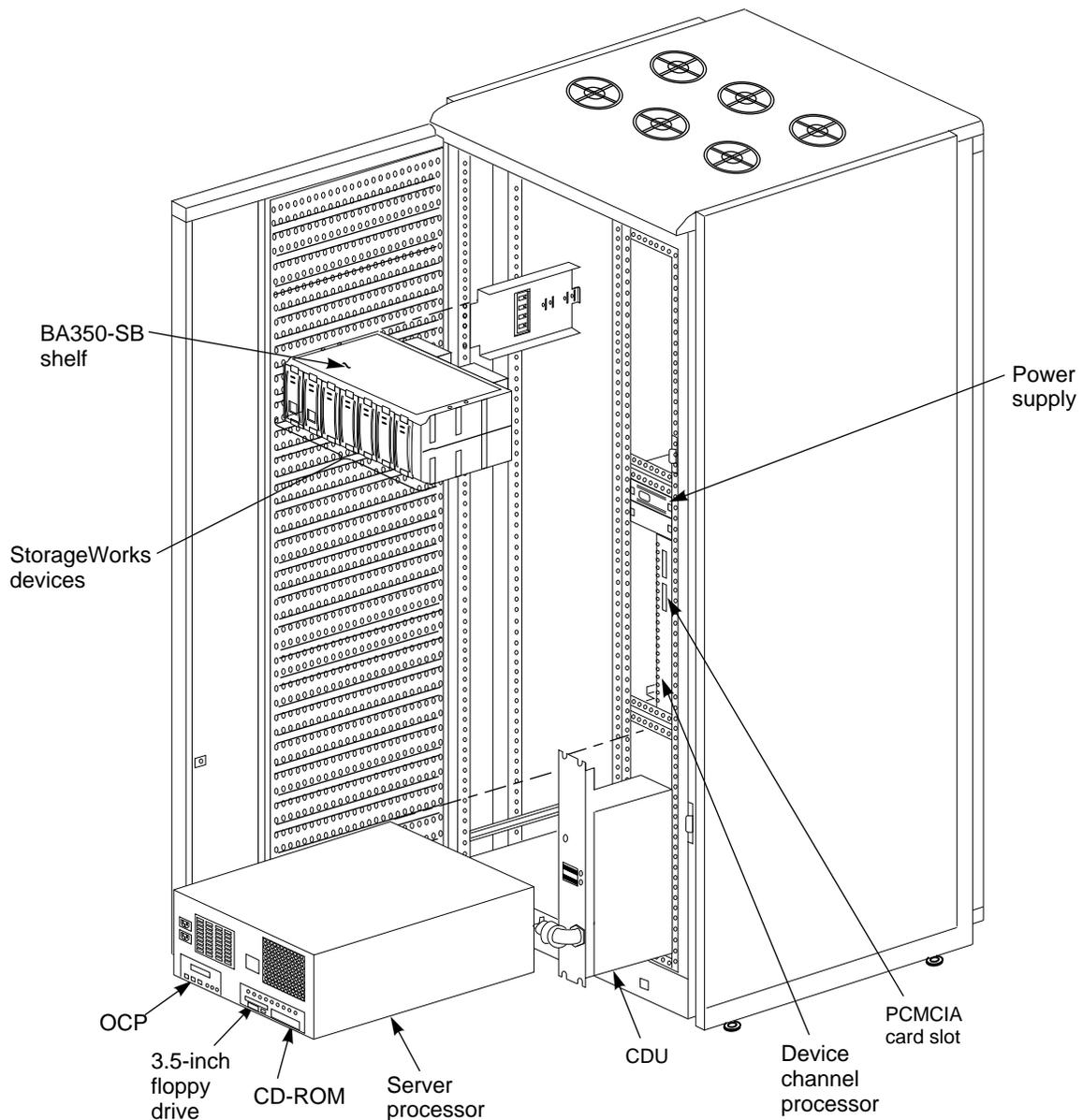


This addendum describes the basic troubleshooting process for locating problems on the Network Storage Array (see Figure 1). The focus of this addendum is the common system disk. For information about troubleshooting the Network Storage Array, refer to the *StorageWorks Solutions*, *StorageWorks FDDI Server Service Manual*.

Figure 1 Typical Network Storage Array



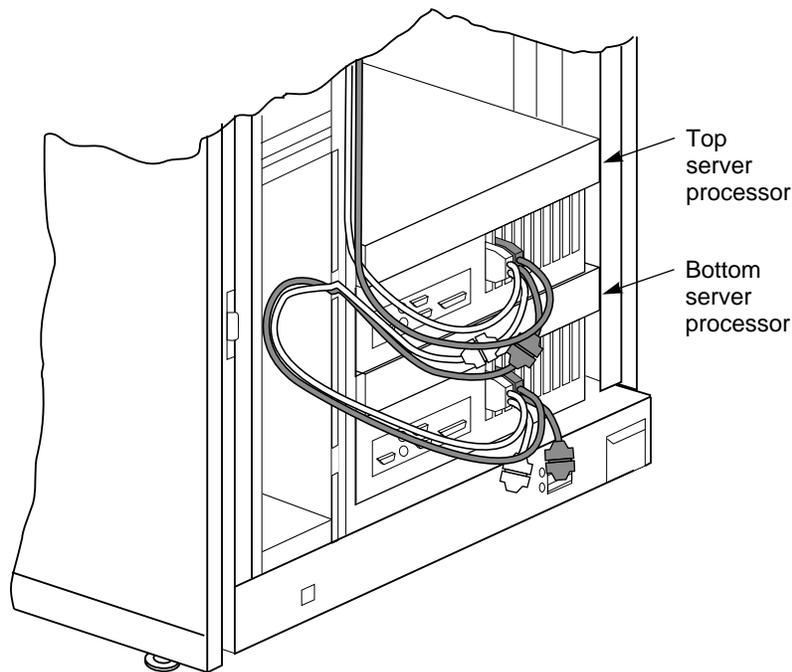
CXO-4531B-MC

1.1 Server Processor

The StorageWorks Network Storage Array's server processor combines Digital's advanced Alpha™ technology with 128 MB RAM to provide the internal performance required to handle the I/O load of network systems.

In the model SWXNA-Ax/Bx/Fx/Gx StorageWorks Network Storage Array, two server processors share the I/O load under normal circumstances. When a failure occurs, the operational server processor takes over the load of its failed partner and continues to deliver data from all devices until repair is effected. Because the server processors are separately powered and cooled, a power supply or cooling failure does not interrupt data access.

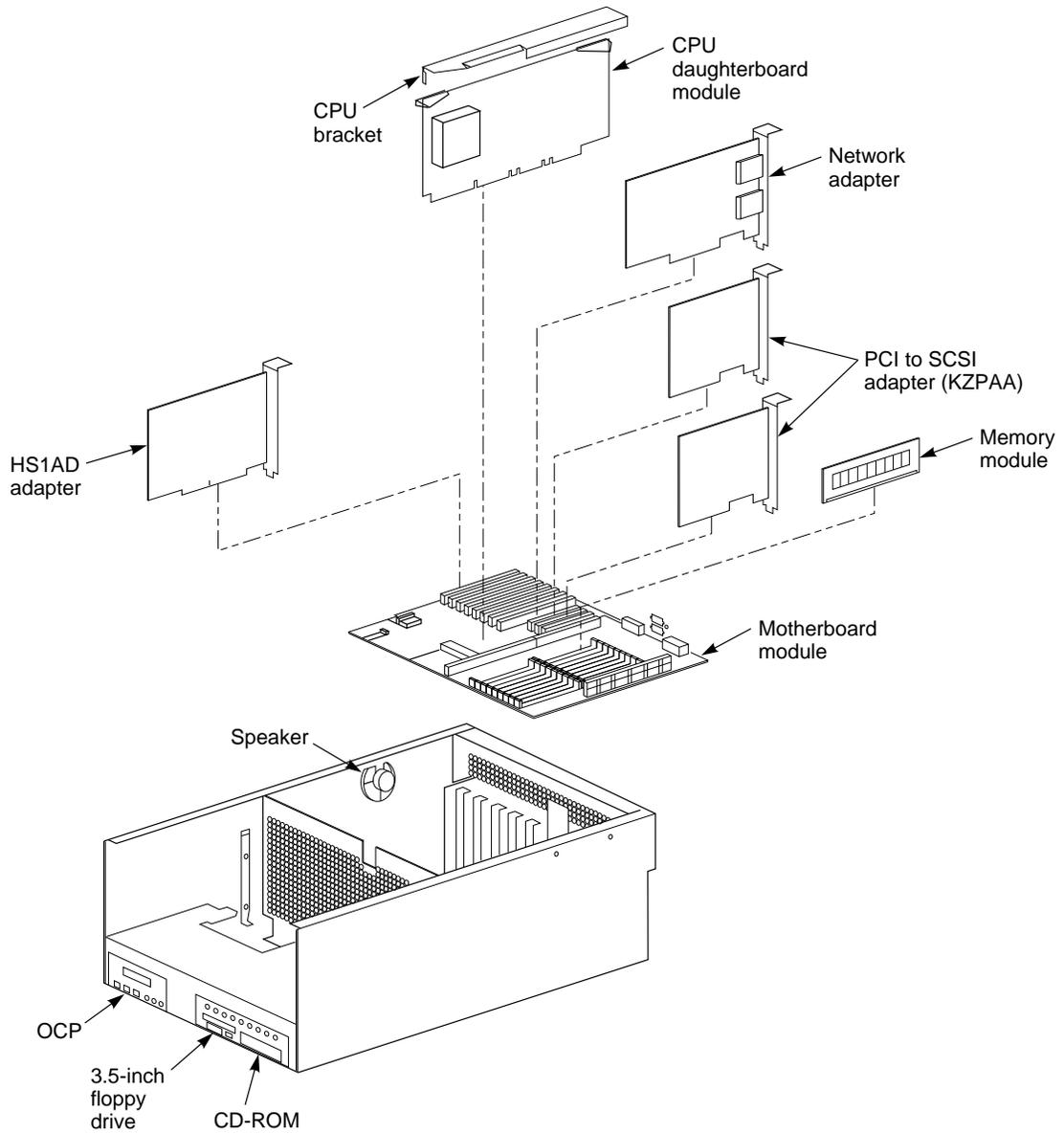
Figure 2 Server Processors



CXO-5348A-MC

The internal components of the server processor are the OCP, 3.5-inch floppy drive, CD-ROM, HS1AD adapter, CPU, network adapter, PCI-to-SCSI adapter, and memory modules (see Figure 3).

Figure 3 Server Processor Internal Components



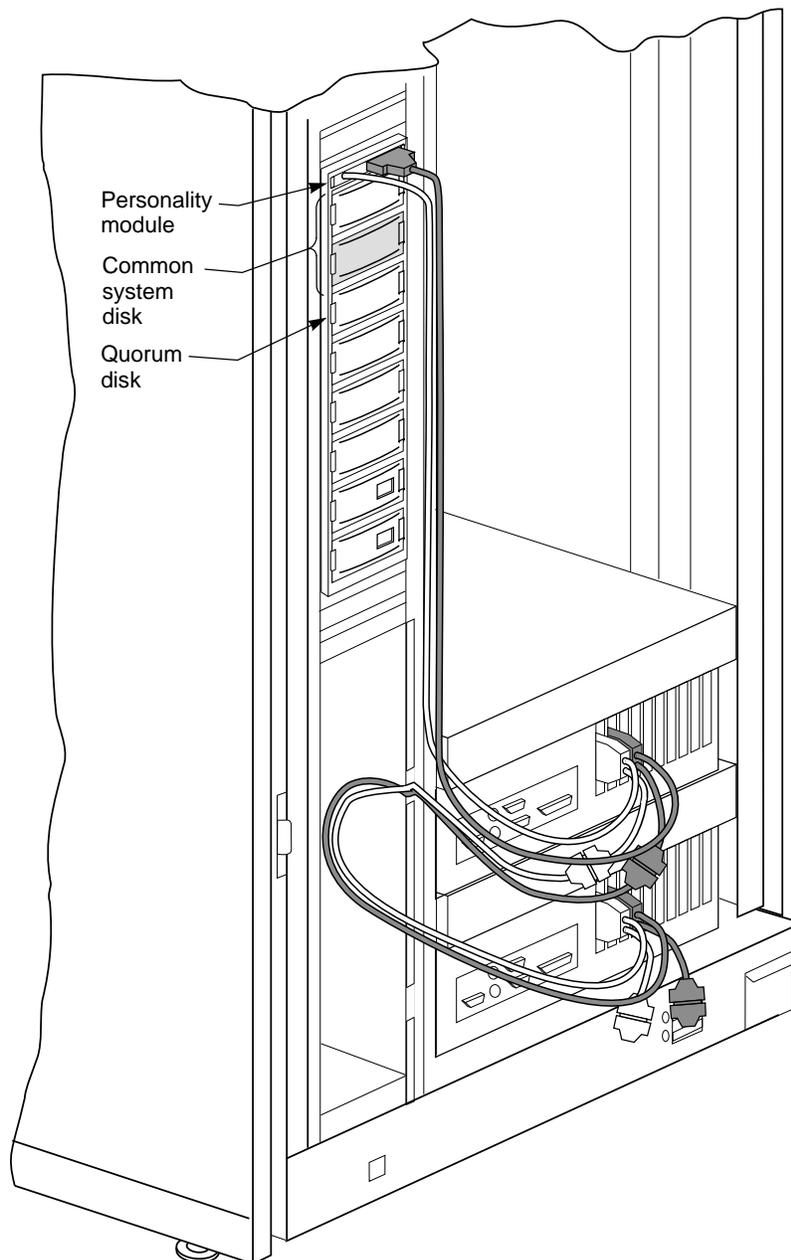
CXO-5346A-MC

1.2 Common System Disk

Two SCSI hard drives used in combination become the common system disk for *both* server processors. Each disk receives the same data from two KZPAA PCI-to-SCSI adapters in *each* server processor. With the software configured as a shadowset, the common system disk has both hardware and software dual redundancy (see Figure 4).

The common system disk contains the OpenVMS™ Alpha operating system, the Software Customization Procedure (SCP), various relevant documents, and required layered software components.

Figure 4 Common System Disk



CXO-5285A-MC

1.3 Troubleshooting

Before troubleshooting any Network Storage Array problem, check the site maintenance log for the system's service history. Be sure to ask the system manager the following questions:

- Has the system been used before, and did it work correctly?
- Have other symptoms or minor problems been observed or reported?
- Have changes to hardware or updates to firmware or software been made to the system recently?
- Is the operating system down? If you are unable to reboot it, use the console environment diagnostic tools, such as the power-up display and ROM-based diagnostics (RBDs).
- Is the operating system running normally? If you are able to use the console terminal, use the operating system environment diagnostic tools, such as error logs, crash dumps, and exercisers.

1.3.1 Troubleshooting the Network Storage Array

Use the system troubleshooting and diagnostics procedures to localize the problem to the common disk area (refer to the *StorageWorks Solutions, StorageWorks FDDI Server Service Manual*).

1.3.2 Troubleshooting the Common System Disk

After you have determined that the problem is localized to the server processor/common system disk, go to the console terminal or maintenance terminal. If a console terminal is not attached to the system, attach a maintenance terminal (refer to the *StorageWorks Solutions, StorageWorks FDDI Server Service Manual*). A maintenance terminal connection provides access to the following:

- OpenVMS error log files
- Console commands
- Error messages

1.3.3 Troubleshooting with VMS

Use the following procedure from the console DCL \$ prompt:

Note

Soft disk errors on boot are normal in a common SCSI configuration.

1. Enter the SHOW ERROR command to determine the number of errors on a device that have been reported to the error log.
2. When you find a component failure, make a note of all visual indicators (OCP, device LEDs, and error messages).
3. Extract and read host error logs.
4. The information in these error logs may indicate a KZPAA failure, in which case, shut off power to the server processor.

1.3.4 Troubleshooting with Console Firmware

If the VMS troubleshooting procedure has not resolved the problem, make sure the console terminal or maintenance terminal is in place and proceed as follows:

1. Enter `SYSS$SYSTEM:SHUTDOWN` at the `$` prompt.
When shutdown is complete the `>>>` prompt will appear.
2. Check the system configuration for the correct device parameters (node ID, device name, and so forth) by using the `SHOW DEVICE` command to show all devices on the system. You should see DKA400 and DKA500 CD-ROMs, a DKB200 quorum disk, and DKB0 and DKC100 system disks (which make up the shadowset unit DSA100). If a device does not appear, then the problem may be with the KZPAA or cables or the terminators that service the disk.

At the `>>>` prompt, enter:

```
>>> SHOW DEVICE
```

A display similar to the following appears:

```
dka400.4.0.6.0      DKA400      RRD45  1645   (1)
dkb0.0.11.0        DKB0        RZ28   442D   (2)
dkb200.2.0.1110    DKB200      RZ26L  442D   (3)
dkc100.1.0.12.0    DKC100      RZ286L 442D   (2)

dva0.0.0.0.1       DVA0
fra0.0.0.1002.0    FRA0        08-00-2B-A6-0D73
pka0.6.0.6.0       PKA0        SCSI Bus ID 6
pkb0.6.0.6.0       PKB0        SCSI Bus ID 6
pkc0.6.0.6.0       PKC0        SCSI Bus ID 6
```

3. Enter the `SHOW` command for each parameter to verify the current value (see Table 1).
Table 1 lists the manufacturing default parameters for the top and bottom server processors.

Table 1 Console Parameters and Settings

Parameter	Top Server Processor	Bottom Server Processor
boot_osflags	1, 0	0, 0
boot_reset	on	on
bootdef_dev	DKB0, DKC100	DKB0, DKC100
pka0_disconnect	1	1
pka0_fast	1	1
pka0_host_id	6	7
pkb0_disconnect	1	1
pkb0_fast	1	1
pkb0_host_id	6	7
pkc0_disconnect	1	1
pkc0_fast	1	1
pkc0_host_id	6	7
scsi_poll	on	on
console	serial	serial
os_type	OpenVMS	OpenVMS

Note

Make sure that the settings on your console match the manufacturer default. If any settings are incorrect, use SET PARAMETER to change the value to that listed in the table.

4. Errors can be intermittent. Always consider reseating components when troubleshooting. Poor connections between a component and backplane cause a variety of errors.
5. After reseating a component, see if the error indication changes. If the error remains the same, look up information for that error. If the indication changes, look up information for the newer error.
6. If reseating does not remove the error, replace the faulty module.

1.3.5 Checking for Common Hardware Problems

The system disks are mounted in a BA356-S shelf. The hardware is configured as a split-bus, with DKB0 disk connected to DKB Bus and the DKC100 connected to DKC Bus (see Figure 5 for terminator and jumper locations). For additional BA356-S shelf information, refer to the *StorageWorks Solutions, 7 Device, 16-Bit SBB Shelf (BA356-S Series) User's Guide*.

Note

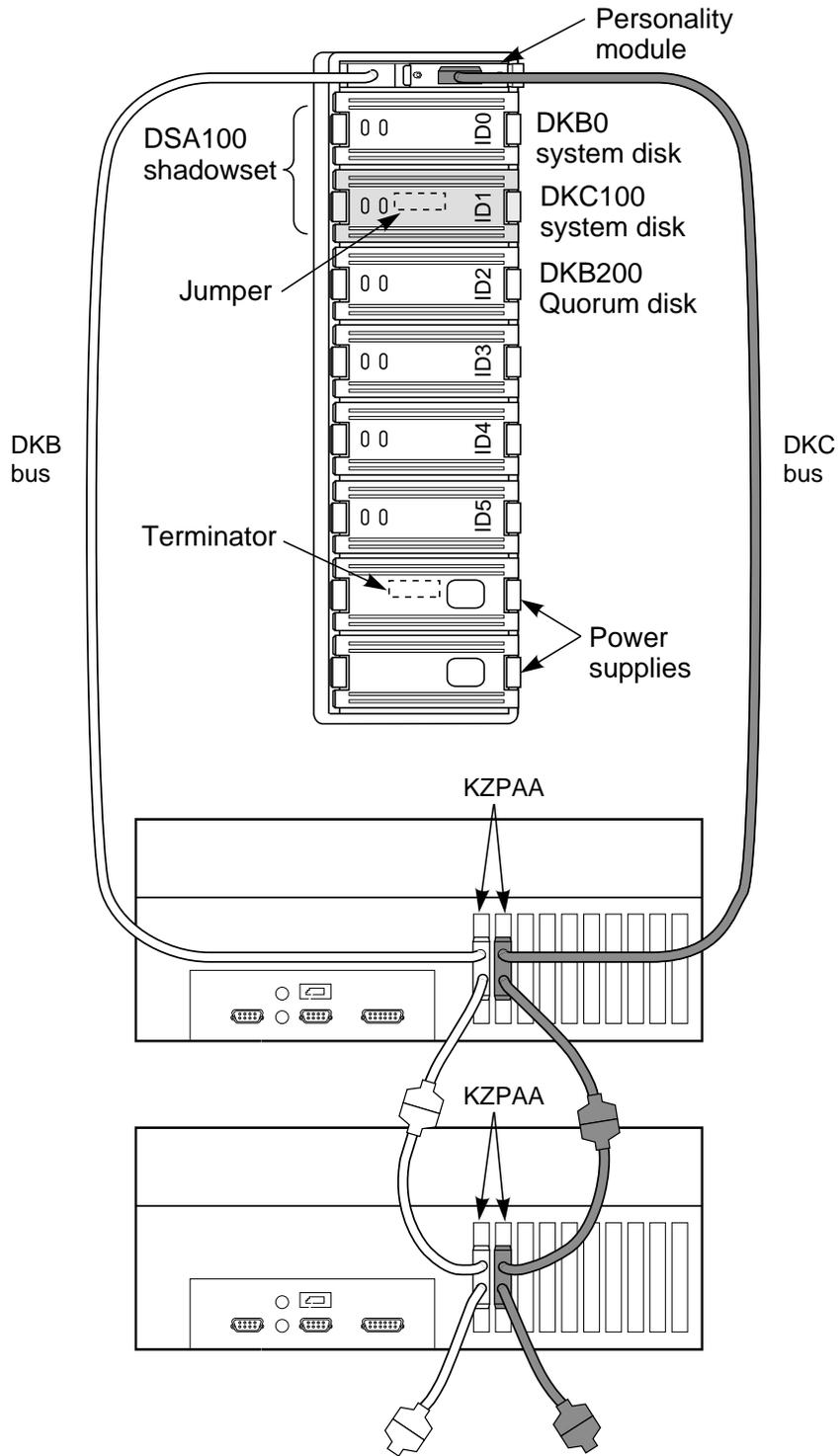
If your system does not work when received, or if you have replaced a KZPAA PCI-to-SCSI adapter, check the adapter to see if the terminator jumper is installed. If the terminator jumper is installed, remove it. The system should operate normally.

If the console terminal shows a possible problem, use the following procedure to verify the problem, then recheck the console to see if the indication has changed after effecting a repair:

Table 2 Troubleshooting

Symptom	Action
No common SCSI devices appear from the >>>prompt.	Check the power supply LEDs.
A system or quorum disk is not listed after a SHOW DEVICE command.	Check for loose or missing terminators. Tighten or replace as required. Check for loose or damaged cables or connectors. Replace or tighten as required. Change terminators from one KZPAA to the other KZPAA on the same server processor. If the problem changes, replace the terminator. Change cables from the output of one KZPAA to the other KZPAA on the same server processor. If the problem changes replace the KZPAA, replace the cable, or replace the defective drive. Change cables from the output of one KZPAA on one server processor to the output of the other KZPAA on the second server processor. If the problem changes replace the KZPAA, replace the cable, or replace the defective drive.

Figure 5 Common System Disk Interconnection



CXO-5342A-MC

1.4 Rebooting the Server Processor

After repair has been accomplished, reboot the server processor. After power up, the console terminal or maintenance terminal connected to the processor displays the >>> prompt. Enter the following command to reboot the system:

```
>>> b
```

Note

Soft disk errors on bootup are normal in a common SCSI configuration.

After the server processors have been returned to operation, check the console terminal to make sure all indications are normal.