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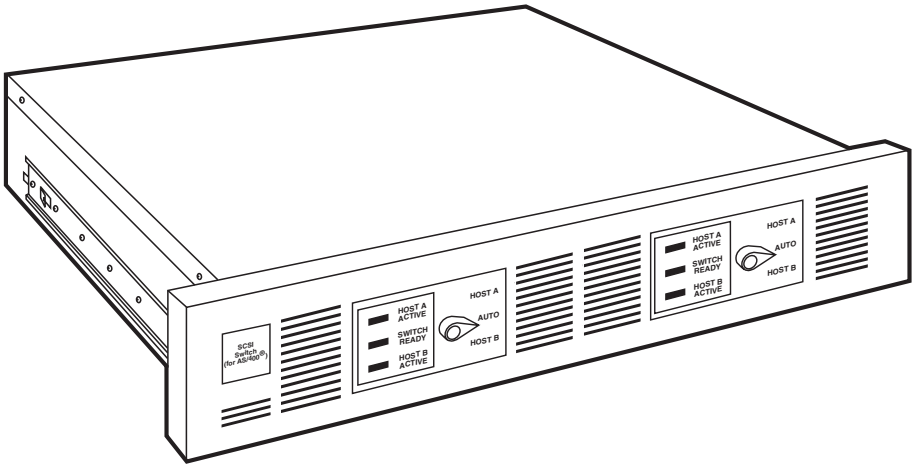
BLACK BOX®
NETWORK SERVICES

DECEMBER 1995
SW847A
SW848A

SCSI Switch (for AS/400®)



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NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS

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CONTENTS

1. Specifications

Compatibility—IPL 6790E and IBM® 3490E-EXX Tape Drives

AS/400 Attachment—6501 IOP

Software Requirements—OS/400 Version 2, Release 3 or higher

Mean Time Between Failure (MTBF)—150,000 hr.

Operating Environment—*Temperature*: 60° to 90° F (15.5° to 32° C); *Relative Humidity*: 20 to 80%

Cables Required—*SW847A*: (1) for connection to tape device (included with your tape device), (2) for connection to host CPUs (included with the SCSI Switch); *SW848A*: (2) for connection to tape device (included with your tape devices), (4) for connection to host CPUs (included with the SCSI Switch)

Power—110 to 240 VAC, auto-sensing, 0.16 KVA

Size—*Both SW847A and SW848A*: 3.3"H x 19"W x 26.3"D (8.3 x 48 x 67 cm)

Weight—*Both SW847A and SW848A:* 21 lb. (9.5 kg)

2. Introduction

The SCSI Switch (for AS/400®) is a dynamic fast/wide switching device that provides intelligent unattended switching of IPL 6790E and IBM 3490E-EXX 1/2" cartridge tape drives between AS/400 hosts.

The SCSI Switch features include:

- Unattended switching support for up to two tape drives and four host systems
- 100% compatibility with OS/400
- Compact rackmount design
- Industry's only dynamic switching device for Fast/Wide SCSI tape drives

Cost-Effective CPU Sharing

Through OS/400 commands, the SCSI Switch provides your site with complete unattended tape-drive sharing between multiple AS/400 hosts. The SCSI Switch eliminates the added purchase and maintenance costs needed to support separate 36-track 1/2" cartridge tape drives for each CPU.

Superior Protection

The SCSI Switch features a slim, 2 EIA-unit rackmount design with a control panel that monitors the host CPU and current backup status. A manual override switch protects your equipment if your host CPU fails.

Complete Flexibility

The SCSI Switch connects to the AS/400 9404 and 9406 (Models D, E, F), and all Advanced Series 200 and 300 models. The SCSI Switch is the industry's only unattended tape-drive switching device that attaches to IBM's AS/400 Fast/Wide SCSI 6501 IOP.

3. Installing and Configuring the SCSI Switch

3.1 Subsystem Requirements

Before installing the SCSI Switch (for AS/400®) verify that:

- All environmental, power and space requirements have been met.
- All host system interface requirements have been provided. These requirements can be found in this section. Look under the appropriate "Host System Requirements" for the system in question.

Environmental Requirements

Temperature—*Operating:* 60° to 90° F (15.5° to 32° C),
Non-operating: -40° to 122° F (-40° to 50° C)

Humidity (noncondensing)—*Operating*: 20 to 80%,
Non-operating: 10 to 90%

Power Requirements

The SCSI Switch (for AS/400®) requires a dedicated power receptacle with an isolated earth ground. Power may also be provided via the IBM 9039 rack using an accessory cord.

For 120V outlets at 120 VAC, a NEMA 5-15R receptacle is required.
For 220V outlets at 220 VAC, a NEMA 6-15R receptacle is required.

CAUTION

Water pipes or building conduits are not adequate earth-ground substitutes.

Space Requirements
The SCSI Switch (for AS/400®) can be rack-mounted. It requires two EIA locations in a 9309 rack.

Compatible Racks for the SCSI Switch

The SCSI Switch, which is in a self-contained module, should be mounted in the same rack that your tape drive is mounted in. Usually, you will already have this rack if you already have a tape drive. If you need to order a rack, the following are compatible with both the tape drive and the SCSI Switch:

- IBM 9309 System Rack (SC9125)
- IBM 9309 System Unit/9332 Rack (SC9126)
- IBM 9309 I/O Expansion Rack (SC9130)

3.2 Installing the SCSI Switch in the Rack

Unpacking and Packing

The SCSI Switch (for AS/400®) Subsystem is packaged in electrically conductive containers. Save all packing material in case you need to ship, store, or move the units later.

After you remove the SCSI Switch from the container, inspect it for damage. If the equipment is damaged, immediately contact your dealer.

NOTE

Static electricity is generated by common activities such as walking across a carpet, transporting items in plastic containers, and handling synthetic materials. Electrostatic discharge (ESD) may result in degraded reliability or failures.

Tools Required

The only tools you need to support the SCSI Switch can be found in a standard tool kit:

- a Philips head screwdriver or common screwdriver
- a pair of pliers
- an adjustable wrench

Inventory of Equipment

Before installing the SCSI Switch, make sure you have the following components:

- SCSI Switch (for AS/400®)
- *SW847A:* (2) cables for connecting the Switch to the AS/400 hosts,
  SW848A: (4) cables for connecting the Switch to the AS/400 hosts
- Mounting hardware
- This user manual

If any parts are missing, contact your dealer.

Preparing the IBM 9309 Rack

WARNING

Disconnect power before servicing. You might be shocked!

The rack-mounted SCSI Switch requires 2 EIA units of vertical space. One EIA is equal to 1.75 inches. EIA is the acronym for Electrical Industry Association. Each EIA has a three-hole pattern for mounting rails. Remove the rack filler panel from the location the device is to be installed in.

Mounting the SCSI Switch in the Rack

Figure 3-1 shows the EIA layout for installing the Switch in the top of a 9309 rack.

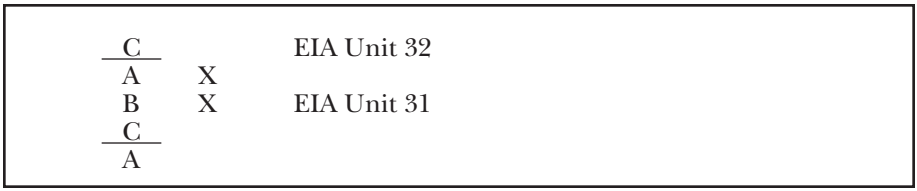

Figure 3-1. EIA Pattern Layout.

Follow these steps to install the Switch in a rack:

1. Loosely install a nut plate on both the front and rear rails of the rack in the lower EIA unit to be used, by putting a 10-32 screw in holes A and B of the EIA unit.

2. Place the rails in position in the rack and tighten the screws.

3. Extend the rails out of the rack to the locked position.

4. Mate the rails on the SCSI Switch chassis to the extended rails, depress the safety latches on the rails, and push the Switch fully into the rack.

Cables Required

(For one or two tape drives and two AS/400 hosts)

Table 3-1. Terminator and Cables Required.

Item	Description	Quantity SW847A	SW848A
Built into unit or included	Feed-Thru Terminator	1	1
Included	External wide SCSI cable	2	4
Included	2 m Standard SCSI cable	1	2

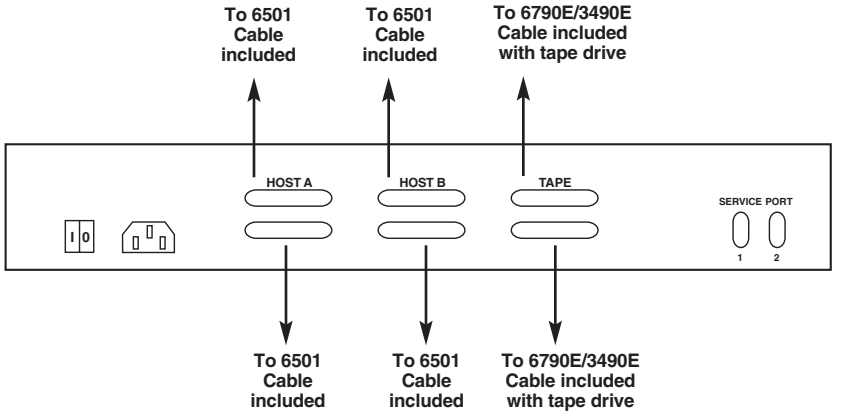

Figure 3-2. Cabling the SCSI Switch.

To configure either tape drive on SW2, follow the cabling instructions listed above, but attach the cables to the top row of connectors.

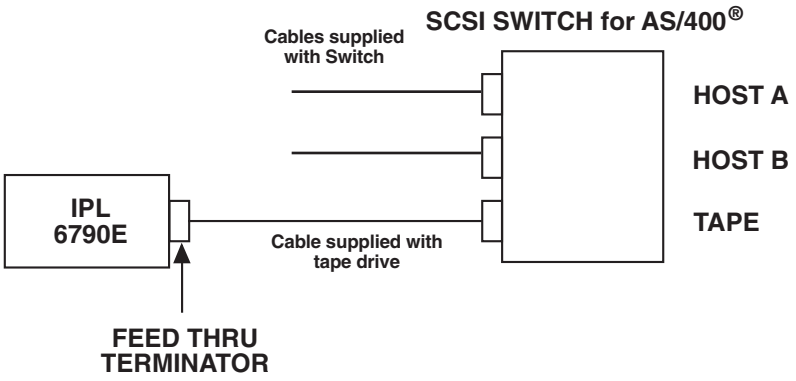

Figure 3-3. Two AS/400 Hosts, One IPL 6790E.

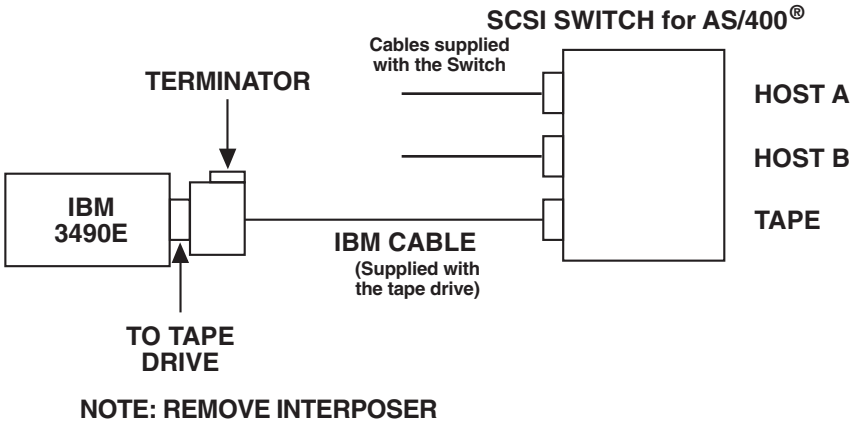

Figure 3-4. Two AS/400 Hosts, One IBM 3490E.

To configure either tape drive on SW2, follow the cabling instructions listed above, but attach the cables to the top row of connectors.

NOTE

Replace the existing cable between the tape drive and the IOP and replace it with the cable supplied with the switch.

With tape drives mounted side by side, the lower connectors will control the tape drive on the left; the upper connectors will control the tape drive on the right.

In a maximum configuration, the SCSI Switch (SW848A) supports unattended switching for two tape drives and four AS/400 hosts.

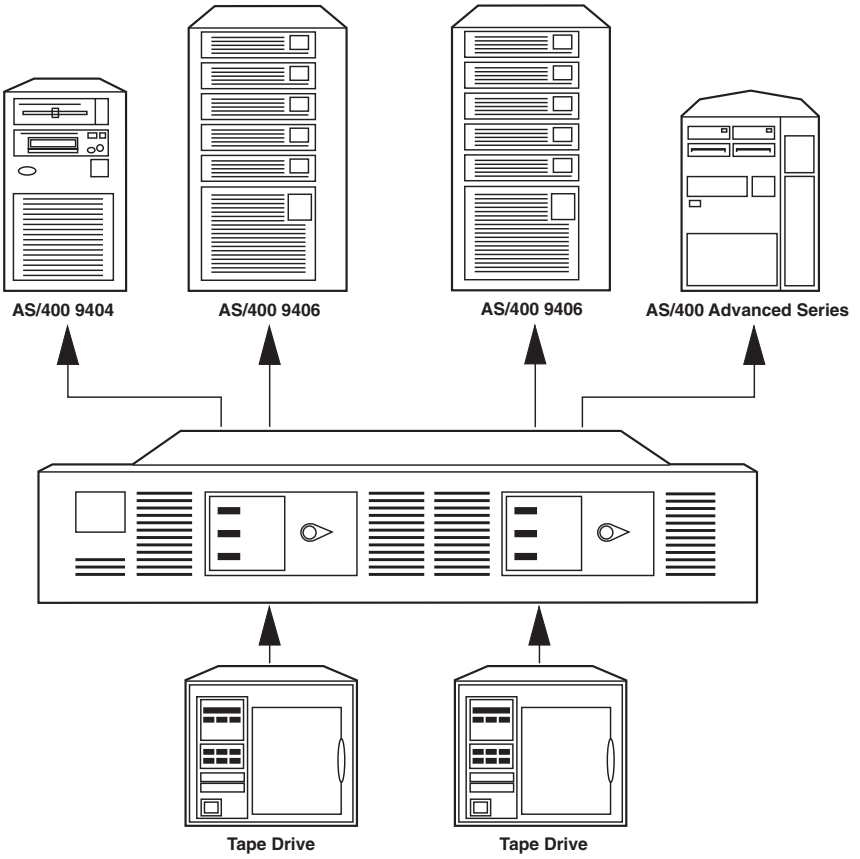

Figure 3–5. SCSI Switch (SW848A), Maximum Configuration.

4. Configuring and Operating the SCSI Switch

4.1 Configuring the SCSI Switch to the AS/400

The following procedures must be performed on one AS/400 at a time. When configuring the drives and the SCSI Switch to the second AS/400, all associated controllers and devices must be varied off on the first AS/400. Failure to do this will cause configuration errors on the second AS/400.

We recommend that you turn OFF Auto-Configure and manually create the controller and device descriptions.

1. Power off both AS/400 hosts.

   Use the following command to end all systems.

   ```
   endsbs *all *immed
   ```

   When all subsystems have ended enter the following:

   ```
   pwrdwnsys *immed
   ```

2. Install the tape drive and the SCSI Switch.

3. Power on one of the AS/400 hosts.

4. Create the controller description.

   Once the AS/400 completes the IPL, sign on as user QSECOFR.

At the command line, enter the command `dsplclhdw`. Scroll through the local hardware screens and identify the 6790E/3490E that was just installed. Locate the resource name associated with the controllers. This resource name will be used when configuring the controller description.

Press F3 to return to the command line.

Enter the command `crtctltap` and press F4. This will display the Create Controller Description screen.

Enter the required parameters to create the controller description.

```
Controller description . .TAPCTL01   (this is an example)
Controller type. . . . .  3490
Controller model . . . . .*ANY
Resource name. . . . . .TAPCTL01  (must match name in step 4)
Online at IPL . . . . . . *YES
Text 'description' . . . .*BLANK
```

Once the controller description is completed, press F3 to return to the command line.

5. Create the device description.

Enter the command `crtdevtap` and press F4. This will display the Create Device Description screen.

Enter the required parameters to create the device description.

```
Device description . . . . TAP02  (this is an example)
Device type. . . . . . . . 3490
Device model . . . . . . . *ANY
Resource name. . . . . . . TAP02  (this is an example)
Switch setting . . . . . . 0
Online at IPL. . . . . . . *NO
Attached controller. . . .TAPCTL01  (this is an example)
Assign device at vary on . *YES
Unload device at vary off. *YES
Message queue. . . . . .QSYSOPR  Choices are: name or QSYSOPR
     Library . . . . . .   *LIBL
Text 'description' . . . . *BLANK
```

Once the device description has been created press F3 to return to the Main Menu.

Vary off the drive and controller. Repeat this process for the second AS/400 starting with step 3.

Auto Configuration ON

Change the configuration of the tape unit. These changes will assist in the allocate/deallocate of the tape unit.

1. Vary off tape unit, controller and tape device descriptions.

2. Issue the following commands:

```
CHGCTLTAP CTLD(TAPCTL01) ONLINE(*YES)

CHGDEVTAP DEVD(TAP01) ONLINE(*NO)
```

`(TAPCTL01), TAP01` are used as examples.

- De-allocated state. The controller will be in a varied on status and the tape device will be in a varied off status.

- Allocated state. The controller will be in an active status and the tape device will be in a varied on status.

Software

The effective use of the SCSI Switch (for AS/400®) depends on changes to the configurations and existing programs on the AS/400(s) that are connected to the tape unit. The following items are only recommendations; review them before implementing.

1. Change existing save programs and routines to issue the following commands before and after using the tape unit:

ALLOCATE: **VRYCFG** *CFGOBJ*(TAP01) +
TAPE UNIT *CFGTYPE*(*DEV) *STATUS*(*0N)

DE-ALLOCATE: **VRYCFG** *CFGOBJ*(TAP01) +
TAPE UNIT *CFGTYPE*(*DEV) *STATUS*(*0FF)

2. Monitor messages for successfully allocating the tape unit. If (as an example) System A has allocated a tape unit and System B makes a similar request of the same tape unit, System B would receive a busy message. The allocation failure will either send a message to the system operator's message queue, on System B, or the program that issued the allocation request (via VRYCFG) can monitor for the message and automate the response. Below are some of the messages that could be monitored for (these messages as of V2R3 of OS/400):

   CPF2640: 'Vary Command Not Processed'

   CPF6708 'Command Ended Due to Error'

3. Below is an example of a Control Language program that incorporates the changes discussed.

```
/* This program will perform a SAVE LIBRARY NON-SYS*/

  PGM (&TAPE)

       DCL   VAR(&TAPE) TYPE(*CHAR) LEN(10)
  VRY  VRYCFG CFG0BJ(&TAPE) CFGTYPE(*DEV) STATUS(*ON)  1

       MONMSG MSGID(CPF2640 CPF6708) EXEC(DO)          2
       DLYJOB      DLY(300)
       GOTO        VRY
       ENDDO

       SAVLIB  LIB(*NONSYS) DEV(&TAPE) ENDOPT(*UNLOAD)

       VRYCFG  CFGOBJ(&TAPE) CFGTYPE(*DEV) STATUS(*OFF)3

ENDPGM
```

Figure 4-1. Control Language Program.

This program will accept the name of the tape drive and attempt to vary the tape drive on (**1**). If the tape unit has been allocated to another system, the program will issue a delay of 5 minutes and attempt to allocate the tape unit again (**2**).

If allocation is successful, the save is processed, and upon completion the tape unit is de-allocated (**3**).

4.2 Overview of the Front Panel

Once it is installed, the SCSI Switch is primarily controlled by the AS/400 software. But, the SCSI Switch also provides manual override and lets you load new microcode into the SCSI Switch controller.

The front panel shows the status of the SCSI Switch, and controls each SCSI Switch controller board. A SCSI Switch (part number SW847A) has one front panel module, and the SCSI Switch (part number SW848A) has two front panel modules. Each module has the following indicators and controls (**Figure 4-2**).

Table 4-1. Indicators and Controls.

Indicators	Controls
Host A Active light	Manual switch
Switch Ready light	
Host B Active light	

Figure 4-2. Front Panel of the SCSI Switch.

Description of Controls and Indicators

Table 4-2. Front-Panel Indicators.

Label	State	Operating Condition
Host A Active	On	AS/400 attached to Host A port "owns" the tape drive. The AS/400 attached to Host B port is unable to access the drive until Host A releases the switch or the manual switch is moved to Host B.
Switch Ready	On	Normally on. Indicates the switch is active and ready to accept host commands.
	Off	Controller fault or target tape-drive fault. The SCSI Switch and tape drive must be power-cycled to clear the fault.
Host B Active	On	AS/400 attached to Host B port "owns" the tape drive. The AS/400 attached to Host A port is unable to access the drive until Host B releases the switch or the manual switch is moved to Host A.

Front Panel Switch

The front panel manual switch can override the software and force tape drive ownership to the other host without having to power cycle the SCSI Switch. The front panel switch always takes precedence over any host software "ownership" of the tape drive.

Table 4-2. Front-Panel Switch.

Position	Mode
Host A	Host A always "owns" the tape drive. The tape drive cannot be released by software for use by Host B.
Auto	Normal position. Either host can arbitrate for use of the tape drive. Once a hosts "owns" a tape drive it is free to release it at any time.
Host B	Host B always "owns" the tape drive. The tape drive cannot be released by software for use by Host A.

There is a six-second delay from the time the front-panel switch position is changed to the time the SCSI Switch responds to the change. This delay allows time to recover from an unintentional switch change. Modifying the position of the manual switch should be considered a last resort in an error-recovery procedure, since it can reset the SCSI Switch and tape drive, and can abnormally terminate a process using the tape drive.

Table 4-3 shows the results of changing the position of the manual switch.

Table 4-3. Results of Manual Switch Changes.

Position Change	What Happens	
Auto to Host A	Host A "owns" the tape drive regardless of the current state of the SCSI Switch.	
	If...	Then...
	• Host B had ownership or an actively executing command	• Its host interface is reset and its process is aborted.
	• A command is executing on Host B	• Host B's AS/400 process will end with an error condition.
Auto to Host B	Host B "owns" the tape drive regardless of the current state of the SCSI Switch.	
	If...	Then...
	• Host A had ownership or an actively executing command	• Its host interface is reset and its process is aborted.
	• A command is executing on Host A	• Host A's AS/400 process will end with an error condition.
Host A to Auto	If...	Then...
	• Host A has varied off the tape drive	• Host A relinquishes tape-drive ownership.
	• Host A has not varied off the tape drive.	• Host B "owns" the tape drive.
	• Ownership is relinquished	• Either host can arbitrate for the tape drive.

Table 4-3 (continued). Results of Manual Switch Changes.

Position Change	What Happens	
Host B to Auto	If... • Host B has varied off the tape drive • Host A has not varied off the tape drive • Ownership is relinquished	Then... • Host B relinquishes tape drive ownership. • Host A "owns" the drive. • Either host can arbitrate for the tape drive.
Host A to Host B	Host B is granted tape ownership; Host A's host interface is reset and Host A's process is aborted. If... A command is executing on Host A	Then... It will be driven to bus free. Host A's AS/400 process will end with an error condition.
Host B to Host A	Host A is granted tape ownership; Host B's host interface is reset and Host B's process is aborted. If... A command is executing on Host B	Then... It will be driven to bus free. Host B's AS/400 process will end with an error condition.

4.3 SCSI Switch Microcode Updates

The SCSI Switch controller may require microcode updates to incorporate new features and performance enhancements. This can be done by loading a specially formatted IPL 1/2" microcode tape into the IBM 3490E-11 or IPL 6790E tape drive attached to the SCSI Switch and following these procedures. The following instructions assume that a 6790E or 3490E is attached to the tape port of the controller.

1. Unload any tapes in the 6790E or 3490E-11 tape drive and turn off its power.

2. Power off the SCSI Switch.

3. Put the 6790E or 3490E-11 tape drive into microcode update mode. To do this:

a) Set the SCSI ID of the 6790E or 3490E tape drive to 0x0f. The ID switch is located on the back of the tape drive.

b) Change the SCSI ID by pressing either the top or bottom button until "F" is displayed in the ID window.

c) The tape drive must be power-cycled in order for a new SCSI ID to be recognized.

4. Power on the tape drive.

5. Once the tape drive displays Not Ready on its front panel, place the microcode tape in the top slot of the tape loader and press the START button. Wait for Ready to be displayed on the tape unit's front panel.

6. Power on the SCSI Switch.

7. The message "Ld uCode" is briefly displayed, then the controller attempts to read the microcode tape. If no tape is loaded, the message "Ld Tape" is displayed until a tape is loaded.

a) The SCSI Switch controller will read a special IPL header on the tape to verify that it is a switch microcode tape.

b) If this is correct, the microcode is read from tape and programmed into the controller's flash memory.

c) While reading the tape, the front panel will display Rd Tape.

8. If the microcode load was successful, the tape is unloaded and three messages are displayed at two-second intervals until the SCSI Switch is powered down:

   Ld PASSD

   Chnge ID

   Pwr Down

9. Wait for the microcode tape to unload from the tape unit.

10. Power off the tape drive.

11. Power off the SCSI Switch.

12. Set the SCSI ID of the 6790E or 3490E tape drive to ID 0x00.

a) The ID switch is located on the back of the tape drive.

b) Press either the top or bottom button until "0" is displayed in the ID window.

c) Note that the tape drive must be power cycled for a new SCSI ID to be recognized.

13. Power on the tape drive. Wait for "Ready" or "Not Ready" to appear on the tape unit's front panel.

14. Power on the SCSI Switch.

For a SCSI Switch, part number SW848A, the above procedure must be repeated for the second drive.

Interpreting the Results

Two possible results can occur:

- No errors occur during the microcode load process, and the SCSI Switch microcode should execute.
- The Microcode load process failed, and the SCSI Switch microcode will not execute.

If any error occurs while loading the microcode from tape:

- "Ld ERROR" flashes indefinitely on the tape unit's front panel until power to the SCSI Switch is turned off.
- The SCSI Switch's monitor is entered for error recovery. Refer to the **Appendix** to use the monitor.

To retry the microcode load operation without using the monitor, follow these steps:

1. Power off the SCSI Switch and wait a few seconds.
2. Power on the SCSI Switch.
3. Go to step 6 of the normal microcode load procedure.

The most common reason for microcode load failures is that an invalid microcode tape is loaded into the tape unit. Make sure that a valid microcode tape is loaded. If the switch still is unable to load microcode from a microcode tape, call for technical support. The tape could be bad or there could be an internal SCSI Switch controller fault.

5. Troubleshooting

Use the following diagram to troubleshoot installation problems.

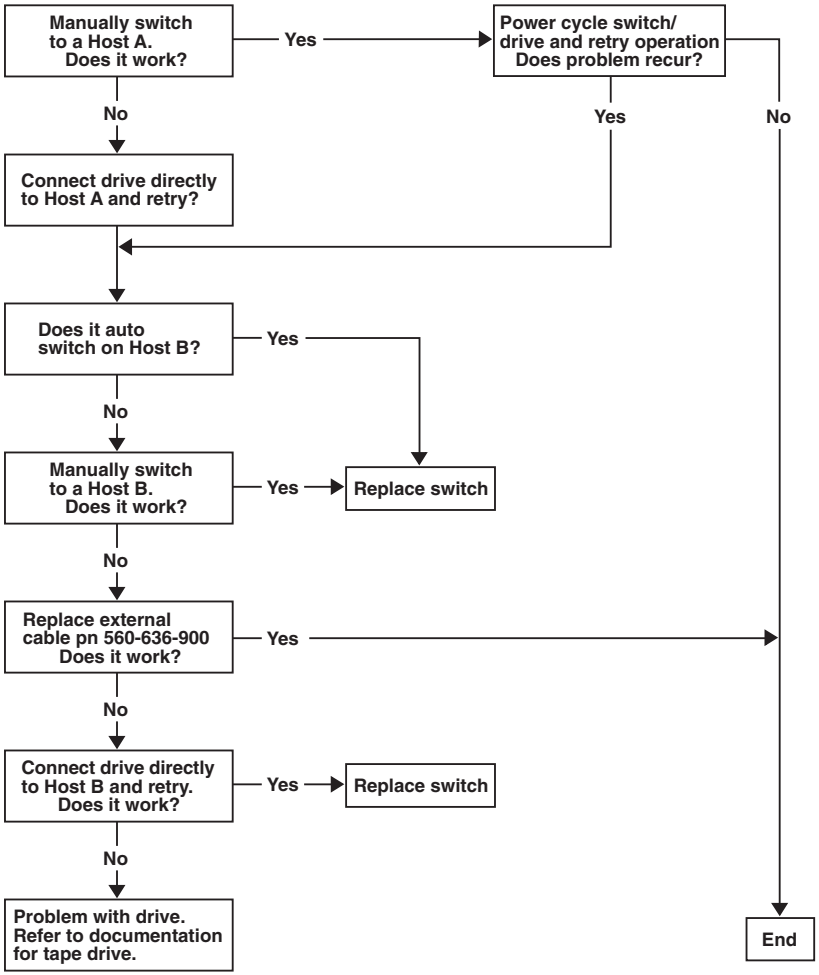

Figure 5-1. Troubleshooting Chart.

Appendix: Monitor Guide

NOTE

This appendix is intended for use by trained service personnel only.

The SCSI Switch (for AS/400®) controller contains a simple monitor for use in debugging the SCSI Switch controller and downloading new microcode. A user interfaces to the monitor by a terminal or PC connected to the serial port on the back of the switch chassis. The port is labeled SERVICE PORT. On the SCSI Switch, part number SW848A, each controller has its own service port. You must use a null-modem cable to connect the service port to the PC or terminal. Serial-port parameters are non-configurable and must be set up as follows:

Baud:	9600
Parity:	None
Handshake:	None
Data Bits:	8
Stop Bits:	1

The <esc> key protects the controller from getting spurious serial interrupts, so you must first enter <esc> to break into the monitor. Note that the SCSI Switch controller microcode is not multitasking, so when executing the monitor, no other code is executing. Do not press the <esc> key while the host is active with a tape drive.

MONITOR COMMANDS

The following pages describe all available monitor commands.

D: Dump Trace Buffer

Command: D

Syntax: D or D <index>

Purpose: Dump. This command dumps the contents of the controller's trace buffer. The controller trace buffer holds 1024 trace entries. Trace entries track events on the SCSI busses, and events that occur within the controller. The trace buffer is useful for determining what the controller was doing when it crashed, was interrupted, etc. The trace buffer is implemented as a circular buffer, so when it overflows, it overwrites the oldest trace entries. When displaying the trace buffer, the current index is printed before dumping the buffer. This index can be used to determine the last event that occurred. The trace buffer is displayed a page at a time. If an index is specified, the dump will start at that index. The monitor has range checking so if an index is specified that has no entry in it the monitor will tell the user that the index is out of range. Also, if there are no entries in the trace buffer, the monitor will print No trace entries in buffer. Any time there is an error, the user is returned to the monitor prompt.

Examples: >D

Next available index = 9e

```
0000: Target: Cmd 12h submitted
0001: Target: Ext msg received (01h) WDTR:
0002: Width = 10h
0003: Target: Ext msg received (01h) SDTR:
0004: Period = 64h
0005: Offset = 10h
0006: Target: status = 00h
0007: Target: 12h Command complete
0008: Target: Cmd 12h submitted
0009: Target: status = 00h
000a: Target: 12h Command complete
000b: Target: Cmd 12h submitted
000c: Target: status = 00h
000d: Target: 12h Command complete
000e: Target: Cmd 00h submitted
000f: Target: status = 02h
0010: Target: 00h Command complete
0011: Target: Cmd 03h submitted
0012: Target: status = 00h
0013: Target: 03h Command complete
— More —
```

```
>D 90

Next available index = 9e

0090: Target: Cmd 03h submitted
0091: Target: status = 00h
0092: Target: 03h Command complete
0093: Target: Cmd 1ah submitted
0094: Target: status = 00h
0095: Target: 1ah Command complete
0096: Target: Cmd 15h submitted
0097: Target: 02h message rejected
0098: Target: status = 00h
0099: Target: 15h Command complete
009a: Target: Cmd c0h submitted
009b: Target: 02h message rejected
009c: Target: status = 00h
009d: Target: c0h Command complete
=========
Trace End

Next available index = 9e
```

G: Go

Command: G
Syntax: G or G <address>
Purpose: Go. This command allows the user to continue executing normal code at the original monitor break point or at a specified address. The user cannot continue execution at the breakpoint if the monitor was entered because of a parity error or system panic.

Examples:

```
>G          ; Starts code execution at monitor
            ; break point.
>G c00400   ; Starts code execution at address
            ; $00c00400
```

H: Help

Command:	H
Syntax:	H
Purpose:	Help. This command will display the syntax and a brief description of all the commands that the monitor recognizes. This list is different for the sector monitor and the runtime monitor. The help screen is also printed whenever unexpected data is parsed from the monitor command line.
Examples:	`>H`

Monitor Commands:
<> indicates mandatory argument
[ ] indicates optional argument

D [index]	Dump trace buffer starting at non-zero index, or D if no index
G [addr]	Continue program execution at addr or at program interruption if no address
MR	Examine/Modify CPU32 registers
M<B|W|L>	Examine/Modify memory at addr in byte, word, or longword mode
T<1|0>	T0 disables tracing T1 clears trace buffer and enable tracing
VB [addr]	View memory in byte mode
VL	View Error Log
VR	View Microcode Revisions
VS	View System
P	Download file [9600,8,n,1] and program flash memory
RST	Soft reset controller (reloads new microcode)

Mx: Modify Byte, Longword, Register, Word

Command: MB, ML, MR, MW

Syntax:
MB <addr>
MW <addr>
ML <addr>
MR

Purpose: Modify byte, word, longword, or register. These commands allow bytes, words, or longwords to be displayed or modified. For MR, all CPU registers are displayed starting at D0. Continually hitting <cr> will display a new register until it wraps. For MB, MW, or ML, hitting <cr> will increment the address by the appropriate amount. Entering a comma will decrement the address. If the address is not mapped to a chip select the monitor will print: No chip select for address <address> and the monitor will abort the command. To change the value of a register or RAM location, enter the new value to the right of the display. All input is in Hex.

Examples:

```
>MR
D0: 00002600 10
D1: 00002600
D2: 00000001
D3: 00000006
D4: 12345678
D5: 12345678
D6: ffffffff
D7: 00000000
A0: 00800000
A1: 00c02cdc
A2: 00c031a4
A3: 00c01662
A4: 00c0165e
A5: 00000000
A6: 00000000
SSP: 00c08fd6
USP: 0081d303
SR: 00002000
PC: 00c71272
D0: 00000010
D1: 00002600
```

```
>MB C00000
00c00000: aa 12
00c00001: aa 23
00c00002: aa

>MW C00000
00c00000: 1223 4444
00c00002: aaaa DDDD
00c00004: aaaa

>ML C00000
00c00000: 4444dddd 12345678
00c00004: aaaaaaaa
```

P: Program Flash

Command: P
Syntax: P
Purpose: Program Flash. This command allows a user to download new sector 0 monitor microcode or new runtime microcode to the controller, which reprograms the controller's flash memory. The controller knows which sectors to program based on the downloaded code's file type. The microcode can be downloaded using the file transfer capability of Windows Terminal or Procomm Plus. The new microcode does not get executed until the box is power-cycled or soft-reset using the monitor's RST command. To abort a download, you must stop the file download (how this is done depends on the program), then press <esc> to tell the monitor to cancel the download. Once the download is complete, there is no way of stopping the flash from programming. Turning off power while the flash is programming can put the controller in an unrecoverable state so don't do it. There is a faster, easier method of loading new SCSI Switch controller microcode via the IPL 6790E or IBM 3490E-11 tape drive.
Examples: Done using the Procomm communications package.

At the monitor prompt, enter P.

```
>P
```

The monitor will print:

```
Clearing data buffers
Ready to download ASCII file...
```

Press the <Page Up> key. This brings up the file upload menu in Procomm. Enter an A for ASCII file transfer. Procomm will then prompt for the file name. Enter it and press return.

<Page Up>
A
Please enter file name: UCODESW.ABS

Once the file name is entered, Procomm will display a status bar at the bottom of the screen telling how many lines have been transferred and that an upload is in progress. Once all of the data has been transferred, the monitor should print:

```
File transmission successful.
Starting flash programming...
```

A series of dots will slowly be displayed. This indicates that the flash is being programmed. Do not turn off power while the dots are being displayed.

```
............
```

Once the flash is reprogrammed the monitor will display:

```
Flash reprogrammed.
New microcode effective on next power cycle.
```

To make the controller code effective, use the monitor's RST command or cycle power to the SCSI Switch.

File download can be aborted while the Procomm status bar is displayed by pressing the <esc> key twice. The monitor should print:

```
File download aborted or failed.
```

If the reprogramming failed for any reason, try it again. Depending on the error, it will usually work the second time.

RST: Reset Controller

Command:	RST
Syntax:	RST
Purpose:	Reset. This command soft-resets the SCSI Switch (for AS/400®) controller. The main purpose for this feature is to load and execute freshly downloaded microcode.
Examples:	`RST`

T: Enable / Disable Trace

Command:	T
Syntax:	T0 or T1
Purpose:	T0, Disable tracing. No events will be placed in the buffer. This increases code execution speed at the cost of no debug information. T1, Clear the trace buffer and enable tracing. This decreases code execution speed due to the overhead of placing entries in the trace buffer but gives detailed trace information.
Examples:	`T0` `T1`

VB: View Bytes

Command:	VB
Syntax:	VB <address>
Purpose:	View Bytes. This command allows the user to view bytes of memory a page at a time. The raw data is dumped to the left and decoded ASCII characters are printed to the right. None printable characters are displayed as dots. If no address is specified, memory is dumped starting at address $00000000. If no chip select is mapped to the address, the command will print No chip select for address <address> and the user will be returned to the monitor prompt. This prevents the system from hanging. Pressing any key will display the next page of memory. <esc> returns the user to the monitor prompt.

Examples:	`>VB`
	`00000000: 00 c7 ff fc 00 00 0b fc........`
	`00000008: 00 00 04 1c 00 00 04 38.......8`

```
00000010: 00 00 04 54 00 00 04 5c...T...\
00000018: 00 00 04 64 00 00 04 6c...d...l
00000020: 00 00 04 74 00 00 04 7c...t...|
00000028: 00 00 04 84 00 00 04 8c........
00000030: 00 00 04 94 00 00 04 9c........
00000038: 00 00 04 a4 00 00 04 ac........
00000040: 00 00 04 14 00 00 04 14........
00000048: 00 00 04 14 00 00 04 14........
00000050: 00 00 04 14 00 00 04 14........
00000058: 00 00 04 14 00 00 04 14........
00000060: 00 00 04 b4 00 00 07 80........
00000068: 00 00 04 c4 00 00 04 cc........
00000070: 00 00 04 d4 00 00 04 dc........
00000078: 00 00 04 e4 00 00 05 16........
00000080: 00 00 07 b4 00 00 05 2c.......,
00000088: 00 00 05 3a 00 00 05 48...:...H
00000090: 00 00 05 56 00 00 05 64...V...d
00000098: 00 00 05 72 00 00 05 80...r....
— More —

>VB C70400
00C70400: 9b 4d 00 00 00 00 c2 ca .M......
00C70408: 20 36 37 39 30 52 54 49 6790RTI
00C70410: 4d 45 00 00 3f 3c 00 0e ME..?<..
00C70418: 60 00 01 e4 3b af 00 10 `...;...
00C70420: 81 70 00 c0 26 94 2b af .p..&.+.
00C70428: 00 08 81 70 00 c0 2d 40 ...p..-@
00C70430: 3f 3c 00 01 60 00 01 c8 ?<..`...
00C70438: 3b af 00 10 81 70 00 c0 ;....p..
00C70440: 26 94 2b af 00 08 81 70 &.+....p
00C70448: 00 c0 2d 40 3f 3c 00 02 ..-@?<..
00C70450: 60 00 01 ac 3f 3c 00 03 `...?<..
00C70458: 60 00 01 a4 3f 3c 00 04 `...?<..
00C70460: 60 00 01 9c 3f 3c 00 05 `...?<..
00C70468: 60 00 01 94 3f 3c 00 06 `...?<..
00C70470: 60 00 01 8c 3f 3c 00 07 `...?<..
00C70478: 60 00 01 84 3f 3c 00 08 `...?<..
00C70480: 60 00 01 7c 3f 3c 00 09 `..|?<..
00C70488: 60 00 01 74 3f 3c 00 0a `..t?<..
00C70490: 60 00 01 6c 3f 3c 00 0b `..l?<..
00C70498: 60 00 01 64 3f 3c 00 0c `..d?<..
— More —
```

VL: View Log

Command: VL
Syntax: VL
Purpose: View Log. This command allows the user to view the internal log of the controller. The only statistics currently tracked by the log are parity errors. This will probably become more extensive with time.
Examples: `>VL`

```
Controller Error Log:
=====================
Controller Parity Err:  00000000h
Host A SCSI Parity Err: 00000000h
Host B SCSI Parity Err: 00000000h
Target SCSI Parity Err: 00000000h
```

VR: View Microcode Revisions

Command: VR
Syntax: VR
Purpose: View Microcode Revisions. This command allows the user to view the sector 0 monitor microcode revision if executing the sector 0 monitor or the sector 0 monitor and runtime code revisions if executing the runtime monitor.
Examples: `>VR`

VS: View System Dump

Command: VS
Syntax: VS
Purpose: View System Dump. This command allows the user to dump all important chip registers and microcode data structures to the screen. It is probably the most useful command for debugging. The dump is continuous with no pauses and is meant to be dumped to a log file. The user should open an output file (F1 under PCPLUS or, if using windows, open terminal and enter Receive Text File in the Transfers... menu). Data will scroll by until the monitor's > prompt is reached. The log file should be closed. Call technical support for help.
Examples: `>VS`

```
>VS

IPL ESPSW Intelligent Switch Microcode Revision Levels:
Sector Monitor Version .0001
Runtime Microcode Version A0


Ncr 720: (00400000)
===================
scntl3      = 0x1b
scntl2      = 0x80
scntl1      = 0x30
scntl0      = 0xc9
sdid  = 0x00
sxfer = 0x28
scid  = 0x20
dstat = 0x84
dsa   = 0x00c048f0
istat = 0x08
ctest0      = 0x80
temp  = 0x00c00038
dfifo = 0x00
cmd/dbc  = 0x98020000
dsp   = 0x00c00048
dsps  = 0x00000000
scratcha = 0x00000000
dcntrl      = 0x00
dien  = 0x7f
dmode = 0x80
sist1 = 0x00
sist0 = 0x20
sien1 = 0x04
sien0       = 0x8f
rspd id1 = 0x00
rspd id0 = 0x01
stest3      = 0x90
stest2      = 0x20
```

```
Ncr 720: (00600000)
===================
scntl3      = 0x1b
scntl2      = 0x80
scntl1      = 0x20
scntl0      = 0xc9
sdid  = 0x00
sxfer = 0x28
scid  = 0x20
dstat = 0x80
dsa   = 0x00c04924
istat = 0x00
ctest0      = 0x80
temp  = 0x00c00370
dfifo = 0x00
cmd/dbc  = 0x54000000
dsp   = 0x00c00350
dsps  = 0x00000210
scratcha = 0x00000000
dcntrl      = 0x00
dien  = 0x7f
dmode = 0x80
sist1 = 0x00
sist0 = 0x00
sien1 = 0x04
sien0       = 0x8f
rspd id1 = 0x00
rspd id0 = 0x01
stest3      = 0x90
stest2      = 0x20

Ncr 720: (00200000)
===================
scntl3      = 0x1b
scntl2      = 0x00
scntl1      = 0x20
scntl0      = 0xd8
sdid  = 0x01
sxfer = 0x28
scid  = 0x47
dstat = 0x80
dsa   = 0x00c0471c
istat = 0x00
```

```
ctest0      = 0x80
temp  = 0x470e0080
dfifo = 0x00
cmd/dbc  = 0x98080000
dsp   = 0x00c00980
dsps  = 0x00000000
scratcha = 0x00000002
dcntrl      = 0x00
dien  = 0x7f
dmode = 0x80
sist1 = 0x00
sist0       = 0x00
sien1 = 0x04
sien0 = 0x8f
rspd id1 = 0x00
rspd id0 = 0x80
stest3      = 0x90
stest2      = 0x20

Trace buffer:
=============

Next available index = 146

0000: Host A: command 0x08 cmd complete = 0x00
0001: Host A: command 0x11 received
0002: Host ISR  lookup index = 0x08
0003: Target: Cmd 0x11 submitted
0004: Target: command 0x11 cmd cmplt, status = 0x00
0005: Host A: command 0x11 status = 0x00
0006: Host A: command 0x11 cmd complete = 0x00
0007: Host A: command 0x01 received
0008: Host ISR  lookup index = 0x08
0009: Target: Cmd 0x01 submitted
000a: Target: command 0x01 cmd cmplt, status = 0x00
000b: Host A: command 0x01 status = 0x00
000c: Host A: command 0x01 cmd complete = 0x00
000d: Host A: command 0x00 received
000e: Host ISR  lookup index = 0x08
000f: Target: Cmd 0x00 submitted
0010: Target: command 0x00 cmd cmplt, status = 0x00
0011: Host A: command 0x00 status = 0x00
0012: Host A: command 0x00 cmd complete = 0x00
```

```
0013: Host A: command 0x15 received
0014: Host ISR  lookup index = 0x08
0015: Host A: command 0x15 data-out
0016: Target: Cmd 0x15 submitted
0017: Target: message rejected (0x02)
0018: Target: command 0x15 cmd cmplt, status = 0x00
0019: Host A: command 0x15 status = 0x00
001a: Host A: command 0x15 cmd complete = 0x00
001b: Host A: command 0x1a received
001c: Host ISR  lookup index = 0x08
001d: Host A: command 0x1a data-in
001e: Host A: command 0x1a status = 0x00
001f: Host A: command 0x1a cmd complete = 0x00
            .
            .
            .
0146: Host A: command 0x15 cmd complete = 0x00


Ior[00]:
=========
Ior Address = 0x00C0437C

Ior->tbl.cmd_cnt   = 0x00000006
Ior->tbl.cmd_bufp  = 0x00C043C0
Ior->tbl.dat_cnt   = 0x00008000
Ior->tbl.dat_bufp  = 0x00c10000
Ior->tbl.stat_cnt  = 0x00000001
Ior->tbl.stat_bufp = 0x00C043EC
Ior->tbl.msgo_cnt  = 0x00000001
Ior->tbl.msgo_bufp = 0x00C043DC
Ior->tbl.msgi_cnt  = 0x00000000
Ior->tbl.msgi_bufp = 0x00C04804
Ior->tbl.scntl3    = 0x1b
Ior->tbl.scsi_id   = 0x01
Ior->tbl.sxfer     = 0x28
Ior->next = 0x00000000
Ior->bufp = 0x00C10000
Ior->hcbp = 0x00C0404C
Ior->cmd_buf  = 0x08 0x02 0x00 0x80 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00
Ior->msgi_buf = 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
```

```
Ior->msgo_buf = 0x07 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Ior->stat_buf = 0x00
Ior->flags = 0x00

Ior[01]:
=========
Ior Address = 0x00C043F0

Ior->tbl.cmd_cnt   = 0x00000006
Ior->tbl.cmd_bufp  = 0x00C04434
Ior->tbl.dat_cnt   = 0x00008000
Ior->tbl.dat_bufp  = 0x00c18000
Ior->tbl.stat_cnt  = 0x00000001
Ior->tbl.stat_bufp = 0x00C04460
Ior->tbl.msgo_cnt  = 0x00000001
Ior->tbl.msgo_bufp = 0x00C04450
Ior->tbl.msgi_cnt  = 0x00000000
Ior->tbl.msgi_bufp = 0x00C0437C
Ior->tbl.scntl3    = 0x1b
Ior->tbl.scsi_id   = 0x01
Ior->tbl.sxfer     = 0x28
Ior->next = 0x00000000
Ior->bufp = 0x00C18000
Ior->hcbp = 0x00C0404C
Ior->cmd_buf  = 0x08 0x02 0x00 0x80 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00
Ior->msgi_buf = 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Ior->msgo_buf = 0x07 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Ior->stat_buf = 0x00
Ior->flags = 0x00

            .
            .
            .
Ior[11]:
=========
Ior Address = 0x00C04878

Ior->tbl.cmd_cnt   = 0x00000006
Ior->tbl.cmd_bufp  = 0x00C048BC
```

```
Ior->tbl.dat_cnt   = 0x00000034
Ior->tbl.dat_bufp  = 0x00c01458
Ior->tbl.stat_cnt  = 0x00000001
Ior->tbl.stat_bufp = 0x00C048E8
Ior->tbl.msgo_cnt  = 0x00000001
Ior->tbl.msgo_bufp = 0x00C048D8
Ior->tbl.msgi_cnt  = 0x00000000
Ior->tbl.msgi_bufp = 0x00C04464
Ior->tbl.scntl3    = 0x1b
Ior->tbl.scsi_id   = 0x01
Ior->tbl.sxfer     = 0x28
Ior->next = 0x00000000
Ior->bufp = 0x00C68000
Ior->hcbp = 0x00C0404C
Ior->cmd_buf  = 0x15 0x10 0x00 0x00 0x34 0x00 0x00 0x00
0x00 0x00 0x00 0x00
Ior->msgi_buf = 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Ior->msgo_buf = 0x07 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
Ior->stat_buf = 0x00
Ior->flags = 0x00

Host A Hcb:
==========
Hcbp->ncrp = 40000008p
Hcbp->iorp = 008p
Hcbp->hst_state = 0x2041
Hcbp->cmd_buf = 0x17 0x00 0x00 0x00 0x00 0x00 0x00 0x80
0x00 0x00Hcbp->status_buf = 0x00
Hcbp->retryCnt = 0x00
Hcbp->dev_state = 0x00
Hcbp->neg_state = 0x05
Hcbp->host_mask = 0x2a
Hcbp->host = A
Hcbp->sense.err_code  = 0x70
Hcbp->sense.sense_key = 0x06
Hcbp->sense.asc       = 0x29
Hcbp->sense.ascq      = 0x00
Hcbp->sense.res_cnt   = 0x00000000
Host identify byte = 80
```

```
Hcbp->sense_buf =
 0x70 0x00 0x00 0x00 0x00 0x00 0x50 0x2e
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x40 0x80 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x60 0x00 0x00 0x00 0x00 0x00 0x00
Host B Hcb:
=========
Hcbp->ncrp = 60000008p
Hcbp->iorp = 008p
Hcbp->hst_state = 0x2041
Hcbp->cmd_buf = 0x17 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00Hcbp->status_buf = 0x00
Hcbp->retryCnt = 0x00
Hcbp->dev_state = 0x00
Hcbp->neg_state = 0x05
Hcbp->host_mask = 0x15
Hcbp->host = B
Hcbp->sense.err_code  = 0x70
Hcbp->sense.sense_key = 0x06
Hcbp->sense.asc       = 0x29
Hcbp->sense.ascq      = 0x00
Hcbp->sense.res_cnt   = 0x00000000
Host identify byte = 00


Hcbp->sense_buf =
 0x70 0x00 0x02 0x00 0x00 0x00 0x00 0x2e
 0x00 0x00 0x00 0x00 0x04 0x03 0x00 0x00
 0x00 0x00 0x40 0x80 0x00 0x00 0x40 0x40
 0x24 0x43 0x00 0x00 0x00 0x20 0x00 0x80
 0x33 0xe8 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x8e 0x0f
 0x3b 0xa0 0x11 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x06 0x00 0xc0 0x43 0xc0
Target Dcb:
===========
dcb->cmd_buf = 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00
```

```
dcb->sense_buf =
 0xf0 0x00 0x80 0x00 0x00 0x80 0x00 0x2e
 0x00 0x00 0x00 0x00 0x00 0x01 0x00 0x00
 0x00 0x00 0x40 0x80 0x00 0x00 0x00 0x40
 0x24 0x00 0x00 0x11 0xd1 0x20 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x8e 0x0f
 0x3b 0xa0 0x11 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
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 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
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 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00

dcb->inq_buf =
 0x01 0x80 0x02 0x02 0x33 0x00 0x00 0x38
 0x4c 0x4d 0x53 0x20 0x20 0x20 0x20 0x20
 0x30 0x33 0x34 0x39 0x30 0x45 0x30 0x31
 0x30 0x33 0x34 0x39 0x30 0x45 0x30 0x31
 0x33 0x42 0x31 0x31 0x43 0x53 0x30 0x30
 0x30 0x30 0x30 0x30 0x30 0x30 0x31 0x31
 0x30 0x30 0x20 0x41 0xc0 0x00 0x01 0x80
```

```
dcb->mdsense_buf =
 0x00 0x00 0x10 0x08 0x80 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x02 0x0e 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x0a 0x06 0x00 0x01
 0x00 0x00 0x00 0x00 0x10 0x0e 0x00 0x00
 0x00 0x00 0x01 0x2c 0xc6 0x00 0x18 0x00
 0x00 0x00 0x01 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
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dcb->mdsel_buf =
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 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
dcb->ncr        = 0x00000000
dcb->status_buf = 0x00
dcb->retryCnt   = 0x00
dcb->dev_state  = 0x00
dcb->neg_state  = 0x05
dcb->scsi_id    = 0x01
dcb->ior        = 0x00C0471C

Controller structures:

Target Q:
=========
Queue->front = 0x00000000
Queue->rear  = 0x00000000
Queue->len   = 0x0000

Read Buffer Q:
==============
Queue->front = 0x00000000
```

```
Queue->rear  = 0x00000000
Queue->len   = 0x0000

IOR stack
=========
Stack->top = 0x00C0471C
Stack->len = 0x000c
cmd_tsk_evw   = 0x00
cmd_tsk_evn   = 0x00
cntrl.flags   = 0x00000000
cntrl.Swstate = 0x00

Controller Error Log:
=======================
Controller Parity Err:  00000000h
Host A SCSI Parity Err: 00000000h
Host B SCSI Parity Err: 00000000h
Target SCSI Parity Err: 00000000h


cntrl.mdSensebuf =
 0x00 0x00 0x10 0x08 0x80 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x02 0x0e 0x00 0x00
 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 0x00 0x0a 0x06 0x00 0x01
 0x00 0x00 0x00 0x00 0x10 0x0e 0x00 0x00
 0x00 0x00 0x01 0x2c 0xc6 0x00 0x18 0x00
 0x00 0x00 0x01 0x00 0x00 0x00 0x00 0x00
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>
```