-14	05H9449	1	Bar Code Reader (kit contains reader and card)
-14	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-14	65F5398	1	Library Interface Cable
-14	65F5403	1	Library Operator Panel Display Cable
-14	05H4539	1	Library Sensor Cable
-15	34G7526	1	Bottom Cover-Pearl White
-15	34G7789	1	Bottom Cover-Raven Black
-16	0	NP	Drive Pack Assembly Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-17	0	NP	Fan/SCSI Assembly Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.

**Assembly 4: (continued)**

-18	34G7557	1	Acoustic Cover Assembly
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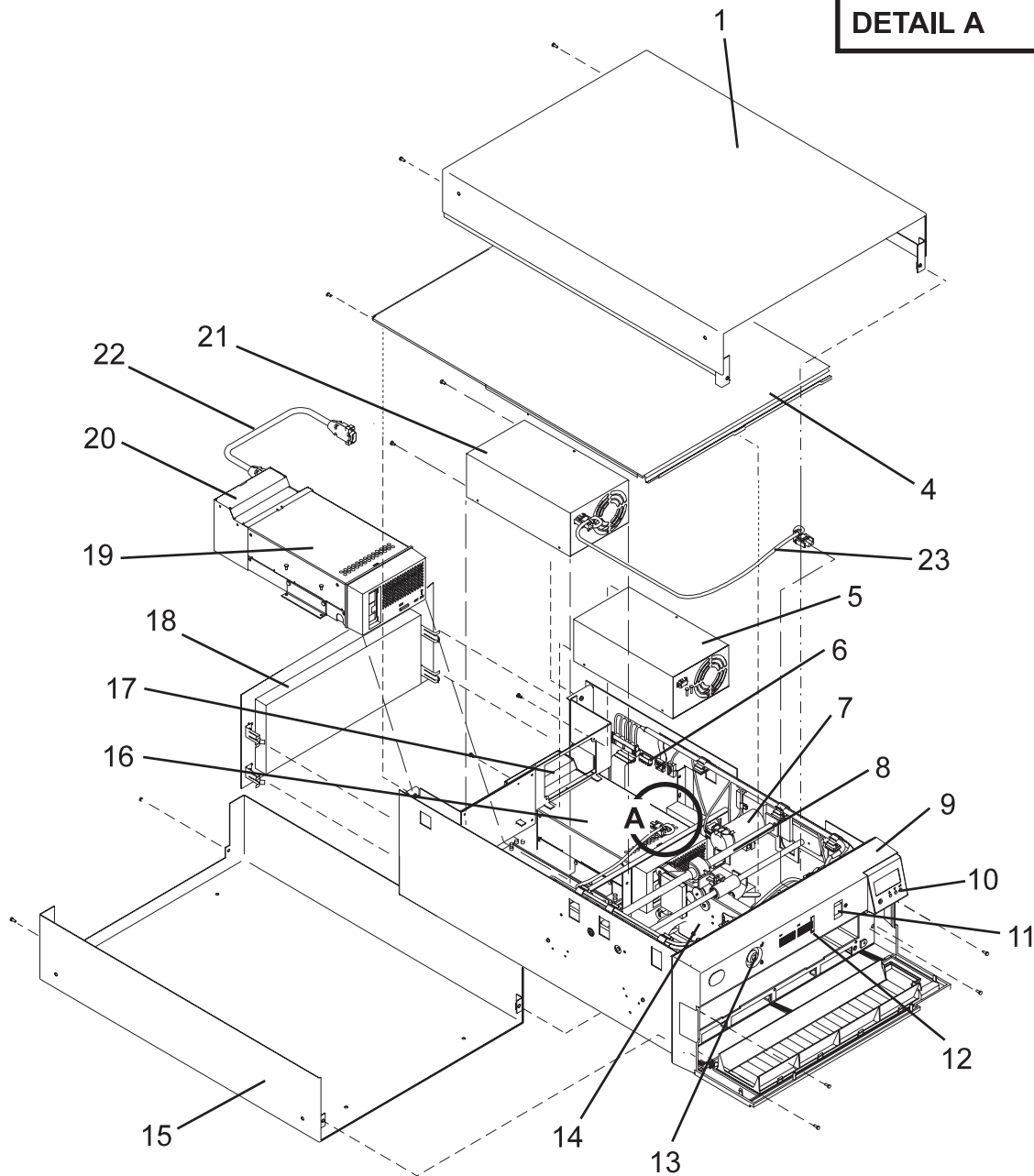
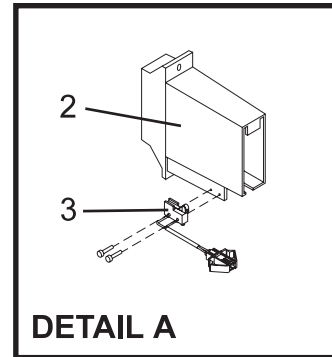
# Assembly 5: Rackmount Library Assembly, Model-B12



A2180005

Asm-Index	Part Number	Units	Description
5-0	0	NP	Rackmount Library Assembly, Model-B12
-1	0	1	Cover, Top (no color)
-2	0	1	Cleaner Cartridge Storage
-2	05H9212	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	50G0322	1	Power Supply Power supply for Drive 1
-5	05H9386	1	Library Control Card If the Bar Code Reader feature is installed on the library and you are replacing the library control card, remove the Bar Code Reader card from the old card and install it on the new card.
-5	05H9449	1	Bar Code Reader (kit contains reader and card)
-6	34G7550	1	Accessor Motor Assembly
-7	34G7539	1	Accessor Assembly
-8	49G6645	1	Front Assembly, Pearl White The following sensors are not shown but are listed for reference.
-8	45G0277	1	Magazine 1 Sensor
-8	45G0277	1	Magazine 2 Sensor
-8	45G0277	1	Priority Cell-Cartridge Present Sensor
-8	45G0277	1	Library Door Open Sensor
-8	05H4595	1	Drive Global Sensor Pair
-8	05H4595	1	Magazine Global Sensor Pair
-9	62G0673	1	Library Operator Panel Display
-9	34G7563	1	Cover, Operator Panel (Pearl White)
-10	65F5411	1	AC Switch and Cable Assembly
-11	09G8933	1	Library LED Card
-12	0	1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-13	34G7571	1	Picker Assembly If the Bar Code Reader feature is installed on the library and you are replacing the picker assembly, remove the Bar Code Reader from the old picker assembly and install it on the new one.
-13	05H9449	1	Bar Code Reader (kit contains reader and card)
-13	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-13	65F5403	1	Library Operator Panel Display Cable
-13	65F5398	1	Library Interface Cable
-13	05H4539	1	Library Sensor Cable
-14	0	NP	Drive Pack Assembly (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-15	0	NP	Cooling Pack (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.
-16	0	NP	Drive Pack Assembly (Drive 2) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-17	50G0322	1	Power Supply Power supply for Drive 2
-18	65F5399	1	RS-422 Cable, DU0 to DU1. Shown attached to rear of Drive 2.
-18	65F5397	1	RS-422 Cable Internal to Drive. Drive 2 only and not shown.
-19	65F5406	1	AC Cable to power supply 2.

# Assembly 6: Desktop Library Assembly, Model-B02



A2180006

Asm-Index	Part Number	Units	Description
6-0	0	NP	Desktop Library Assembly, Model-B02
-1	34G7736	1	Top Cover-Pearl White
-1	34G7791	1	Top Cover-Raven Black
-2	0	1	Cleaner Cartridge Storage
-2	05H2912	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	0	1	Cover, Top (no color)
-5	50G0322	1	Power Supply (Power Supply for Drive 1)
-6	05H9386	1	Library Control Card If the Bar Code Reader feature is installed on the library and you are replacing the library control card, remove the bar code reader card from the old card and install it on the new card.
-6	05H9449	1	Bar Code Reader (kit contains reader and card)
-7	34G7550	1	Accessor Motor Assembly
-8	34G7539	1	Accessor Assembly
-9	49G6645	1	Front Assembly, Pearl White
-9	05H4547	1	Front Assembly, Raven Black The following sensors are not shown but are listed for reference.
-9	45G0277	1	Magazine 1 Sensor
-9	45G0277	1	Magazine 2 Sensor
-9	45G0277	1	Priority Cell-Cartridge Present Sensor
-9	45G0277	1	Library Door Open Sensor
-9	05H4595	1	Drive Global Sensor Pair
-9	05H4595	1	Magazine Global Sensor Pair
-10	62G0673	1	Library Operator Panel Display
-10	34G7563	1	Cover, Operator Panel - Pearl White
-10	34G7801	1	Cover, Operator Panel - Raven Black
-11	65F5411	1	AC Switch and Cable Assembly
-12	09G8933	1	Library LED Card
-13	0	1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-14	34G7571	1	Picker Assembly If the Bar Code Reader feature is installed on the library and you are replacing the picker assembly, remove the bar code reader from the old picker assembly and install it on the new one.
-14	05H9449	1	Bar Code Reader (kit contains reader and card)
-14	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-14	65F5398	1	Library Interface Cable
-14	65F5403	1	Library Operator Panel Display Cable
-14	05H4539	1	Library Sensor Cable
-15	34G7526	1	Bottom Cover-Pearl White
-15	34G7789	1	Bottom Cover-Raven Black
-16	0	NP	Drive Pack Assembly (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-17	0	NP	Fan/SCSI Assembly (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.
-18	34G7557	1	Acoustic Cover Assembly
-19	0	NP	Drive Pack Assembly (Drive 2) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-20	0	NP	Fan/SCSI Assembly (Drive 2) Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.
-21	50G0322	1	Power Supply (Power supply for Drive 2).

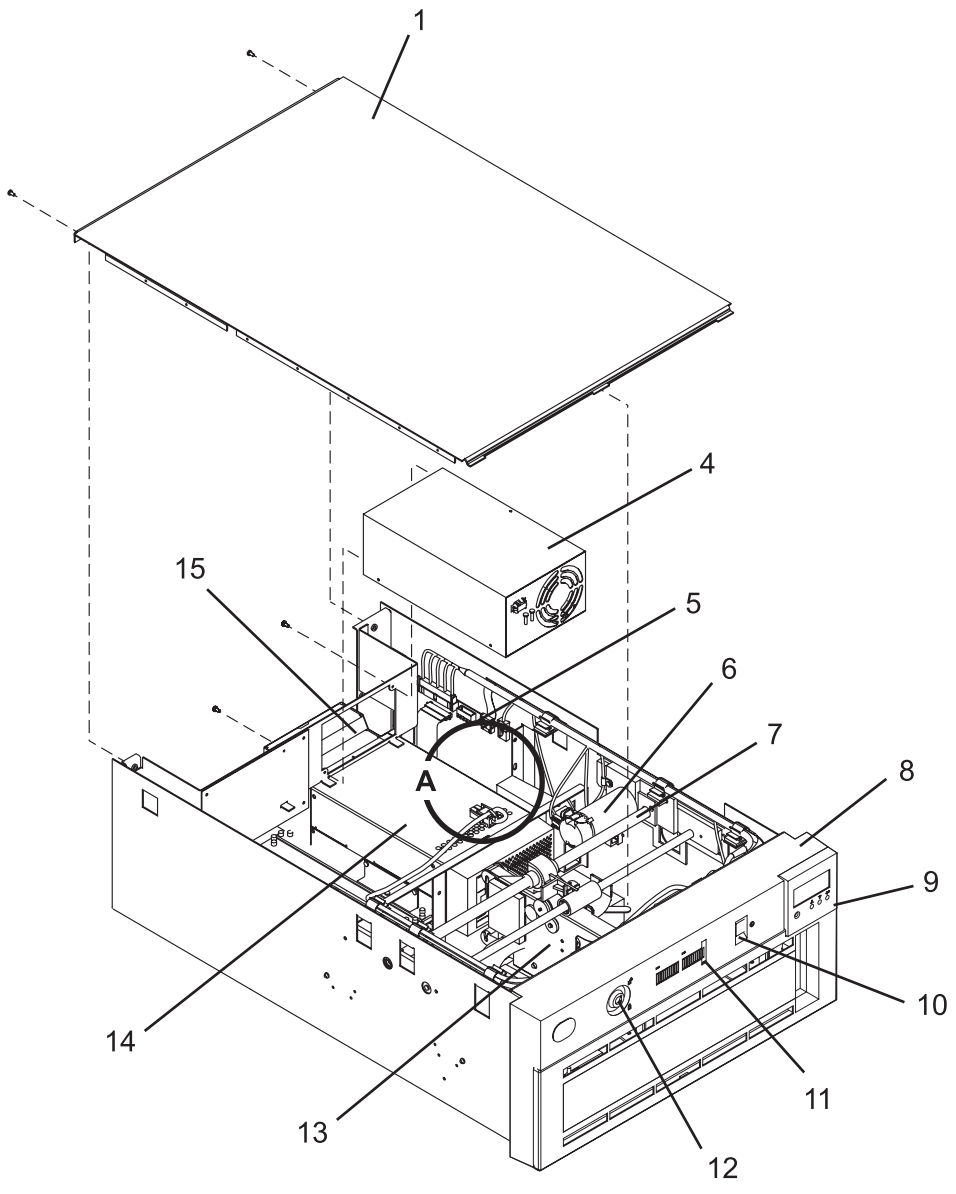
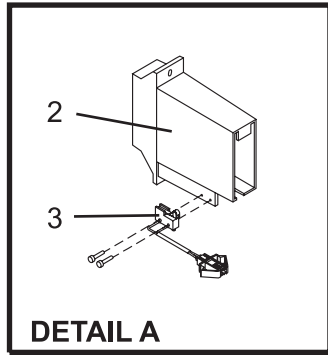
**Assembly 6: (continued)**

-22	65F5399	1	RS-422 Cable, DU0-DU1. Shown attached to rear of Drive 2
-22	65F5397	1	RS-422 Cable, Internal to Drive. Drive 2 only and not shown.
-23	65F5406	1	AC Cable to power supply 2.





# Assembly 7: Rackmount Library Assembly, Model B21

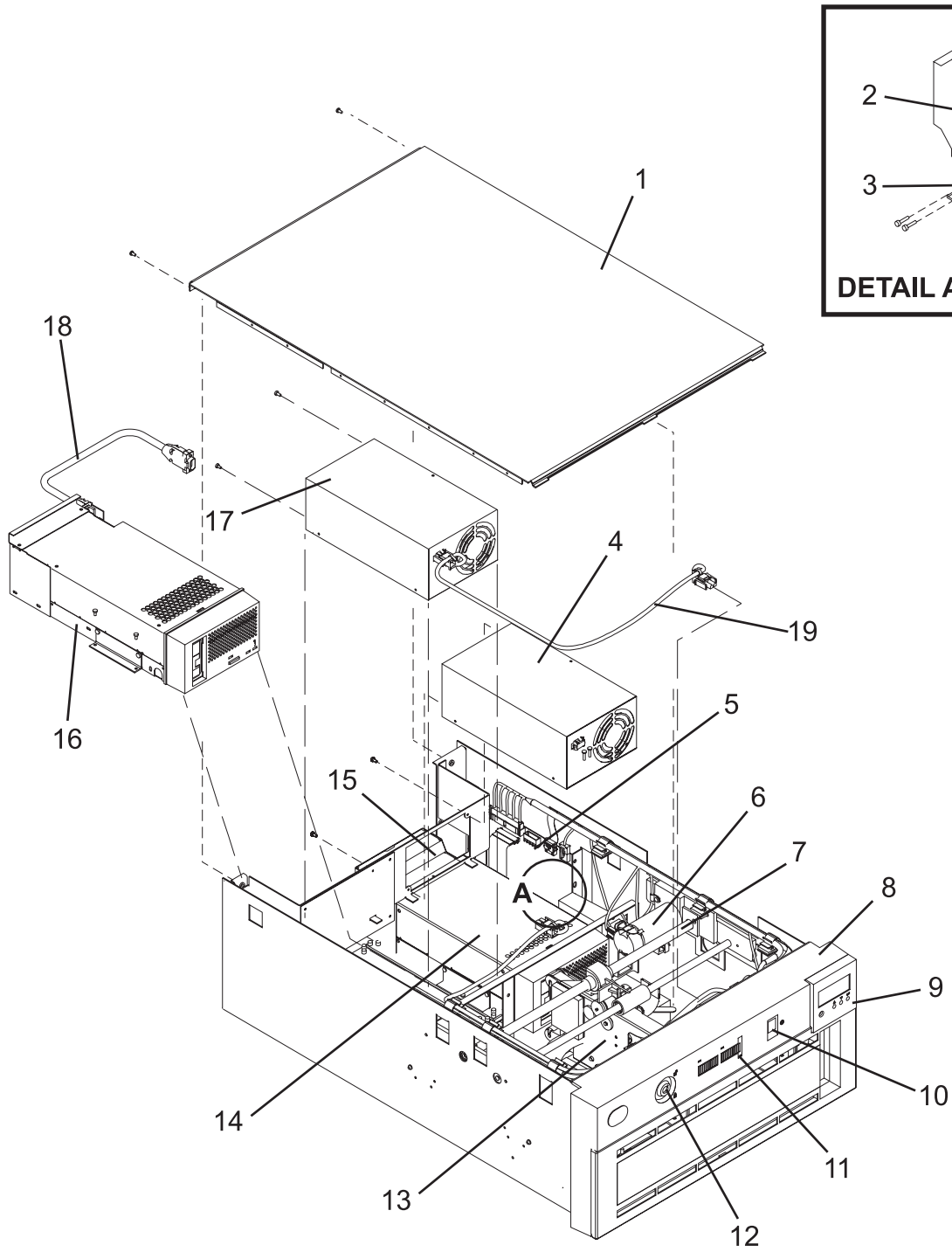


A2180007

Asm- Index	Part Number	Units	Description
7-1	0	NP	Rackmount Library Assembly, Model B21
-1	0	1	Cover, Top (no color)
-2	0	1	Cleaner Cartridge Storage
-2	05H2912	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	50G0322	1	Power Supply
-5	05H9386	1	Library Control Card Remove the bar code reader card from the old card and install it on the new card.
-5	05H9449	1	Bar Code Reader (kit contains reader & card)
-6	34G7550	1	Accessor Motor Assembly
-7	34G7539	1	Accessor Assembly
-8	08L6481	1	Front Assembly, Raven Black The following sensors are not shown but are listed for reference.
-8	45G0277	1	Magazine 1 Sensor
-8	45G0277	1	Magazine 2 Sensor
-8	45G0277	1	Priority Cell-Cartridge Present Sensor
-8		1	Library Door Open Sensor (replace front assembly)
-8	05H4595	1	Drive Global Sensor Pair
-8	05H4595	1	Magazine Global Sensor Pair
-9	62G0673	1	Library Operator Panel Display
-9	34G7801	1	Cover, Operator Panel, Raven Black
-10	65F5411	1	AC Switch and Cable Assembly
-11	09G8933	1	Library LED Card
-12		1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-13	34G7571	1	Picker Assembly Remove the bar code reader from the old picker assembly and install it on the new one.
-13	05H9449	1	Bar Code Reader (kit contains card and reader)
-13	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-13	65F5403	1	Library Operator Panel Display Cable
-13	65F5398	1	Library Interface/RS-422 Cable
-13	05H4539	1	Library Sensor Cable
-14	0	NP	Drive Pack Assembly Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-15	0	NP	Cooling Pack Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6. See Figure 220 on page INST-32 for a detailed listing of the rack mounting hardware.

# Assembly 8

Rackmount Library Assembly, Model B22



A218C005

Asm- Index	Part Number	Units	Description
8-1	0	NP	Rackmount Library Assembly, Model B22
-1	0	1	Cover, Top (no color)
-2	0	1	Cleaner Cartridge Storage
-2	05H2912	1	Cleaner Cartridge Retention Spring (not shown)
-3	65F5407	1	Micro Switch, Cleaner Cartridge-Present Sensor
-4	50G0322	1	Power Supply Power supply for Drive 1
-5	05H9386	1	Library Control Card Remove the Bar Code Reader card from the old card and install it on the new card.
-5	05H9449	1	Bar Code Reader (kit contains reader and card)
-6	34G7550	1	Accessor Motor Assembly
-7	34G7539	1	Accessor Assembly
-8	08L6481	1	Front Assembly, Raven Black The following sensors are not shown but are listed for reference.
-8	45G0277	1	Magazine 1 Sensor
-8	45G0277	1	Magazine 2 Sensor
-8	45G0277	1	Priority Cell-Cartridge Present Sensor
-8	0	1	Library Door Open Sensor (replace front assembly)
-8	05H4595	1	Drive Global Sensor Pair
-8	05H4595	1	Magazine Global Sensor Pair
-9	62G0673	1	Library Operator Panel Display
-9	34G7801	1	Cover, Operator Panel, Raven Black
-10	65F5411	1	AC Switch and Cable Assembly
-11	09G8933	1	Library LED Card
-12		1	Key, Lock Assembly Not a FRU. Part of Front Assembly.
-13	34G7571	1	Picker Assembly Remove the Bar Code Reader from the old picker assembly and install it on the new one.
-13	05H9449	1	Bar Code Reader (kit contains reader and card)
-13	65F5402	1	Picker Cable The following cables are not shown but are listed for reference.
-13	65F5403	1	Library Operator Panel Display Cable
-13	65F5398	1	Library Interface/RS-422 Cable (Drive 1)
-13	05H4539	1	Library Sensor Cable
-14	0	NP	Drive Pack Assembly (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-15		NP	Cooling Pack (Drive 1) Not a FRU. For detailed breakdown, see "Assembly 2: Desktop Drive Model-B00" on page PARTS-6.
-16	0	NP	Drive Pack Assembly (Drive 2) Not a FRU. For detailed breakdown, see "Assembly 3: Base Drive All Models" on page PARTS-8.
-17	50G0322	1	Power Supply Power supply for Drive 2
-18	65F5399	1	RS-422 Cable, DU0 to DU1. Shown attached to rear of Drive 2.
-18	65F5397	1	RS-422 Cable Internal to Drive. Drive 2 only and not shown.
-19	65F5406	1	AC Cable to power supply 2. See Figure 220 on page INST-32 for a detailed listing of the rack mounting hardware.



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# Glossary

This glossary defines the special terms, abbreviations, and acronyms that are used in this publication. If you do not find the term you are looking for, refer to the index or to the *Dictionary of Computing*, New York: McGraw-Hill, 1994.

## A

**ac.** Alternating current.

**access method.** A technique for moving data between main storage and input or output devices.

**ACF.** Automatic cartridge facility.

**adj.** Adjustment.

**AEN.** Asynchronous event notification.

**AIX.** Advanced Interactive Executive. IBM's implementation of the UNIX operating system. The RS/6000 system, among others, runs the AIX operating system.

**alter.** To change.

**ANSI.** American National Standards Institute.

**ASCII.** American National Standard Code for Information Interchange. A 7-bit coded character set (8 bits including parity check) that consists of control characters and graphic characters.

**assigning a device.** The establishing of the relationship of a device to a running task, process, job, or program.

**assignment.** The naming of a specific device to perform a function.

**assistance.** Aid.

**asynchronous.** Pertaining to two or more processes that do not depend upon the occurrence of specific events such as common timing signals.

**attention (notice).** A word for calling attention to the possibility of danger to a program, device, or system, or to data. Contrast with *caution* and *danger*.

**ATTN.** Attention.

## B

**backhitch.** Magnetic tape that makes a slight backward motion just prior to moving forward.

**backup.** To make additional copies of documents or software for safekeeping.

**BCR.** Buffer channel remainder register.

**BCSE.** Buffer channel status/error register.

**BDSE.** Buffer device status/error register.

**beginning-of-tape (BOT).** The location on a magnetic tape that indicates the start of the permissible recording area.

**bezel.** Decorative and safety cover.

**bicolored.** Having two colors.

**BM or bill of materials.** A list of specific types and amounts of direct materials expected to be used to produce a given job or quantity of output.

**BOB.** Beginning-of-block.

**BOT.** Beginning-of-tape.

**buffer.** A routine or storage used to compensate for a difference in rate of flow of data or time of occurrence of events, when transferring data from one device to another.

**bus.** A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment.

## C

**caution (notice).** A word to call attention to possible personal harm to people. Contrast with *attention* and *danger*.

**CCW.** Channel command word.

**CCW chain.** A list of channel command words to be performed in sequence.

**CE.** Customer engineer; field engineer; service representative.

**CEM.** customer engineering memorandum.

**CER.** Channel error register.

**channel command.** An instruction that directs a data channel, control unit, or device to perform an operation or set of operations.

**char.** Character.

**CHK.** Check.

**cm.** Centimeter.

**command.** A control signal that initiates an action or the start of a sequence of actions.

**concurrent.** Refers to diagnostic procedures that can be run on one control unit while the rest of the subsystem remains available for customer applications.

**contingent connection.** A connection between a channel path and a drive caused when a unit check occurs during an I/O operation.

**controller.** A device that provides the interface between a system and one or more tape drives.

**CP.** Circuit protector.

**CRC.** Cyclic redundancy check.

**CRR.** Channel request register.

**ctrl.** Control.

**CU.** Control unit.

## D

**danger (notice).** A word to call attention to possible lethal harm to people. Contrast with *attention* and *caution*.

**data.** Any representations such as characters or analog quantities to which meaning is or might be assigned.

**data buffer.** The storage buffer in the control unit. This buffer is used to increase the data transfer rate between the control unit and the channel.

**data check.** A synchronous or asynchronous indication of a condition caused by invalid data or incorrect positioning of data.

**dc.** Direct current.

**degradation.** A decrease in quality of output or throughput or an increase in machine error rate.

**degraded.** Decreased in quality of output or throughput or increased machine error rate.

**deserialize.** To change from serial-by-bit to parallel-by-byte.

**detented.** A part being held in position with a catch or lever.

**DEV.** Device.

**DIAG.** Diagnostic section of maintenance information manual.

**direct access storage.** A storage device in which the access time is independent of the location of the data.

**DRAM.** Dynamic random-access memory.

**drive, magnetic tape.** A mechanism for moving magnetic tape and controlling its movement.

**DRV.** Drive.

## E

**EBCDIC.** Extended binary-coded decimal interchange code.

**EC.** Edge connector. Engineering change.

**ECC.** Error correction code.

**EEPROM.** Electrically erasable programmable read-only memory.

**EIA.** Electronics Industries Association.

**EIA unit.** A unit of measure, established by the Electronic Industries Association, equal to 44.45 millimeters (1.75 inches).

**end-of-block (EOB).** A code that marks the end of a block of data.

**end-of-file (EOF).** A code that marks the end of a file of data.

**end-of-tape (EOT).** The end of the recording area on a tape.

**EOB.** End-of-block.

**EOF.** End-of-file.

**EOT.** End-of-tape.

**EPO.** Emergency power off.

**EPROM.** Erasable programmable read only memory.

**EQC.** Equipment check.

**equipment check.** An asynchronous indication of a malfunction.

**EREP.** Environmental recording, editing, and printing.

**Error log.** A dataset or file in a product or system where error information is stored for later access.

**ESD.** Electrostatic discharge.

## F

**fault symptom code (FSC).** A hexadecimal code generated by the drive or the control unit microcode in response to a detected subsystem error.

**FC.** Feature code.

**FCC.** Federal communications commission.

**FE.** Field engineer, customer engineer, or service representative.

**FID.** FRU identifier (may be more than one FRU). For additional information, see "FID Entry Point" on page START-12.

**field replaceable unit (FRU).** An assembly that is replaced in its entirety when any one of its components fails.

**FID entry point.** A place in the START section that lists all the FID numbers and suggested directions to the service representative to accomplish a repair.

**file.** A named set of records stored or processed as a unit. Also referred to as a dataset.

**file protection.** The processes and procedures established in an information system that are designed to inhibit unauthorized access to, contamination of, or deletion of a file.

**FLASH EEPROM.** An electrically erasable programmable read-only memory (EEPROM) that can be updated.

**FMR.** Field microcode replacement.

**format.** The arrangement or layout of data on a data medium.

**formatter.** Part of a magnetic tape subsystem that performs data conversion, speed matching, encoding, first level error recovery, and interfaces to one or more tape drives.

**FP.** File protect.

**frayed.** Damaged as if by an abrasive substance.

**FRU.** Field replaceable unit.

**FSC.** Fault symptom code.

**FSI.** Fault symptom index.

**functional microcode.** Microcode that is resident in the machine during normal customer operation.

## G

**g.** Gram.

**gnd.** Ground.

## H

**hertz (Hz).** Unit of frequency. One hertz equals one cycle per second.

**hex.** Hexadecimal.

**Hz.** Hertz (cycles per second).

## I

**ID.** Identifier.

**identifier (ID).** (1) In programming languages, a lexical unit that names a language object; for example, the names of variables, arrays, records, labels, or procedures. An identifier usually consists of a letter optionally followed by letters, digits, or other characters. (2) One or more characters used to identify or name data element and possibly to indicate certain properties of that data element. (3) A sequence of bits or characters that identifies a program, device, or system to another program, device, or system.

**IDRC.** Improved Data Recording Capability.

**IML.** Initial microprogram load.

**Improved Data Recording Format.** An improved data recording mode that can increase the effective data capacity and the effective data rate when enabled and invoked.

**initial microprogram load (IML).** The action of loading a microprogram from an external storage to writable control storage.

**initiator.** The component that executes a command. The initiator can be the host system or the tape control unit.

**INST.** Installation.

**interblock gap (IBG).** An area on a data medium to indicate the end of a block or physical record.

**interface.** A shared boundary. An interface might be a hardware component to link two devices or it might be a portion of storage or registers accessed by two or more computer programs.

**interposer.** The part used to convert a 68-pin connector to a 50-pin D-shell connector.

**intervention required.** Manual action is needed.

**INTRO.** Introduction.

**I/O.** Input/output.

**IOP.** Input/output processor.

**IPL.** Initial program load.

**IPS.** Independent Position Sensor.

**IOCDS.** I/O configuration data set.

**IOCP.** I/O Configuration Program.

**ITST.** Idle-time self-test.

## K

**km.** kilometer.

## L

**LAN.** Local area network. A computer network within a limited area.

**LED.** Light-emitting diode.

**loadable.** Having the ability to be loaded.

**LUN.** Logical unit.

**LZ-1.** Lempel-Ziv electronic data compactor.

## M

**Magazine.** A container of 10 cartridges that is loaded into the Library.

**magnetic tape.** A tape with a magnetical surface layer on which data can be stored by magnetic recording.

**MAP.** Maintenance analysis procedure.

**mask.** A pattern of characters that controls the retention or elimination of portions of another pattern of characters. To use a pattern of characters to control the

retention or elimination of portions of another pattern of characters.

**master file.** A file used as an authority in a given job and that is relatively permanent, even though its contents may change. Synonymous with main file.

**media capacity.** The amount of data that can be contained on a storage medium, expressed in bytes of data.

**micro.** One millionth of.

**microcode.** (1) One or more micro instructions. (2) A code, representing the instructions of an instruction set, implemented in a part of storage that is not program-addressable. (3) To design, write, and test one or more micro instructions. (4) See also *microprogram*.

**microdiagnostic routine.** A program that runs under the control of a supervisor, usually to identify field replaceable units.

**microdiagnostic utility.** A program that is run by the customer engineer to test the machine.

**microinstruction.** A basic or elementary machine instruction.

**microprogram.** A group of microinstructions that when executed performs a preplanned function.

The term microprogram represents a dynamic arrangement or selection of one or more groups of microinstructions for execution to perform a particular function. The term microcode represents microinstructions used in a product as an alternative to hard-wired circuitry to implement certain functions of a processor or other system component.

**Migration.** Going from one tape subsystem to a different tape subsystem.

**MIM.** Media information message.

**mm.** Millimeter.

**modifier.** That which changes the meaning.

**mount a device.** To assign an I/O device with a request to the operator.

**MP.** Microprocessor.

**ms.** Millisecond.

**MSG.** Message.

**multipath.** Pertaining to using more than one path.



## N

**N/A.** Not applicable.

**node.** In a network, a point at which one or more functional units connect channels or data circuits.

**NVS.** Nonvolatile storage. A storage device whose contents are not lost when power is cut off.

## O

**OEM.** Original equipment manufacturer.

**offline.** Pertaining to the operation of a functional unit without the continual control of a computer. Contrast with *online*.

**online.** Pertaining to the operation of a functional unit that is under the continual control of a computer. Contrast with *offline*.

**OPER.** Operation.

**ov.** Over voltage.

**overrun.** Loss of data because a receiving device is unable to accept data at the rate it is transmitted.

**overtightening.** To tighten too much.

## P

**parameter.** A variable that is given a constant value for a specified application and that may denote the application.

**PCC.** Power control compartment.

**PE.** Product engineer.

**PGID.** Path group identification.

**PM.** Preventive maintenance.

**POR.** Power-on reset.

**port.** A physical connection for communication between the 3570 and the host processor. The 3570 has one SCSI port.

**POST.** Power-on self-test.

**Power-on self-test (POST).** A series of diagnostic tests that are run automatically by a device when the power is turned on.

**PROM.** Programmable read only memory.

**PS.** Power supply.

**PTF.** Program temporary fix.

**PWR.** Power.

## R

**RACL.** Random access cartridge loader.

**RAM.** Random access memory.

**Random access memory.** A storage device into which data is entered and from which data is retrieved in a nonsequential manner.

**RAS.** Reliability, availability, and serviceability.

**record.** A collection of related data or words, treated as a unit.

**recording density.** The number of bits in a single linear track measured per unit of length of the recording medium.

**recoverable error.** An error condition that allows continued execution of a program.

**ref.** Reference.

**reg.** Register.

**reinventary.** To inventory again.

**retension.** The process or function of tightening the tape onto the cartridge or cassette if it is sensed that the tape has a loose wrap on the cartridge or cassette.

**RPQ.** Request for price quotation.

**R/W.** Read/write.

## S

**s.** Seconds of time.

**SCSI.** Small computer system interface.

**segment.** A part.

**sel.** Select.

**serialize.** To change from parallel-by-byte to serial-by-bit.

**serializer.** A device that converts a space distribution of simultaneous states representing data into a corresponding time sequence of states.

**SIM.** Service information message.

**small computer system interface (SCSI).** An input and output bus that provides a standard interface between the host system and the 3570.

**SNS.** Sense.

**special feature.** A feature that can be ordered to enhance the capability, storage capacity, or performance of a product, but is not essential for its basic work.

**SR.** Service representative, see also *CE*.

**SRAM.** Static random access memory.

**SS.** Status store.

**ST.** Store.

**standard feature.** The significant design elements of a product that are included as part of the fundamental product.

**START.** Start maintenance.

**Stoplock.** A position-hold mode used when the tape is in a stopped position and under tension.

**subsystem.** A secondary or subordinate system, usually capable of operating independently of, or asynchronously with, a controlling system.

**SUPP.** Support.

**sync.** Synchronous, synchronize. Occurring with a regular or predictable time relationship.

## T

**TAC.** Technical area code.

**tachometer, tach.** A device that emits pulses that are used to measure/check speed or distance.

**tape cartridge.** A container holding magnetic tape that can be processed without separating it from the container.

**tape cassette.** A container holding magnetic tape that can be processed without separating it from the container.

**tape void.** An area in the tape in which no signal can be detected.

**TCU.** Tape control unit.

**TH.** Thermal.

**thread/load operation.** A procedure that places tape along the tape path.

**TM.** Tapemark.

## U

**UART.** Universal asynchronous receiver/transmitter.

**unload.** Prepare the tape cartridge or cassette for removal from the drive.

**utilities.** Utility programs.

**utility programs.** A computer program in general support of the processes of a computer; for instance, a diagnostic program.

**uv.** Under voltage.

## V

**VOLSER.** Volume serial number.

**volume.** A certain portion of data, together with its data carrier, that can be handled conveniently as a unit.

**VPD.** Vital product data. The information contained within the tape drive that requires nonvolatile storage used by functional areas of the drive, and information required for manufacturing, RAS, and engineering.

## W

**word.** A character string that is convenient for some purpose to consider as an entity.

**Write.** Write command.

**WT.** world trade.

## X

**XR.** External register.

**XRA.** External register address register.

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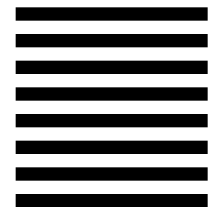
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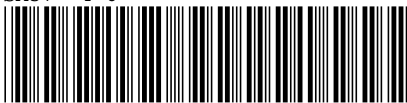
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WQ1278	A21MCTRL SCRIPT	APPENDA-12	APPENDA-12
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WQX539	A21MCTRL SCRIPT	i	(1) cable (2) part numbers, SCSI bus PROC-90
CODETB	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex
WQX148	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex (2) code table, ASCII to hex MSG-7
WQX157	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex (2) code table, ASCII to hex MSG-17
WQX167	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex (2) code table, ASCII to hex MSG-24
WQX172	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex (2) code table, ASCII to hex MSG-30
WQX443	A21MCTRL SCRIPT	i	(1) Code table ASCII to hex (2) code table, ASCII to hex PROC-37
CNLI	A21MCTRL SCRIPT	i	(1) configuration
WQX130	A21MCTRL SCRIPT	i	(1) configuration (2) base LIBRARY-7

WQX131	A21MCTRL SCRIPT i	(1) configuration (2) split LIBRARY-7
WQX177	A21MCTRL SCRIPT i	(1) configuration (2) base PANEL-8
WQX178	A21MCTRL SCRIPT i	(1) configuration (2) split PANEL-8
WQX199	A21MCTRL SCRIPT i	(1) configuration (2) base PANEL-16
WQX200	A21MCTRL SCRIPT i	(1) configuration (2) split PANEL-16
WQX437	A21MCTRL SCRIPT i	(1) configuration (2) base PROC-33
WQX438	A21MCTRL SCRIPT i	(1) configuration (2) split PROC-33
DEVICE	A21MCTRL SCRIPT i	(1) device
WQX414	A21MCTRL SCRIPT i	(1) device (2) power-on procedure PROC-7
DRIVE	A21MCTRL SCRIPT i	(1) drive
WQX55	A21MCTRL SCRIPT i	(1) drive (2) attention drive messages START-24
WQX254	A21MCTRL SCRIPT i	(1) drive (2) test, option PANEL-31
WQX265	A21MCTRL SCRIPT i	(1) drive (2) read/write test, option PANEL-32
WQX291	A21MCTRL SCRIPT i	(1) drive (2) serial number PANEL-41
WQX299	A21MCTRL SCRIPT i	(1) drive (2) microcode EC level PANEL-41
WQX305	A21MCTRL SCRIPT i	(1) drive (2) features, menu PANEL-42
WQX306	A21MCTRL SCRIPT i	(1) drive (2) model number PANEL-42
WQX431	A21MCTRL SCRIPT i	(1) drive (2) auto cleaning PROC-28
WQX433	A21MCTRL SCRIPT i	(1) drive (2) head cleaning PROC-28
WQX439	A21MCTRL SCRIPT i	(1) drive (2) serial number PROC-36
DDRIVE	A21MCTRL SCRIPT i	(1) device driver
WQX45	A21MCTRL SCRIPT i	(1) device driver (2) publications

			x
WQX472	A21MCTRL SCRIPT	i	(1) device driver (2) SunOS PROC-63
WQX478	A21MCTRL SCRIPT	i	(1) device driver (2) Update microcode, HP-UX PROC-65
WQX490	A21MCTRL SCRIPT	i	(1) device driver (2) Update microcode, Windows NT PROC-68
WQX501	A21MCTRL SCRIPT	i	(1) device driver (2) windows NT PROC-70
WQX505	A21MCTRL SCRIPT	i	(1) device driver (2) AIX PROC-76
WQX514	A21MCTRL SCRIPT	i	(1) device driver (2) SunOS PROC-80
WQX518	A21MCTRL SCRIPT	i	(1) device driver (2) HP-UX PROC-83
WQX525	A21MCTRL SCRIPT	i	(1) device driver (2) Windows NT Environment PROC-83
DRVSN	A21MCTRL SCRIPT	i	(1) Drive Serial Number
WQX303	A21MCTRL SCRIPT	i	(1) Drive Serial Number (2) Drive Serial Number Menu PANEL-42
DUMP	A21MCTRL SCRIPT	i	(1) dump
WQX235	A21MCTRL SCRIPT	i	(1) dump (2) data PANEL-30
WQX271	A21MCTRL SCRIPT	i	(1) dump (2) options menu PANEL-34
WQX458	A21MCTRL SCRIPT	i	(1) dump (2) to cartridge (library models) PROC-56
WQX460	A21MCTRL SCRIPT	i	(1) dump (2) to cartridge (drive-only models) PROC-57
WQX465	A21MCTRL SCRIPT	i	(1) dump (2) to AS/400 PROC-58
WQX474	A21MCTRL SCRIPT	i	(1) dump (2) to Sun system PROC-64
WQX480	A21MCTRL SCRIPT	i	(1) dump (2) to HP—UX system PROC-66
WQX492	A21MCTRL SCRIPT	i	(1) dump (2) to Windows NT system PROC-69
EIA	A21MCTRL SCRIPT	i	(1) EIA
WQX372	A21MCTRL SCRIPT	i	(1) EIA (2) units required INST-14
WQX376	A21MCTRL SCRIPT	i	(1) EIA

			(2) units required INST-25
WQX380	A21MCTRL SCRIPT i		(1) EIA (2) units required INST-35
WQX643	A21MCTRL SCRIPT i		(1) EIA (2) unit, description Gloss-2
ERROR	A21MCTRL SCRIPT i		(1) error
WQX142	A21MCTRL SCRIPT i		(1) error (2) logs, RS/6000 MSG-3
WQX144	A21MCTRL SCRIPT i		(1) error (2) log data, RS/6000 MSG-3
WQX159	A21MCTRL SCRIPT i		(1) error (2) logs, Sun MSG-22
WQX301	A21MCTRL SCRIPT i		(1) error (2) logging, force PANEL-41
FEATC	A21MCTRL SCRIPT i		(1) feature codes
WQX74	A21MCTRL SCRIPT i		(1) feature codes (2) feature code INTRO-35
FID	A21MCTRL SCRIPT i		(1) FID
WQX106	A21MCTRL SCRIPT i		(1) FID (2) how posted INTRO-47
WQX310	A21MCTRL SCRIPT i		(1) FID (2) log menu PANEL-44
WQX312	A21MCTRL SCRIPT i		(1) FID (2) FE log menu PANEL-45
WQX314	A21MCTRL SCRIPT i		(1) FID (2) FF log menu PANEL-46
WQX418	A21MCTRL SCRIPT i		(1) FID (2) FF PROC-8
WQX543	A21MCTRL SCRIPT i		(1) FID (2) E5 PROC-92
WQX546	A21MCTRL SCRIPT i		(1) FID (2) E6 PROC-94
WQX547	A21MCTRL SCRIPT i		(1) FID (2) E7 PROC-94
WQX550	A21MCTRL SCRIPT i		(1) FID (2) FE PROC-98
WQX557	A21MCTRL SCRIPT i		(1) FID (2) B2 CARR-12
WQX559	A21MCTRL SCRIPT i		(1) FID (2) BE CARR-13
WQX563	A21MCTRL SCRIPT		



		i	(1) FID (2) EA CARR-16
WQX565	A21MCTRL SCRIPT	i	(1) FID (2) EB CARR-20
WQX567	A21MCTRL SCRIPT	i	(1) FID (2) D0 CARR-25
WQX569	A21MCTRL SCRIPT	i	(1) FID (2) EC CARR-26
WQX571	A21MCTRL SCRIPT	i	(1) FID (2) E9 CARR-26
WQX573	A21MCTRL SCRIPT	i	(1) FID (2) E9 CARR-28
WQX575	A21MCTRL SCRIPT	i	(1) FID (2) BC CARR-28
WQX577	A21MCTRL SCRIPT	i	(1) FID (2) DA CARR-29
WQX579	A21MCTRL SCRIPT	i	(1) FID (2) B0 CARR-30
WQX581	A21MCTRL SCRIPT	i	(1) FID (2) B1 CARR-31
WQX583	A21MCTRL SCRIPT	i	(1) FID (2) C1 CARR-32
WQX585	A21MCTRL SCRIPT	i	(1) FID (2) C9 CARR-32
WQX587	A21MCTRL SCRIPT	i	(1) FID (2) CA CARR-33
WQX589	A21MCTRL SCRIPT	i	(1) FID (2) CB CARR-34
WQX591	A21MCTRL SCRIPT	i	(1) FID (2) DD CARR-34
WQX593	A21MCTRL SCRIPT	i	(1) FID (2) DE CARR-34
WQX595	A21MCTRL SCRIPT	i	(1) FID (2) 90 CARR-36
WQX597	A21MCTRL SCRIPT	i	(1) FID (2) 91 CARR-36
WQX599	A21MCTRL SCRIPT	i	(1) FID (2) 92 CARR-36
WQX601	A21MCTRL SCRIPT	i	(1) FID (2) 94 CARR-37
WQX603	A21MCTRL SCRIPT	i	(1) FID

		(2) 95 CARR-38
WQX605	A21MCTRL SCRIPT i	(1) FID (2) 97 CARR-38
WQX607	A21MCTRL SCRIPT i	(1) FID (2) 99 CARR-39
WQX609	A21MCTRL SCRIPT i	(1) FID (2) 9A CARR-40
WQX611	A21MCTRL SCRIPT i	(1) FID (2) 9B CARR-41
WQX613	A21MCTRL SCRIPT i	(1) FID (2) 9C CARR-42
WQX615	A21MCTRL SCRIPT i	(1) FID (2) 9D CARR-43
WQX617	A21MCTRL SCRIPT i	(1) FID (2) 9E CARR-48
WQX619	A21MCTRL SCRIPT i	(1) FID (2) A0 CARR-48
WQX621	A21MCTRL SCRIPT i	(1) FID (2) A1 CARR-49
WQX623	A21MCTRL SCRIPT i	(1) FID (2) A2 CARR-49
WQX625	A21MCTRL SCRIPT i	(1) FID (2) A3 CARR-49
WQX627	A21MCTRL SCRIPT i	(1) FID (2) A5 CARR-50
WQX629	A21MCTRL SCRIPT i	(1) FID (2) A6 CARR-50
WQX631	A21MCTRL SCRIPT i	(1) FID (2) AA CARR-51
WQX633	A21MCTRL SCRIPT i	(1) FID (2) DB CARR-51
WQX635	A21MCTRL SCRIPT i	(1) FID (2) DC CARR-52
FMR	A21MCTRL SCRIPT i	(1) FMR
WQX238	A21MCTRL SCRIPT i	(1) FMR (2) make tape PANEL-30
WQX278	A21MCTRL SCRIPT i	(1) FMR (2) tape menu PANEL-36
WQX280	A21MCTRL SCRIPT i	(1) FMR (2) make tape PANEL-36
WQX281	A21MCTRL SCRIPT	

		i	(1) FMR (2) copy tape to card pack PANEL-36
WQX282	A21MCTRL SCRIPT	i	(1) FMR (2) microcode update PANEL-36
WQX444	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, make tape (library models) PROC-39
WQX445	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, make tape (drive-only models) PROC-39
WQX446	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, make scratch tape (library models) PROC-41
WQX447	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, make scratch tape (drive-only models) PROC-41
WQX448	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, update from tape PROC-42
WQX450	A21MCTRL SCRIPT	i	(1) FMR (2) instructions, update from tape PROC-46
HASCII	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII
WQX147	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII (2) table, hex conversion to ASCII MSG-7
WQX156	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII (2) table, hex conversion to ASCII MSG-17
WQX166	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII (2) table, hex conversion to ASCII MSG-24
WQX171	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII (2) table, hex conversion to ASCII MSG-30
WQX442	A21MCTRL SCRIPT	i	(1) Hex conversion, ASCII (2) table, hex conversion to ASCII PROC-37
HPUX	A21MCTRL SCRIPT	i	(1) HP-UX Environment
WQX476	A21MCTRL SCRIPT	i	(1) HP-UX Environment (2) updating microcode from PROC-65
ICON	A21MCTRL SCRIPT	i	(1) icon
WQX102	A21MCTRL SCRIPT	i	(1) icon (2) wrench INTRO-40
INSTALL	A21MCTRL SCRIPT	i	(1) install
WQX243	A21MCTRL SCRIPT	i	(1) install (2) menu PANEL-30
WQX365	A21MCTRL SCRIPT	i	(1) install (2) device INST-2
WQX381	A21MCTRL SCRIPT	i	(1) install (2) checkout, library models INST-43
WQX407	A21MCTRL SCRIPT	i	(1) install

			(2) reporting INST-69
LED	A21MCTRL SCRIPT	i	(1) LED i
WQX65	A21MCTRL SCRIPT	i	(1) LED (2) description INTRO-12
WQX91	A21MCTRL SCRIPT	i	(1) LED (2) description INTRO-40
WQX97	A21MCTRL SCRIPT	i	(1) LED (2) busy INTRO-40
WQX99	A21MCTRL SCRIPT	i	(1) LED (2) clean INTRO-40
WQX101	A21MCTRL SCRIPT	i	(1) LED (2) maintenance INTRO-40
LIBRARY	A21MCTRL SCRIPT	i	(1) library
WQX533	A21MCTRL SCRIPT	i	(1) library (2) RS-422, port wrap test PROC-89
INDIC	A21MCTRL SCRIPT	i	(1) indicators
MAG	A21MCTRL SCRIPT	i	(1) magazine
WQX68	A21MCTRL SCRIPT	i	(1) magazine (2) description INTRO-32
WQX111	A21MCTRL SCRIPT	i	(1) magazine (2) part number LIBRARY-2
WQX113	A21MCTRL SCRIPT	i	(1) magazine (2) description LIBRARY-2
MSG	A21MCTRL SCRIPT	i	(1) message
WQX149	A21MCTRL SCRIPT	i	(1) message (2) codes MSG-9
WQX151	A21MCTRL SCRIPT	i	(1) message (2) service information MSG-9
WQX160	A21MCTRL SCRIPT	i	(1) message (2) obtain from HP/UX MSG-22
WQX162	A21MCTRL SCRIPT	i	(1) message (2) obtain from Windows NT MSG-22
WQX164	A21MCTRL SCRIPT	i	(1) message (2) obtain from AS/400 MSG-23
MENU	A21MCTRL SCRIPT	i	(1) menu
WQX92	A21MCTRL SCRIPT	i	(1) menu (2) description INTRO-40
WQX228	A21MCTRL SCRIPT	i	(1) menu (2) options, CE mode PANEL-26
WQX231	A21MCTRL SCRIPT	i	(1) menu

			(2) options PANEL-30
WQX233	A21MCTRL SCRIPT	i	(1) menu (2) options PANEL-30
WQX242	A21MCTRL SCRIPT	i	(1) menu (2) configure PANEL-30
WQX244	A21MCTRL SCRIPT	i	(1) menu (2) install PANEL-30
WQX250	A21MCTRL SCRIPT	i	(1) menu (2) utilities PANEL-30
WQX252	A21MCTRL SCRIPT	i	(1) menu (2) verify fix PANEL-30
WQX260	A21MCTRL SCRIPT	i	(1) menu (2) loop diag PANEL-32
WQX269	A21MCTRL SCRIPT	i	(1) menu (2) main dump PANEL-33
WQX270	A21MCTRL SCRIPT	i	(1) menu (2) dump options PANEL-34
WQX272	A21MCTRL SCRIPT	i	(1) menu (2) object alias PANEL-34
WQX274	A21MCTRL SCRIPT	i	(1) menu (2) address PANEL-35
WQX277	A21MCTRL SCRIPT	i	(1) menu (2) copy dump to tape PANEL-35
WQX279	A21MCTRL SCRIPT	i	(1) menu (2) FMR tape PANEL-36
WQX284	A21MCTRL SCRIPT	i	(1) menu (2) select EC level PANEL-37
WQX286	A21MCTRL SCRIPT	i	(1) menu (2) load scratch tape PANEL-38
WQX288	A21MCTRL SCRIPT	i	(1) menu (2) load FMR tape PANEL-40
WQX290	A21MCTRL SCRIPT	i	(1) menu (2) config/install PANEL-41
WQX294	A21MCTRL SCRIPT	i	(1) menu (2) config/install PANEL-41
WQX307	A21MCTRL SCRIPT	i	(1) menu (2) drive features PANEL-42
WQX308	A21MCTRL SCRIPT	i	(1) menu (2) wrap tools PANEL-43
WQX309	A21MCTRL SCRIPT	i	(1) menu (2) CE logs

WQX311	A21MCTRL SCRIPT	i	PANEL-44 (1) menu (2) error log
WQX313	A21MCTRL SCRIPT	i	PANEL-44 (1) menu (2) FID FE log
WQX315	A21MCTRL SCRIPT	i	PANEL-45 (1) menu (2) FID FF log
WQX317	A21MCTRL SCRIPT	i	PANEL-46 (1) menu (2) utilities
WQX320	A21MCTRL SCRIPT	i	PANEL-47 (1) menu (2) control store
WQX322	A21MCTRL SCRIPT	i	PANEL-47 (1) menu (2) microcode trap
WQX324	A21MCTRL SCRIPT	i	PANEL-47 (1) menu (2) engr use only
WQX326	A21MCTRL SCRIPT	i	PANEL-47 (1) menu (2) OEM use only
WQX329	A21MCTRL SCRIPT	i	PANEL-48 (1) menu (2) control store select address
WQX331	A21MCTRL SCRIPT	i	PANEL-53 (1) menu (2) microcode trap
WQX333	A21MCTRL SCRIPT	i	PANEL-55 (1) menu (2) read tape
WQX335	A21MCTRL SCRIPT	i	PANEL-56 (1) menu (2) process tape
WQX337	A21MCTRL SCRIPT	i	PANEL-57 (1) menu (2) space tape
WQX339	A21MCTRL SCRIPT	i	PANEL-58 (1) menu (2) read block
WQX341	A21MCTRL SCRIPT	i	PANEL-59 (1) menu (2) next block id
WQX343	A21MCTRL SCRIPT	i	PANEL-59 (1) menu (2) password
WQX346	A21MCTRL SCRIPT	i	PANEL-60 (1) menu (2) microcode trap
WQX348	A21MCTRL SCRIPT	i	PANEL-66 (1) menu (2) microcode trap
WQX350	A21MCTRL SCRIPT	i	PANEL-67 (1) menu (2) microcode trap
WQX352	A21MCTRL SCRIPT	i	PANEL-68 (1) menu (2) microcode trap

WQX354	A21MCTRL SCRIPT i	(1) menu (2) microcode trap PANEL-69
WQX552	A21MCTRL SCRIPT i	(1) menu (2) no response PROC-100
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WQX189	A21MCTRL SCRIPT i	(1) menu (2) options PANEL-13
WQX190	A21MCTRL SCRIPT i	(1) menu (2) operator PANEL-13
WQX194	A21MCTRL SCRIPT i	(1) menu (2) set library mode PANEL-15
WQX197	A21MCTRL SCRIPT i	(1) menu (2) SCSI ID (set address) PANEL-16
WQX198	A21MCTRL SCRIPT i	(1) menu (2) set address (SCSI ID) PANEL-16
WQX202	A21MCTRL SCRIPT i	(1) menu (2) auto clean PANEL-17
WQX204	A21MCTRL SCRIPT i	(1) menu (2) services PANEL-18
WQX207	A21MCTRL SCRIPT i	(1) menu (2) change language PANEL-18
WQX209	A21MCTRL SCRIPT i	(1) menu (2) statistics PANEL-18
WQX213	A21MCTRL SCRIPT i	(1) menu (2) show statistics PANEL-20
WQX215	A21MCTRL SCRIPT i	(1) menu (2) clean PANEL-21
WQX218	A21MCTRL SCRIPT i	(1) menu (2) recovery PANEL-22
WQX222	A21MCTRL SCRIPT i	(1) menu (2) import export PANEL-22
WQX226	A21MCTRL SCRIPT i	(1) menu (2) confirm mode change PANEL-23
MODE	A21MCTRL SCRIPT i	(1) mode
WQX71	A21MCTRL SCRIPT i	(1) mode (2) random INTRO-33
WQX116	A21MCTRL SCRIPT i	(1) mode (2) random LIBRARY-3
MICRO	A21MCTRL SCRIPT i	(1) microcode
WQX236	A21MCTRL SCRIPT i	(1) microcode (2) update

			PANEL-30
WQX296	A21MCTRL SCRIPT	i	(1) microcode (2) EC level, drive PANEL-41
WQX321	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-47
WQX330	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-55
WQX345	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-66
WQX347	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-67
WQX349	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-68
WQX351	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-68
WQX353	A21MCTRL SCRIPT	i	(1) microcode (2) trap menu PANEL-69
WQX449	A21MCTRL SCRIPT	i	(1) microcode (2) update from FMR (library models) PROC-42
WQX451	A21MCTRL SCRIPT	i	(1) microcode (2) update from FMR (drive-only models) PROC-46
WQX452	A21MCTRL SCRIPT	i	(1) microcode (2) EC level history log PROC-47
WQX463	A21MCTRL SCRIPT	i	(1) microcode (2) updating from AS/400 PROC-58
WQX468	A21MCTRL SCRIPT	i	(1) microcode (2) updating from RS/6000 PROC-59
WQX471	A21MCTRL SCRIPT	i	(1) microcode (2) updating from Sun PROC-63
WQX477	A21MCTRL SCRIPT	i	(1) microcode (2) updating from HP-UX PROC-65
WQX489	A21MCTRL SCRIPT	i	(1) microcode (2) updating from Windows NT PROC-68
WQX544	A21MCTRL SCRIPT	i	(1) microcode (2) problem, FID E5 PROC-92
OPP	A21MCTRL SCRIPT	i	(1) operator panel
WQX383	A21MCTRL SCRIPT	i	(1) operator panel (2) set address INST-44
OFFL	A21MCTRL SCRIPT	i	(1) offline
WQX103	A21MCTRL SCRIPT	i	(1) offline (2) request, indicator INTRO-40



POWER	A21MCTRL SCRIPT	i	(1) power
WQX94	A21MCTRL SCRIPT	i	(1) power (2) switch INTRO-40
WQX413	A21MCTRL SCRIPT	i	(1) power (2) on procedure PROC-7
WQX415	A21MCTRL SCRIPT	i	(1) power (2) off procedure PROC-7
WQX416	A21MCTRL SCRIPT	i	(1) power (2) remove PROC-7
WQX417	A21MCTRL SCRIPT	i	(1) power (2) restore PROC-7
PUBS	A21MCTRL SCRIPT	i	(1) publications
WQX6	A21MCTRL SCRIPT	i	(1) publications (2) 3570 ix
WQX10	A21MCTRL SCRIPT	i	(1) publications (2) AS/400 ix
WQX24	A21MCTRL SCRIPT	i	(1) publications (2) RISC System/6000 x
WQX35	A21MCTRL SCRIPT	i	(1) publications (2) 9076 SP2 x
WQX46	A21MCTRL SCRIPT	i	(1) publications (2) device drivers x
PRIORC	A21MCTRL SCRIPT	i	(1) priority cell
WQX70	A21MCTRL SCRIPT	i	(1) priority cell (2) use INTRO-32
WQX115	A21MCTRL SCRIPT	i	(1) priority cell (2) use LIBRARY-2
RACL	A21MCTRL SCRIPT	i	(1) RACL
WQX58	A21MCTRL SCRIPT	i	(1) RACL (2) attention library messages START-25
WQX110	A21MCTRL SCRIPT	i	(1) RACL (2) description LIBRARY-2
WQX255	A21MCTRL SCRIPT	i	(1) RACL (2) test, option PANEL-31
RANDR	A21MCTRL SCRIPT	i	(1) remove and replace
WQX553	A21MCTRL SCRIPT	i	(1) remove and replace (2) library chassis covers CARR-4
WQX554	A21MCTRL SCRIPT	i	(1) remove and replace (2) decorative cover, drive-only models CARR-5
WQX555	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive pack, library models

			CARR-8
WQX556	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive pack, drive-only models CARR-8
WQX558	A21MCTRL SCRIPT	i	(1) remove and replace (2) cooling pack CARR-12
WQX560	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive cooling fan CARR-13
WQX561	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive assembly front cover CARR-15
WQX562	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive assembly top cover CARR-16
WQX564	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive logic card CARR-16
WQX566	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive analog card CARR-20
WQX568	A21MCTRL SCRIPT	i	(1) remove and replace (2) head-actuator assembly CARR-25
WQX570	A21MCTRL SCRIPT	i	(1) remove and replace (2) drive servo card CARR-26
WQX572	A21MCTRL SCRIPT	i	(1) remove and replace (2) mother board CARR-26
WQX574	A21MCTRL SCRIPT	i	(1) remove and replace (2) mother board CARR-28
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PANEL-42, PANEL-43, PANEL-43, PANEL-45,  
PANEL-45, PANEL-45, PANEL-45, INST-2, INST-2,  
INST-3, INST-4, INST-5, INST-5, INST-5, INST-6, INST-6,  
INST-6, INST-12, INST-12, INST-14, INST-14, INST-25,  
INST-25, INST-45, INST-45, PROC-18, PROC-18,  
PROC-20, PROC-20, PROC-25, PROC-25, PROC-29,  
PROC-29, PROC-39, PROC-39, PROC-39, PROC-39,  
PROC-42, PROC-42, PROC-46, PROC-46, PROC-46,  
PROC-46, PROC-46, PROC-46, PROC-53, PROC-53,  
PROC-53, PROC-53, PROC-54, PROC-54, PROC-56,  
PROC-56, PROC-57, PROC-57, PROC-61, PROC-61,  
PROC-74, PROC-74, PROC-80, PROC-81, PROC-90,  
PROC-90, CARR-17, CARR-17, CARR-25, CARR-25,  
CARR-27, CARR-27, CARR-28, CARR-28, CARR-28,  
CARR-28, CARR-29, CARR-29, CARR-32, CARR-32,  
CARR-36, CARR-36, CARR-37, CARR-37, CARR-37,  
CARR-37, CARR-38, CARR-38, PARTS-5, PARTS-5,  
PARTS-9, PARTS-9, PARTS-9, PARTS-9, PARTS-9,  
PARTS-9, PARTS-11, PARTS-11, PARTS-15, PARTS-15,  
PARTS-17, PARTS-17, PARTS-21, PARTS-21,  
PARTS-21, PARTS-21, PARTS-23, PARTS-23,  
PARTS-23, PARTS-23, PARTS-23, PARTS-23

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INST-52, INST-52, INST-52, INST-52, INST-67, INST-68,  
 INST-70, INST-70, INST-70, INST-70, INST-70, PROC-80,  
 PROC-83, PARTS-21, PARTS-21, PARTS-21,  
 PARTS-21, PARTS-22, PARTS-22, PARTS-23,  
 PARTS-23, PARTS-23, PARTS-23

<b>Spots</b>
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<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
XTAPEUT	A21MCTRL SCRIPT	MSG-3	(no text) MSG-3
DIAG	A21MCTRL SCRIPT	MSG-3	(no text) MSG-3
TSTHD1	A21MCTRL SCRIPT	PANEL-32	(no text)
TSTTAP1	A21MCTRL SCRIPT	PANEL-32	(no text)
HEADTST	A21MCTRL SCRIPT	PANEL-61	(no text)
TAPETST	A21MCTRL SCRIPT	PANEL-61	(no text)
SCBSCB2	A21MCTRL SCRIPT	INST-54	(no text)

<b>Processing Options</b>
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## Runtime values:

Document fileid .....	A21MCTRL SCRIPT
Document type .....	USERDOC
Document style .....	IBMXAGD
Profile .....	EDFPRF40
Service Level .....	0030
SCRIPT/VS Release .....	4.0.0
Date .....	98.10.27
Time .....	09:49:42
Device .....	PSA
Number of Passes .....	4
Index .....	YES
SYSVAR R .....	A21MCTRL
SYSVAR V .....	A21MCTRL
SYSVAR W .....	A21MCTRL
SYSVAR X .....	YES

## Formatting values used:

Annotation .....	NO
Cross reference listing .....	YES
Cross reference head prefix only .....	NO
Dialog .....	LABEL
Duplex .....	YES
DVCF conditions file .....	(none)
DVCF value 1 .....	(none)
DVCF value 2 .....	(none)
DVCF value 3 .....	(none)
DVCF value 4 .....	(none)
DVCF value 5 .....	(none)
DVCF value 6 .....	(none)
DVCF value 7 .....	(none)
DVCF value 8 .....	(none)
DVCF value 9 .....	(none)
Explode .....	NO
Figure list on new page .....	YES
Figure/table number separation .....	NO
Folio-by-chapter .....	NO
Head 0 body text .....	(none)
Head 1 body text .....	(none)
Head 1 appendix text .....	Appendix
Hyphenation .....	NO
Justification .....	NO
Language .....	ENGL
Keyboard .....	395

Layout ..... OFF  
Leader dots ..... YES  
Master index ..... (none)  
Partial TOC (maximum level) ..... 4  
Partial TOC (new page after) ..... INLINE  
Print example id's ..... NO  
Print cross reference page numbers ..... YES  
Process value ..... (none)  
Punctuation move characters ..... ,  
Read cross-reference file ..... A21MCTRL  
Running heading/footing rule ..... NONE  
Show index entries ..... NO  
Table of Contents (maximum level) ..... 2  
Table list on new page ..... YES  
Title page (draft) alignment ..... NO  
Write cross-reference file ..... A21MCTRL

**Imbed Trace**

DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#INIT' LINE 1830: .im DSMREFS  
DSMMOM397I '.EDF#INIT' WAS IMBEDDED AT LINE 1830 OF '.EDF#INIT'  
DSMMOM397I '.EDF#INIT' WAS IMBEDDED AT LINE 360 OF '.EDF#MAIN'  
DSMMOM397I '.EDF#MAIN' WAS IMBEDDED AT LINE 177 OF 'EDFPRF40'  
DSMMOM397I 'EDFPRF40' WAS IMBEDDED AT LINE 0 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#TOC' LINE 340: .im DSMTOC  
DSMMOM397I '.EDF#TOC' WAS IMBEDDED AT LINE 340 OF '.EDF#TOC'  
DSMMOM397I '.EDF#TOC' WAS IMBEDDED AT LINE 664 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT1  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 907 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT2  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 4577 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT3  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 6315 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT4  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 8230 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT5  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 8965 OF 'A21MCTRL'  
+++EDF024W Invalid value 'page' for WIDTH attribute of XMP tag. (Page MSG-4 File: A21MCTRL  
SCRIPT)  
DSMMOM397I '.EDFXMP' WAS IMBEDDED AT LINE 9098 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT6  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 11803 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT7  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 16622 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT8  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 17129 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT9  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 20250 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT10  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 26246 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#PTOC' LINE 550: .im DSMPT11  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 550 OF '.EDF#PTOC'  
DSMMOM397I '.EDF#PTOC' WAS IMBEDDED AT LINE 28702 OF 'A21MCTRL'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#ALIST' LINE 480: .im DSMASML  
DSMMOM397I '.EDF#ALIST' WAS IMBEDDED AT LINE 480 OF '.EDF#ALIST'  
DSMMOM397I '.EDF#ALIST' WAS IMBEDDED AT LINE 29952 OF 'A21MCTRL'  
DSMBEG323I STARTING PASS 2 OF 4.  
+++EDF024W Invalid value 'page' for WIDTH attribute of XMP tag. (Page MSG-4 File: A21MCTRL  
SCRIPT)  
DSMMOM397I '.EDFXMP' WAS IMBEDDED AT LINE 9098 OF 'A21MCTRL'

DSMBEG323I STARTING PASS 3 OF 4.

+++EDF024W Invalid value 'page' for WIDTH attribute of XMP tag. (Page MSG-4 File: A21MCTRL SCRIPT)

DSMMOM397I '.EDFXMP' WAS IMBEDDED AT LINE 9098 OF 'A21MCTRL'

DSMBEG323I STARTING PASS 4 OF 4.

+++EDF024W Invalid value 'page' for WIDTH attribute of XMP tag. (Page MSG-4 File: A21MCTRL SCRIPT)

DSMMOM397I '.EDFXMP' WAS IMBEDDED AT LINE 9098 OF 'A21MCTRL'