UPGRADE INSTALLATION GUIDE

MODEL 100 AND MODEL 150 WORKSTATIONS

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December 1983

CONTENTS

UPGRADE OVERVIEW

1. Use "tar" to back up your disk(s).
2. Install new Sun 2 printed circuit boards.
3. Reroute cables and change switch settings on disk drives (Xylogics 440 upgrade only).
4. Power on and self test the workstation.
5. Reformat disk(s).
6. Install the new Sun Unix release.
7. Use "tar" to reload your old files.

Overview

This upgrade converts your Sun Workstation to the new Sun 2 CPU architecture and brings memory boards to latest revision level. It also replaces the 2-board Xylogics 440 disk controller found in some workstations with the single-board Xylogics 450 controller.

The upgrade includes new software and documentation changes to keep your Sun Workstation operating reliably and efficiently.

This upgrade does *not* replace the Interphase 2180 disk controller with the Xylogics 450. For information about upgrading an Interphase 2180 disk controller, contact your Sun Sales Representative.

The *Installation Guide* covers the following upgrades for Sun Model 100 and Model 150 workstations. Note that each upgrade package is tailored for the configuration of a specific workstation. Sun has sent you only the boards required to upgrade the specific workstation identified by serial number on the Sun packing list.

Sun 1 68000 or Sun 1.5 68010 CPU	**upgraded to**	**Sun 2 CPU**
Standard Memory Boards	**upgraded to**	**Low Power Consumption Memory Boards**
Xylogics 440 Disk Controller	**upgraded to**	**Xylogics 450 Disk Controller**

Each section of this *Installation Guide* has detailed instructions for the specific upgrades. Simply follow the numbered steps in sequence. At the left is an overview of the 7 steps necessary to complete the upgrade.

IF YOU HAVE ANY QUESTIONS WHILE MAKING THE UPGRADE, CALL SUN TECHNICAL SUPPORT AT (415) 960-1300.

Before starting, we suggest you see the Sun Microsystems *Configuration Overview* (August 15, 1983) included in this Upgrade Kit. It's a quick way to become familiar with typical printed circuit board configurations.

Tools Needed:

Phillips screwdriver
Flat-tip screwdriver
Felt-tip pen and masking tape
Sun Microsystem *Configuration Overview* (August 15, 1983)

Additional tools for Model 100 Xylogics 440 to Xylogics 450 Disk Controller upgrade:

Filament tape (included in Upgrade Kit)
Pencil and scissors
Template (included in Upgrade Kit)
Ruler

Time Required:

CPU upgrade: 1 hour
CPU and Memory Board upgrade: 1 hour
CPU, Memory Board, and Disk Controller upgrade:

Model 100U – 2 hours
Model 150U – 1 hour

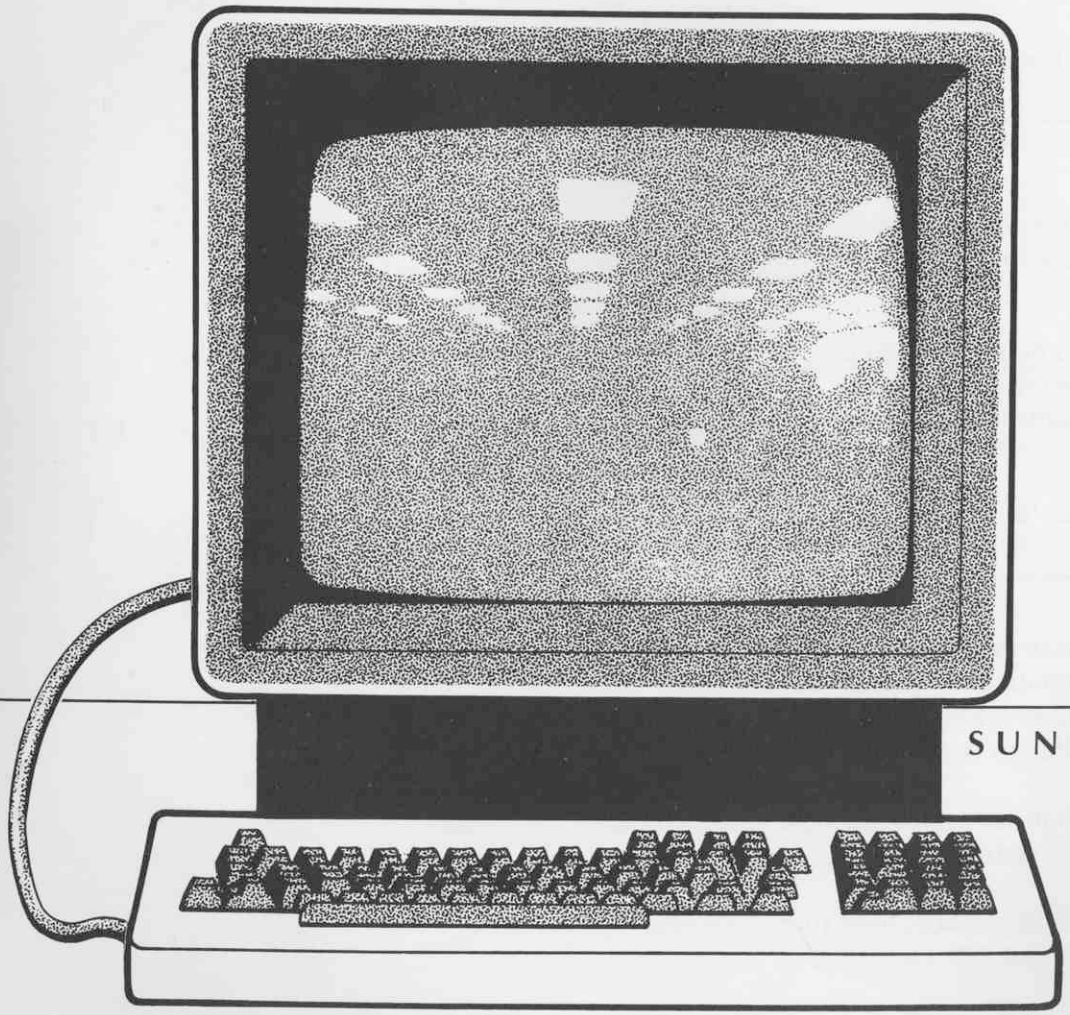
Sun Model 100 and Model 150 Workstations

The Sun Model 100 is an enclosed desktop workstation containing a 7-slot Multibus card cage.

The Sun Model 150 is a rack-mountable unit which contains a 15-slot Multibus card cage.

Sun Model 100 Workstation

Sun Model 150 Workstation



PART I

SUN MODEL 100 WORKSTATION

Section 1 - Model 100 CPU Upgrade

This procedure replaces Sun 1 or 1.5 CPU boards with the Sun 2 CPU board.

Note

The company disclaims any and all liability for personal injury and/or property damage resulting from failure to comply fully with instruction 1.3 below.

If your workstation is a diskless client linked by Ethernet to a Sun M100U or M150U fileserver, you must upgrade the fileserver to Sun 2 architecture and Rev 1.0 software for diskless operation.

Follow the procedures in this Upgrade guide as appropriate.

1.1 Use the *tar* command to make a tape backup of your system. With UNIX Version 7, you must use *tar* since *dump* formats are different for Version 7 and 4.2. Section 7 of the System Managers' Manual shipped with your upgrade gives advice about which files to save.

If the workstation is running, halt UNIX (/etc/halt for UNIX 4.2 Beta release; sync followed by setup A for Version 7 systems).

1.2 Be sure the workstation is resting securely on a flat surface, then turn it so the screen faces away from you. Allow at least 18'' clearance at the back of the unit.

1.3 **TURN OFF POWER TO THE SYSTEM AND DISCONNECT THE AC POWER CORD FROM THE REAR OF THE WORKSTATION.** Do not continue with this procedure until the system has been disconnected from its power source. Failure to do so may result in electrical shock.

Using masking tape and a felt-tip marker, label the external cables at the rear of the workstation to identify them.

Disconnect each external cable after labelling it.

Note

Throughout this upgrade, we suggest you use masking tape and a felt-tip marker to identify cables as you disconnect them. This makes it easy to reinstall the cables correctly.

1.4 Locate three Phillips screws on each side of the workstation as shown in Figure 1. Remove the screws.

1.5 Grasp the chassis handle and carefully slide the chassis from the work station.

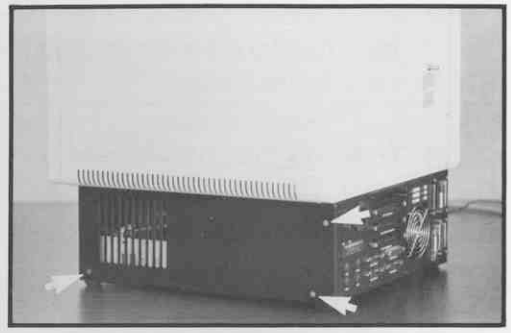
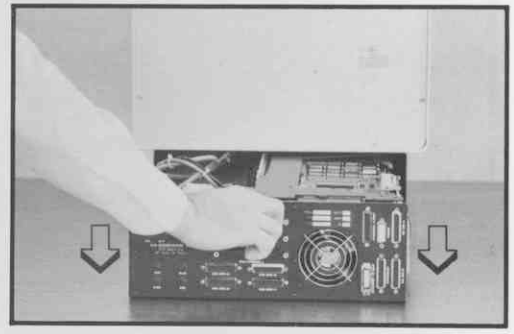


Figure 1 *Phillips Screws*



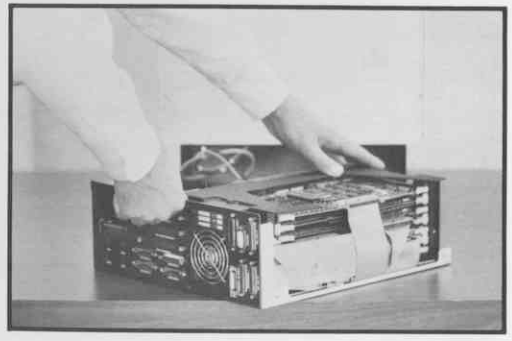


Figure 2 *Chassis Removal*

1.6 Position the chassis so the card cage is nearest you. See Figure 3 to identify two (2) restraining rails which secure the processor cards in the card cage.

Note: Some workstations may not have these restraining rails.

1.7 Disconnect all flat ribbon cables from the processor cards in the card cage as shown in Figure 3. **Use masking tape and a felt-tip marker to identify each cable (e.g., RS232, disk command, disk data, etc.) as you disconnect it.**

1.8 Unscrew the restraining rail from each edge of the card cage.

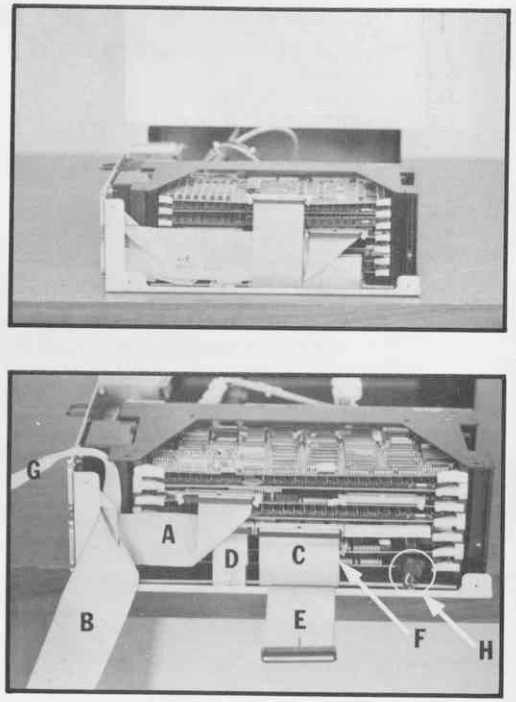


Figure 3 *Model 100 Card Cage and Ribbon Cables*

[A] *Keyboard/mouse cable*
[B] *RS232*
[C] *Disk command*
[D] *Disk data*
[E] *Long tape control cable*
[F] *Short tape control cable*
[G] *10 Mbps ethernet*

1.9 The CPU board is in the third or fourth slot from the top of the card cage. There are two large connectors on the edge of the CPU board.

The main memory board is in the slot above the CPU. If your system has two main memory boards, they're both above the CPU.

Figure 4 shows a typical card configuration.

1.10 Be sure the ribbon cables are disconnected from the cards in slots 1, 2, 3, and 4.

Remove the cards in slots 2, 3, and 4 by pulling outward on the levers on each side of the board. Then carefully slide each card out of the cage. Figure 5 shows how to do it.

1.11 Compare the boards you've removed to Figure 6 to identify the Sun 1 or 1.5 CPU board. Set the memory boards aside for the moment.

1	
2	(memory board)
3	memory board
4	CPU board
5	
6	
7	

Figure 4 *Typical CPU and Memory Board Locations*

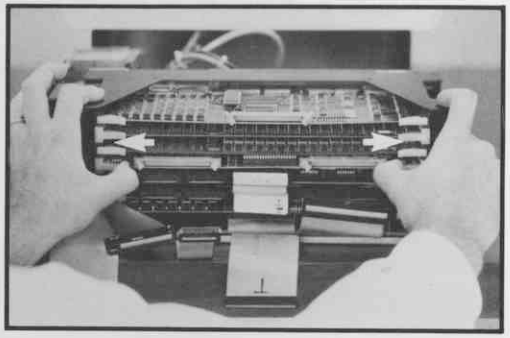


Figure 5 *Card Removal*

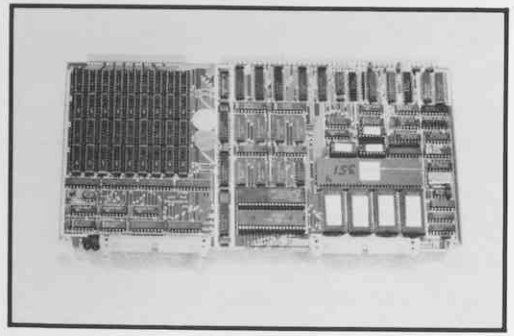


Figure 6 *Sun 1.0 and 1.5 CPU Boards*

1.12 Identify the Sun 2 CPU board received in the Upgrade Kit, as shown in Figure 7.

This board has 4 jumper plugs near its edge. Check that the jumpers are as shown in Figure 7.

1.13 Slide the Sun 2 CPU board into slot 3 in the card cage (even though your original CPU may have been in a different slot).

If necessary, gently press the center of the card up and down to fit it smoothly into the slot and seat it at the back of the card cage.

Figure 8 shows CPU board installation.

When the CPU board is completely in slot 3, press firmly inward on the levers to lock it in place. Figure 9 shows how it's done.

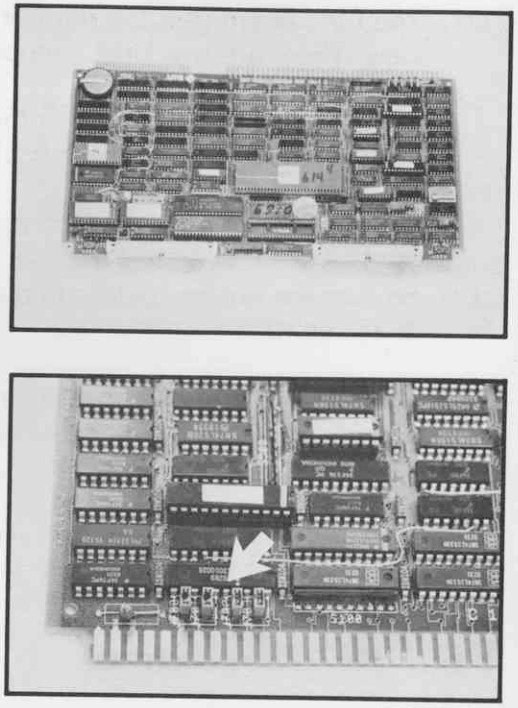


Figure 7 *Sun 2 CPU Board and Jumpers*

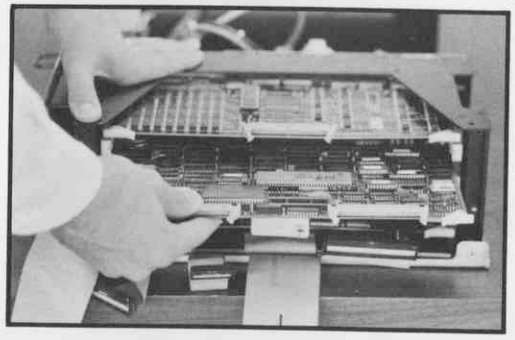


Figure 8 *Sun 2 CPU Installation*

Figure 9 *Locking the CPU Board in Place*

Chrislin Multibus Memory Boards

1.14 IF YOUR SYSTEM HAS A SUN PERIPHERAL SUBSYSTEM WITH A 1/4'' CARTRIDGE TAPE DRIVE, SKIP TO STEP 1.17.

IF YOUR SYSTEM IS A DISKLESS CLIENT WITHOUT A TAPE DRIVE SKIP TO STEP 1.21

IF YOUR SYSTEM HAS A SUN PERIPHERAL SUBSYSTEM WITH A D84 OR D169 DISK DRIVE OR A 1/2'' REEL-TO-REEL TAPE DRIVE AND DOES NOT HAVE A 1/4'' CARTRIDGE TAPE DRIVE, you must remove the Chrislin Multibus memory board(s) from the card cage.

Note

1/4" tape controller boards were used in some systems to provide Multibus memory, even though no 1/4" tape drive is present. The 1/4" tape controllers should be removed from these systems. See Figure 12 to identify the 1/4" tape controller.

Chrislin boards are normally located in slot 2 and/or slot 6 of the card cage. Figure 10 shows a Chrislin board.

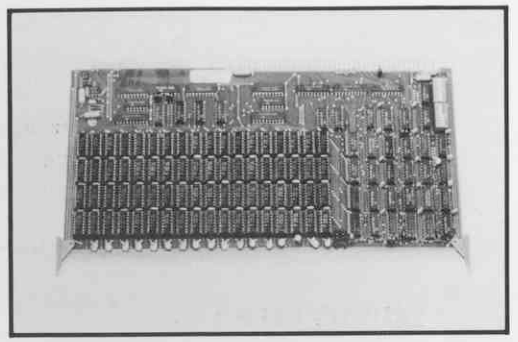


Figure 10 *Chrislin Multibus Memory Board*

1.15 Compare the board you've removed from slot 2 to Figure 10. If it's a Chrislin board, set it aside for return to Sun after the upgrade. It will NOT be used in the upgraded workstation.

1.16 Remove the board, if any, from slot 6 and compare it to Figure 10. If it's a Chrislin board, set it aside for return to Sun after the upgrade. Chrislin boards will NOT be used in the upgraded workstation.

Note

Chrislin boards or other Multibus Memory boards are NOT needed for Sun 2 operation. The upgraded workstation will not operate with Chrislin board(s) installed.

SKIP TO STEP 1.21

Tape Controllers

1.17 IF YOUR SYSTEM HAS A 1/4'' INCH TAPE CARTRIDGE DRIVE, locate the Sun 1/4'' tape controller board. This board is most likely in slot 1 or slot 6 of the card cage, as shown in Figure 11.

1.18 If the ribbon cable is still connected to the tape controller board, label and disconnect it. Remove the tape controller board and identify it as shown in Figure 12.

1.19 Locate the switches at the position marked U50 on the 1/4'' tape controller board. Set the switches OFF or OPEN as shown in Figure 13 to disable the 1/4 MB of Multibus memory located on the board.

The 1/4 MB memory MUST BE DISABLED for the workstation to operate.

1.20 Slide the 1/4'' tape controller card into its original position (slot 1 or slot 6) in the card cage. When the card is seated at the back of the cage, press inward on the levers to lock the card in place.

1	Slot 1
2	
3	
4	or
5	
6	Slot 6
7	

Figure 11 *Typical 1/4" Tape Controller Location*

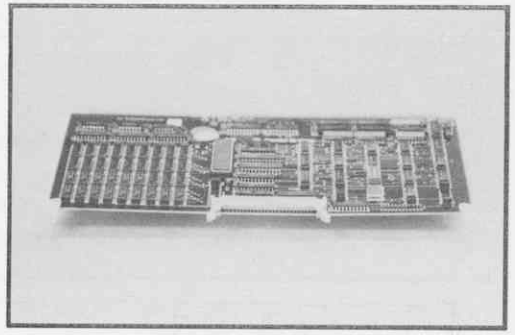


Figure 12 *1/4" Tape Controller Board*

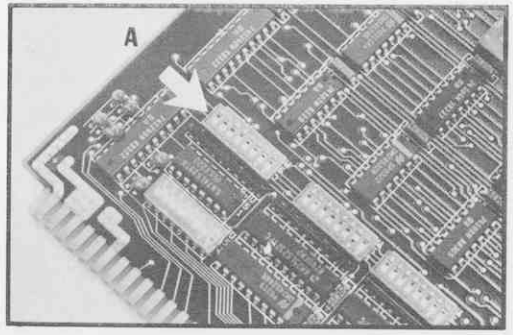


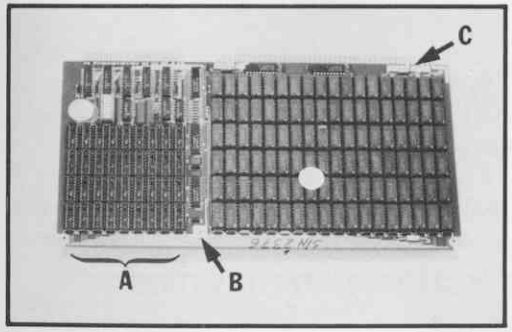
Figure 13 *Tape Controller U50 Switches*

[A] *All switches at U50 should be off or open*

1.21 Compare the main memory boards you've removed from slots 2 and 3 to the boards in Figure 14.

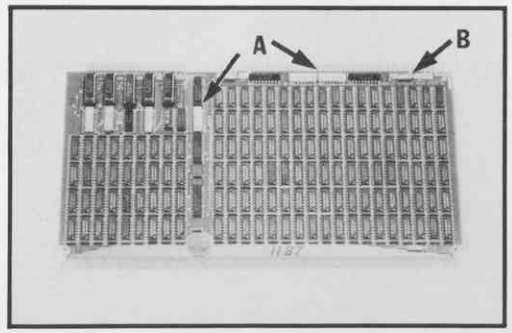
The memory boards are either standard or low power boards, depending on their power consumption in normal use. When used with the Sun 2 CPU, the low power memory boards draw less power than standard boards.

1.22 If your system has STANDARD memory board(s), you should have received low power boards to replace them. If you did not receive low power boards to replace your standard boards, contact Sun Field Support. Skip Step 1.23 and **CONTINUE WITH SECTION 2.** You'll return all standard memory boards to Sun after the upgrade.



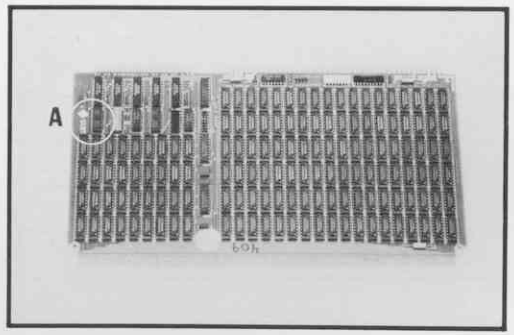
Standard Rev B 768k or Standard Rev B 1mB

[A] *768k board has no RAM chips in this area*
[B] *SUN logo*
[C] *Rev B shown here*



Standard Rev C 1mB

[A] *White resistor packs in 3 locations*
[B] *Rev C shown here under "SUN Microsystems"*



Low Power 1mB

[A] *SUN logo*

Figure 14 *Main Memory Boards*

1.23 If your system has one LOW POWER memory board, replace it in slot 4 of the card cage and latch it in place.

If your system has two LOW POWER memory boards, replace one in slot 4 and the other in slot 2. Latch each board in place.

Figure 15 shows the upgraded CPU and memory board configuration.

SKIP SECTION 2 AND CONTINUE WITH SECTION 3.

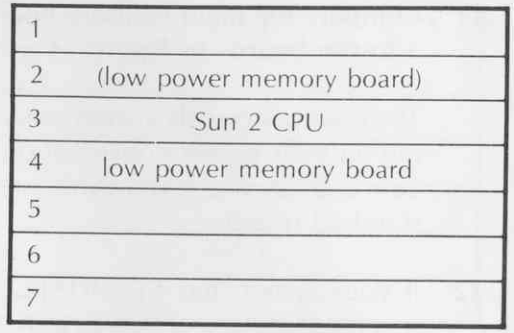


Figure 15 *Upgraded Memory Board(s) and CPU Configuration*

Section 2 - Model 100 Memory Board Upgrade

This procedure replaces standard main memory board(s) with low power board(s) included in the Upgrade Kit. Complete Section 1 before starting this upgrade.

2.1 See Figure 14 to identify the LOW POWER 1MB memory board(s) included in your Upgrade Kit. If your system has 2 MBs of main memory, the Upgrade Kit should include two low power memory boards.

2.2 Note the switches at the position marked U506 on the low power memory board(s) in Figure 16.

For the first 1 mB of main memory, set switch 1 at U506 ON and all the others OFF. Then insert this memory board in slot 4 of the card cage and lock it in place.

If you're installing a second memory board, set switch 2 at U506 on the second board ON and all the others OFF. Insert the second memory board in slot 2 of the card cage and lock it in place.

2.3 Figure 17 shows the upgraded memory board configuration:

CONTINUE WITH SECTION 3.

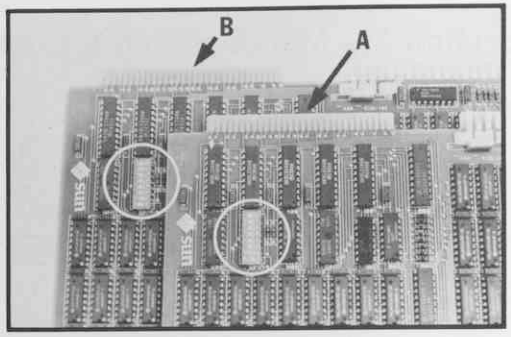


Figure 16 *Switch Settings - Low Power 1mB Memory Boards*

[A] *1st Main Memory Board: U506 Switch 1 ON, all other OFF*

[B] *Optional 2nd Main Memory Board: U506 Switch 2 ON, all others OFF*

1	
2	(low power memory board)
3	Sun 2 CPU
4	low power memory board
5	
6	
7	

Figure 17 *Upgraded Memory Board and CPU Configuration*

Section 3 - Model 100 Disk Controller Check

The present upgrade replaces the dual-board Xylogics 440 disk controller with the single-board Xylogics 450. It does *not* replace Xylogics 450 or Interphase 2180 disk controllers.

Note

If you wish to replace an Interphase 2180 disk controller with a Xylogics 450, contact your Sun Sales representative for details about the return-to-factory upgrade program.

In this section you'll verify whether your system's disk controller needs to be upgraded.

3.1 Systems which use a disk controller have a disk/tape backplate at the rear of the workstation, as shown in Figure 18.

IF YOUR SYSTEM HAS A BLANK DISK/TAPE BACKPLATE WITH NO CONNECTORS IN THE AREA SHOWN IN FIGURE 18, **SKIP DIRECTLY TO SECTION 5.**

IF YOUR SYSTEM HAS A DISK/TAPE BACKPLATE WITH CONNECTORS FOR "DISK DATA," "DISK COMMAND," "TAPE COMMAND," ETC., **CONTINUE WITH THIS SECTION.**

3.2 If your system uses a disk controller, you'll need to identify the disk controller board. The Interphase 2180 and Xylogics 450 are single boards. The Xylogics 440 is a dual-board controller with a ribbon cable connecting the boards. The disk controller is typically in slot 4, 5, or 6 of the card cage.

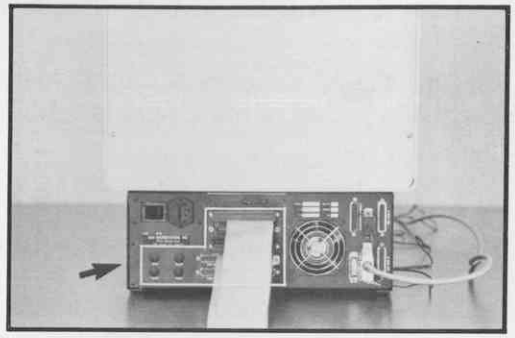


Figure 18 *Disk/Tape Backplate*

1	
2	
3	
4	Slot 4,
5	5,
6	or 6
7	

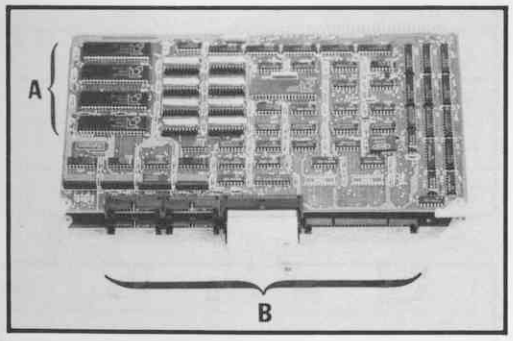
Figure 19 *Typical Disk Controller Locations*

3.3 Remove the boards in slots 5 and 6. Compare these boards and any others you've already removed from the card cage to Figure 20 until you've identified the disk controller board.

The Xylogics 440 has two boards connected by a short ribbon cable (which you may already have removed). Remove both boards at the same time.

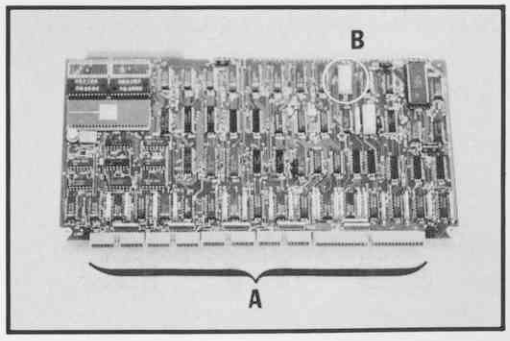
3.4 If you determine that your system does NOT have a disk controller, replace the boards and **CONTINUE WITH SECTION 5.**

If your disk controller is a dual-board Xylogics 440, skip the rest of this Section and **CONTINUE WITH SECTION 4.**



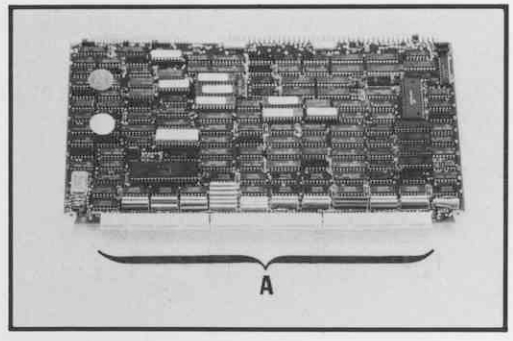
Xylogics 440

[A] *dual boards*
[B] *black connectors*



Interphase 2180

[A] *blue connectors*
[B] *S2 switches*



Xylogics 450

[A] *white connectors*

Figure 20 *Disk Controller Boards*

3.5 Figure 21 shows a 1/2" tape controller.

If your disk controller is an Interphase 2180 or Xylogics 450 AND your system has a 1/2" tape controller as shown in Figure 21, follow this sequence:

(1) Locate the switches at S2 on the Interphase 2180 board (see Figure 20. Be sure that ONLY switch 3 is ON.

(2) Install the disk controller in slot 6 of the card cage.

(3) Install the 1/2" tape controller in slot 5.

3.6 If your disk controller is an **Interphase 2180** or **Xylogics 450** and you do NOT have a 1/2" tape controller, install the disk controller in slot 5.

BEFORE INSTALLING AN INTERPHASE 2180, locate the switches at S2 on the board (see Figure 20). Be sure that ONLY switch 3 is ON.

3.7 The new disk controller location is slot 5 or 6 as shown in Figure 22.

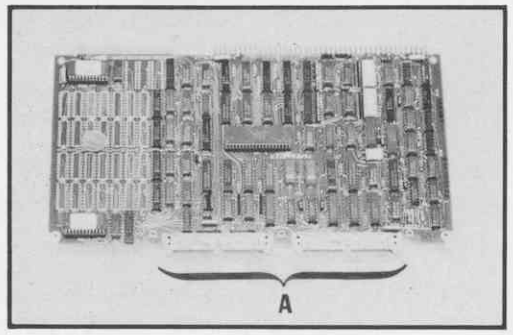


Figure 21 *1/2" Tape Controller*

[A] *dual connectors*

1	
2	
3	
4	
5	disk controller
6	
7	

– or –

1	
2	
3	
4	
5	1/2" tape controller
6	disk controller
7	

Figure 22 *New Disk Controller Locations*

3.8 Reconnect the disk controller and tape cables.

Replace any other boards you removed from the card cage in Step 3.3 and reconnect their cables. Be sure all boards are latched in place.

If you're uncertain about board configurations and cable connections, see Figure 68 for typical locations.

3.9 If your system had restraining rails at the left and right edges of the card cage, install them as shown in Figure 23.

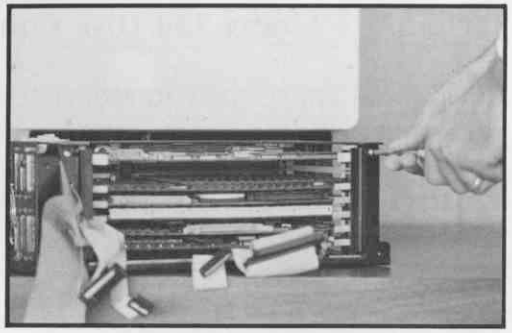


Figure 23 *Restraining Rail Installation*

Section 4 - Model 100 Disk Controller Upgrade

This Section applies only to Model 100 workstations with Xylogics 440 disk controllers.

The following procedure replaces the dual-board Xylogics 440 disk controller with the single-board Xylogics 450. It also reroutes internal cables for the upgrade configuration.

Note

1. You must reformat your system disk for operation with the Xylogics 450. See the System Manager's Manual included in your documentation.

2. Replacing the dual-board Xylogics 440 with the single-board Xylogics 450 will give you an additional empty slot in the card cage. Power supply limitations may preclude using this slot. See page 5 of the August 15, 1983, Configuration Overview for details.

Follow this procedure if you've identified your disk controller in Section 3 as a Xylogics 440. You'll return the Xylogics 440 boards to Sun after the upgrade.

4.1 Locate the Xylogics 450 disk controller included in your Upgrade Kit, as shown in Figure 24. If you did not receive a Xylogics 450, contact Sun Field Support at (415) 960-1300 immediately.

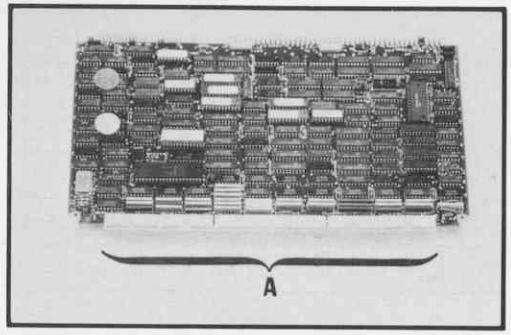


Figure 24 *Xylogics 450 Disk Controller*

[A] *white connectors*

4.2 If your system has a 1/2'' tape controller (see Figure 21), install the Xylogics 450 board in slot 6 of the card cage. Install the 1/2'' tape controller in slot 5.

If your system does NOT have a 1/2'' tape controller, install the Xylogics 450 board in slot 5.

Figure 25 shows the new disk controller location.

4.3 Be sure all boards are latched in place in the card cage.

The rest of this Section involves cable routings.

1	
2	
3	
4	
5	1/2'' tape controller
6	disk controller
7	

1	
2	
3	
4	
5	disk controller
6	
7	

Figure 25 *New Disk Controller Locations*

4.4 Disconnect all cables from the boards in the card cage, if you've not already done so. Use masking tape and a felt-tip marker to identify each cable (e.g., disk data, disk command, etc.) as you disconnect it.

Be sure to disconnect the round video cable from the right side of the video board in slot 7.

Note

If the cables in your unit are positioned OVER the card cage, DO NOT CONTINUE WITH THIS UPGRADE. You'll need additional hardware to reroute the cables.

Contact Sun Field Support to arrange an upgrade.

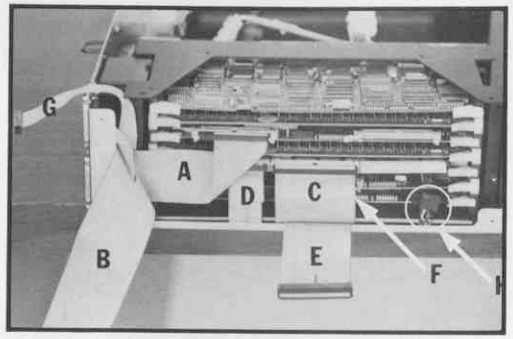


Figure 26 *Cable Connectors*

[A] *Keyboard/mouse cable*
[B] *RS232*
[C] *Disk command*
[D] *Disk data*
[E] *Long tape control cable*
[F] *Short tape control cable (hidden)*
[G] *10 Mbps Ethernet*
[H] *Video*

4.5 Figure 27 shows the large, plastic 12-wire DC connector, **located in back of the card cage.**

Use a flat-tip screwdriver to pry this connector open while pressing the clips on its sides. Disconnect both halves of the connector from each other.

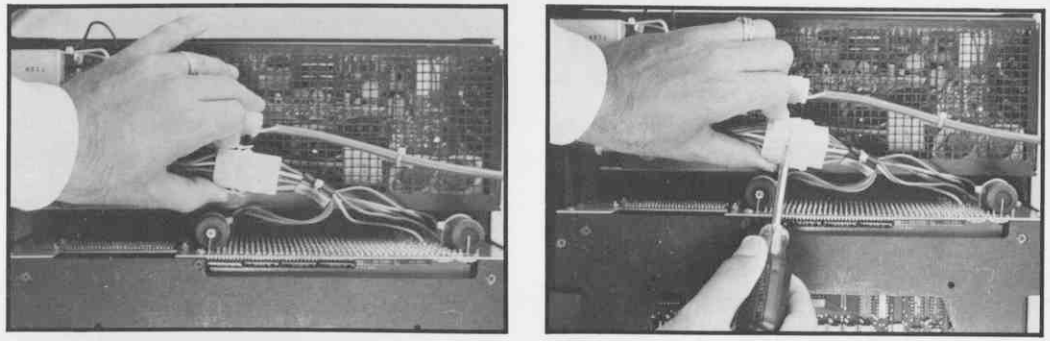


Figure 27 *DC Connectors*

Card Cage Removal

4.6 Position the chassis as shown in Figure 28. Be careful that it doesn't tip over the edge of your work surface.

Four (4) Phillips screws on the underside of the chassis fasten it to the card cage.

Remove two (2) Phillips screws at the front edge of the chassis.

4.7 Rotate the chassis to access the remaining two (2) Phillips screws. Remove these screws.

4.8 Carefully lift the card cage free of the chassis.

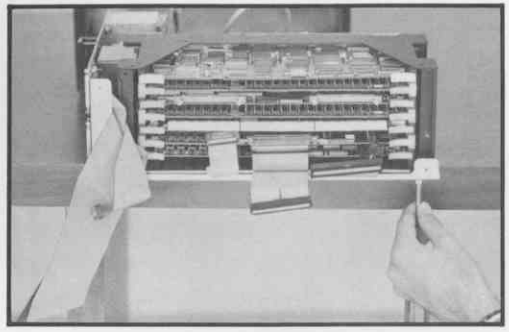


Figure 28 *Screw Removal - Front Edge of Chassis*

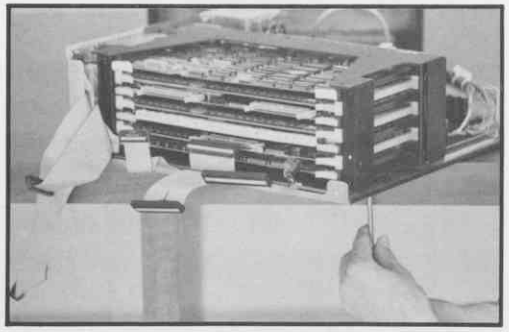


Figure 29 *Screw Removal - Right Underside of Chassis*

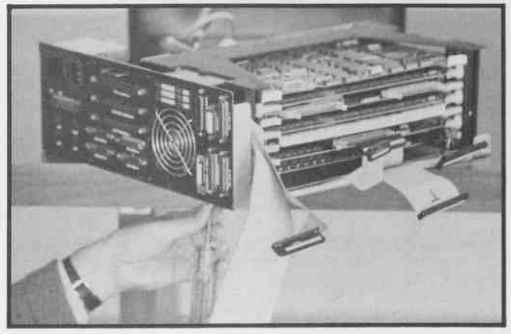


Figure 30 *Screw Removal - Left Underside of Chassis*

Figure 31 *Card Cage Removal*

4.9 You'll see a thin copper plate (usually notched as shown in Figure 32) on the bottom of the chassis. Lift this plate out of the chassis.

Note

If your system does not have this copper plate, DO NOT CONTINUE WITH THE UPGRADE.

Contact Sun Field Support to arrange an upgrade.

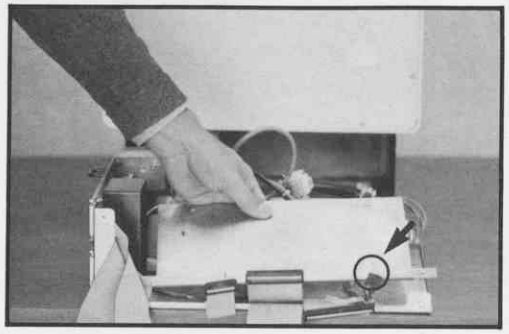


Figure 32 *Copper Plate Removal*

4.10 The ribbon cables should now be visible as in Figure 33.

These cables are in two groups. If you've not already done so, label the cables with masking tape and a felt-tip marker as you identify them (disk command, disk data, etc.).

The first group of cables includes:

(1) disk command cable. This is the widest cable.

(2) tape cables. One of these cables is longer than the other.

(1) disk data cable. This is the narrowest cable running from the disk/tape backplate.

The second group of cables runs from the RS232, keyboard/mouse, and Ethernet connectors.

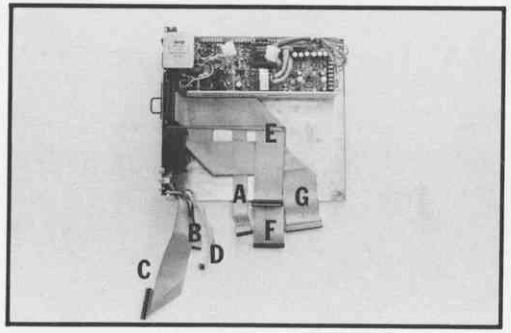


Figure 33 *Ribbon Cables*

[A] *Disk data cable*
[B] *Keyboard/mouse*
[C] *RS232*
[D] *10 Mbps Ethernet cable*
[E] *Short tape cable*
[F] *Long tape cable*
[G] *Disk command cable*

4.11 Lift the cables out of the chassis and fold them to one side as shown in Figure 34.

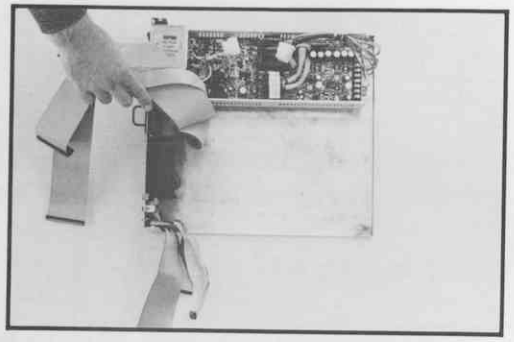


Figure 34 *Cable Removal*

Cable Routing

4.12 Cut template A from the template sheet. Position it against the LEFT side of the chassis bottom, as shown below:

4.13 Trace the outline of Template A on the chassis and label the line **A**. This is the path for the disk data cable.

4.14 Cut template B from the template sheet. Position it against the LEFT edge of the chassis and trace its outline.

Label this line **B**. This is the path of the disk command cable.

Move template B to the RIGHT side of the chassis and trace the cutout notch on the template (this is the video cable notch).

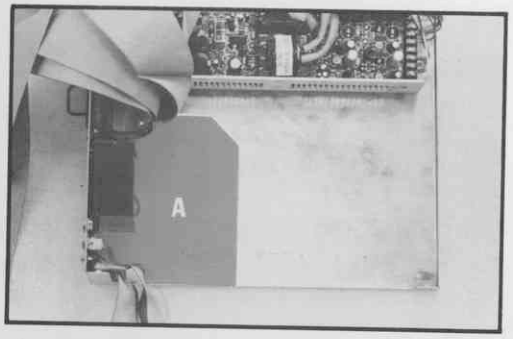


Figure 35 *Template A Tracing - Disk Data Cable*

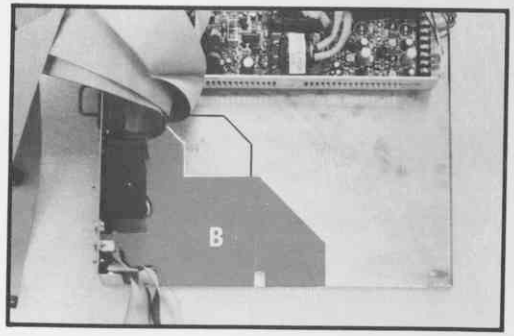
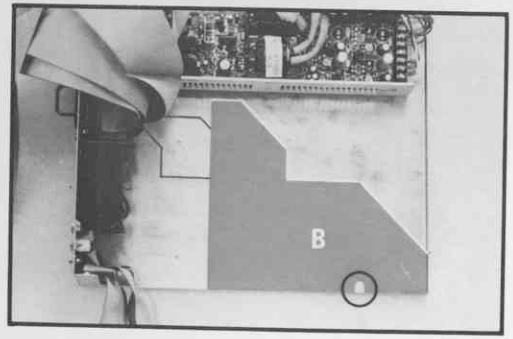


Figure 36 *Template B Tracing - Disk Command Cable*



Template B Tracing - Video Cable Notch

4.15 FOR SYSTEMS WITH 1/4'' TAPE CONTROLLER, cut template C from the template sheet (Figure 12 shows a 1/4'' tape controller board if you're uncertain).

Position template C against the LEFT side of the chassis and trace its outline. Label the line **C**. **You will not use templates D and E**.

Skip to Step 4.17

4.16 FOR SYSTEMS WITH 1/2'' TAPE CONTROLLER, cut templates D and E from the template sheet (Figure 21 shows a 1/2'' tape controller board if you're uncertain).

Position template D against the RIGHT side of the chassis as shown in Figure 38.

Trace template D and label the outline **D**.

Position template E against the RIGHT side of the chassis and trace its outline. Label this line **E**. **You will not use template C**.

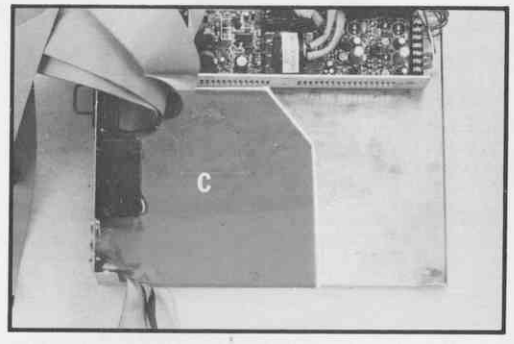


Figure 37 *Template C Tracing - 1/4" Tape Cables*

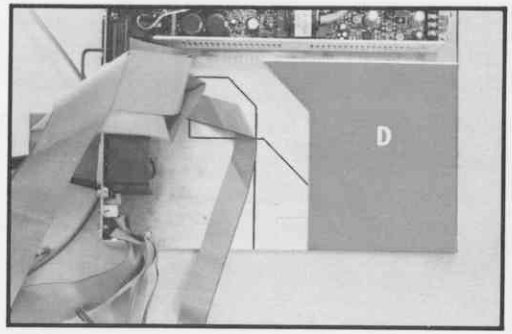


Figure 38 *Template D Tracing - Short 1/2" Tape Cable*

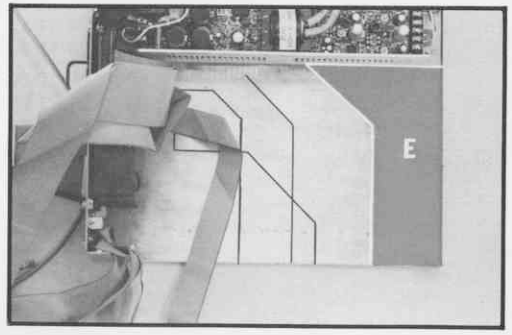


Figure 39 *Template E Tracing - Long 1/2" Tape Cable*

4.17 This chart summarizes cable routings on the chassis bottom:

Template	Cable Routing
A	Disk data cable
B	Disk command cable and video cable notch
C	(2) Tape control cables (1/4" tape system)
D	Short tape control cable (1/2" tape system)
E	Long tape control cable (1/2" tape system)

4.18 When you've completed the tracings, the bottom of the chassis should look like Figure 40 or 41.

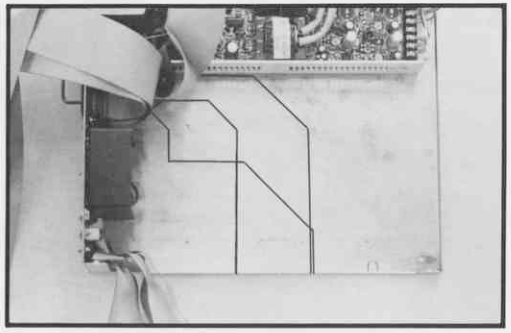


Figure 40 *Completed Tracings A, B, C (1/4" Tape Controller System)*

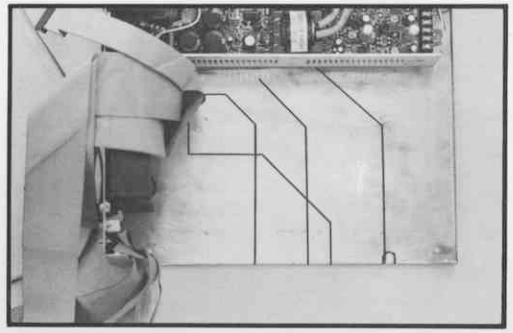


Figure 41 *Completed Tracings A, B, D, E (1/2" Tape Controller System)*

Cable Installation

4.19 Identify the narrow disk data cable and position it along the line traced with Template A.

Press the disk data cable flat against the back panel of the workstation as in Figure 42. This provides clearance for the card cage assembly when you reinstall it.

Use filament tape to tape the disk data cable along trace A. The cable should extend about 5" over the edge of the chassis as in Figure 43.

Note

Use the correct routing technique shown in Figure 42 for all cables to provide adequate clearance for the card cage.

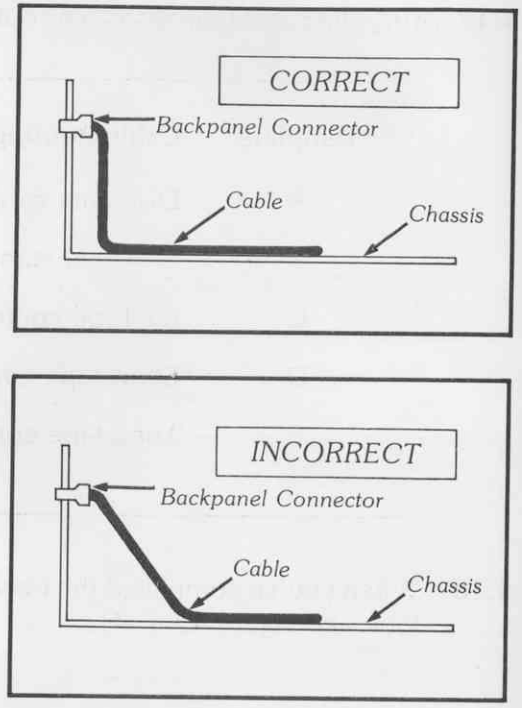


Figure 42 *Cable Routing (Side View)*

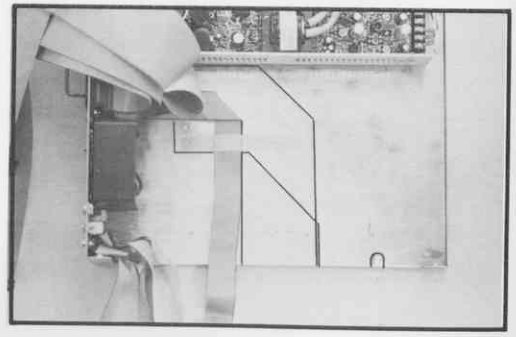


Figure 43 *Disk Data Cable on Trace A*

4.20 Identify the wide disk command cable. Position the cable along the line traced with Template B and tape it as shown in Figure 44. Be sure to leave 1/4'' clearance around the card cage mounting hole.

Be careful not to cover the card cage mounting hole with tape or with the cable itself. Don't tape the wide disk command cable in any place other than as shown.

4.21 Cut a 4'' length of filament tape. Fold the disk command cable back on itself and tape as shown in Figure 45.

The disk command cable should extend about 2-1/2'' over the edge of the chassis. (Don't worry if it's a bit longer).

4.22 IF YOUR SYSTEM HAS A 1/2'' TAPE CONTROLLER, SKIP TO STEP 4.25.

FOR SYSTEMS WITH 1/4'' TAPE CONTROLLER, identify two (2) tape cables, Position **both cables** along the line traced with template C. Then fold the longer cable UNDER the shorter one as shown below.

Tape the tape control cables in place along trace C as shown. The short tape cable should extend about 1-3/4'' and the long tape cable about 4-3/4'' over the edge of the chassis. (Don't worry if they're slightly longer.)

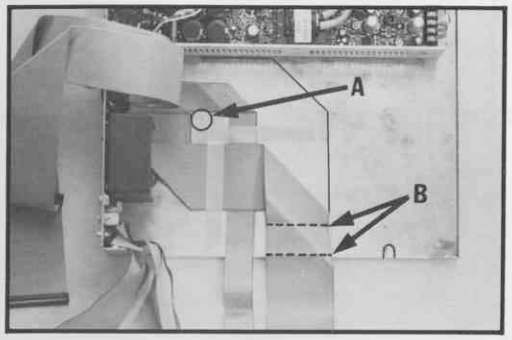


Figure 44 *Disk Command Cable on Trace B*

[A] *Cardcage Mounting Hole*
[B] *Fold Points*

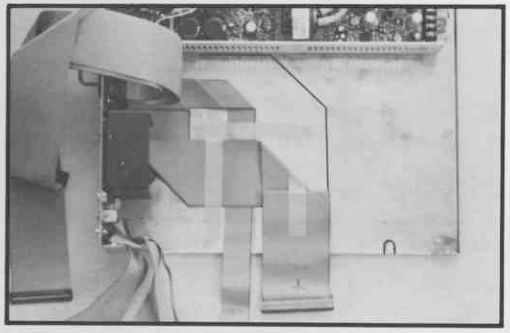


Figure 45 *Folding the Disk Command Cable*

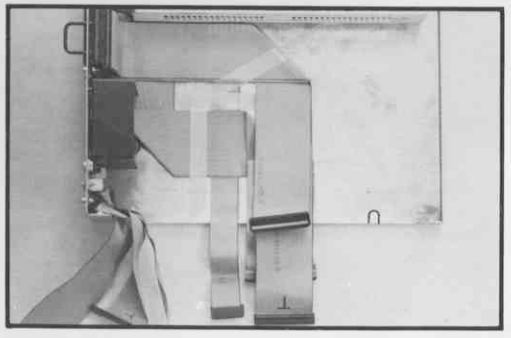


Figure 46 *Tape Cable Folds on Trace C (1/4'' Tape System)*

4.23 Lift the disk command cable and place it between the tape cables as shown in Figure 47.

4.24 The cables should extend past the edge of the chassis as follows:

Disk data cable	5''
Disk command cable	2-1/2''
Short tape control cable	1-3/4''
Long tape control cable	4-3/4''

SKIP TO STEP 4.27.

4.25 FOR SYSTEMS WITH 1/2'' TAPE CONTROLLER, identify the short tape cable. Fold this cable along trace D. Tape it in place as shown in Figure 48. Then put the tape cable under the disk command cable using the technique shown in the top part of Figure 47.

The cable should extend about 2-1/2'' over the edge of the chassis. (It can be slightly longer).

4.26 Fold the long tape control cable along trace E and tape it in place as shown in Figure 49. Be sure to leave 1/4'' clearance around the card cage mounting hole in the bottom of the chassis.

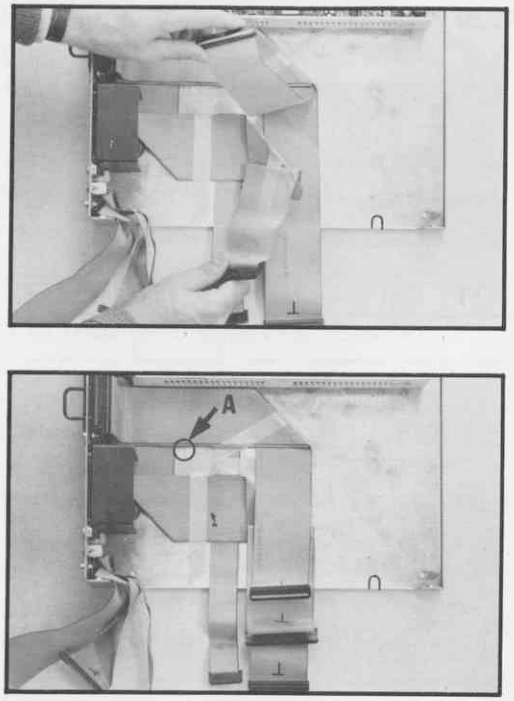


Figure 47 *Disk Command and Tape Cables (1/4" Tape System)*

[A] *Mounting Hole*

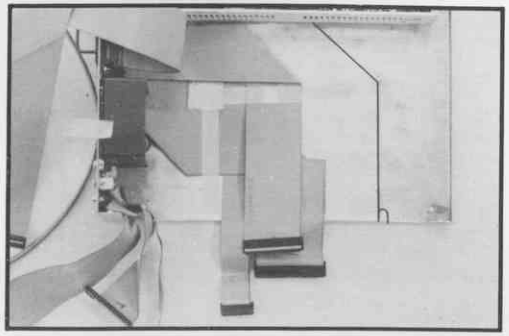


Figure 48 *Short Tape Cable on Trace D (1/2" Tape System)*

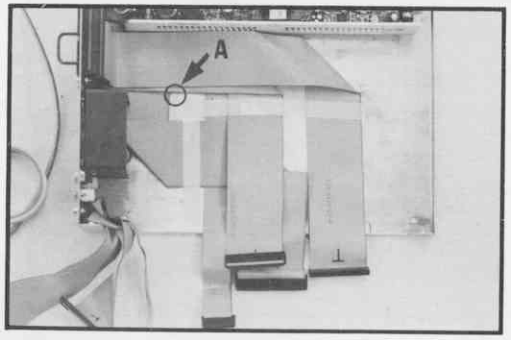


Figure 49 *Long Tape Cable on Trace E (1/2" Tape System)*

[A] *Mounting Hole*

The long tape control cable should extend about 2-1/2'' over the edge of the chassis.

The cables should extend past the edge of the chassis as follows:

Disk data cable	5''
Disk command cable	2-1/2''
Short tape control cable	2-1/2''
Long tape control cable	2-1/2''

4.27 Identify the round video cable with the 10-pin connector on its end.

Tape the video cable to the chassis as shown in Figure 50. The 10-pin connector should extend about 1-1/2'' over the edge of the chassis.

Note that the taping points DIFFER depending on whether your system has a 1/4'' or 1/2'' tape controller.

Video Cable Taping Points:

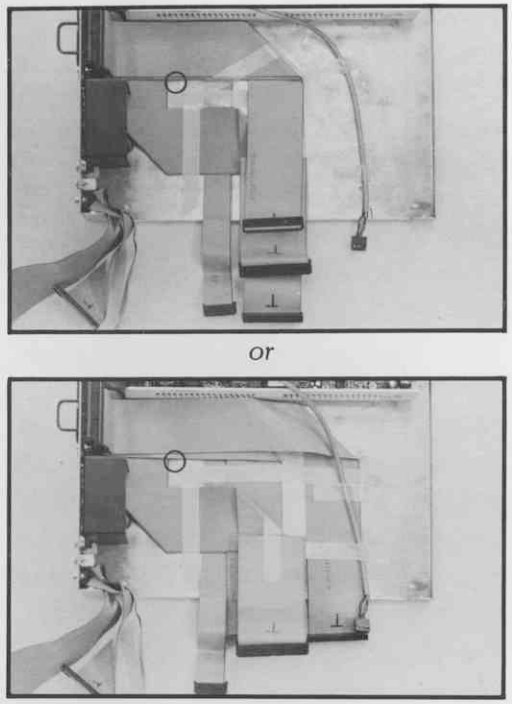
1/4'' tape system — tape to chassis
1/2'' tape system — tape to long tape control cable

Both systems — tape at 5'' from front edge of chassis

4.28 Figure 50 shows completed cable routings. Note the clearance around the card cage mounting holes.

Figure 50 doesn't show color cable routing. Power and heat restrictions prevent the Model 100U Workstation from running both a Xylogics 450 disk controller and a color board.

AS A FINAL CHECK, be sure the striped edge of each ribbon cable is to the RIGHT as the cables leave the chassis (see Figure 50).



or

Figure 50 *Video Cable*

Card Cage Installation

4.29 Place the copper base plate into position over the ribbon cables. Align it with four (4) screw holes in the bottom of the chassis. Align the video cable with the notch at the front of the plate.

4.30 Carefully lower the card cage into the chassis and align it with the screw holes in the base plate. Be careful not to crimp or snag any cables. If you do damage a cable, contact Sun Field Support immediately.

Install two (2) Phillips screws through the bottom of the chassis, through the copper plate, and into the card cage mounting. Install the screw at the right front edge of the chassis first. Then install the screw at the left front edge.

4.31 Rotate the chassis to access the remaining two (2) screw holes. Install a Phillips screw in each hole. (You may need to push the card cage down gently to engage the screws).

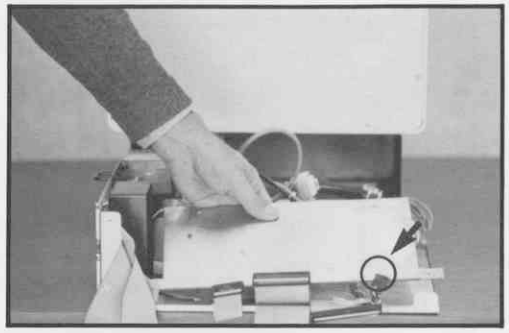


Figure 51 *Base Plate Installation*

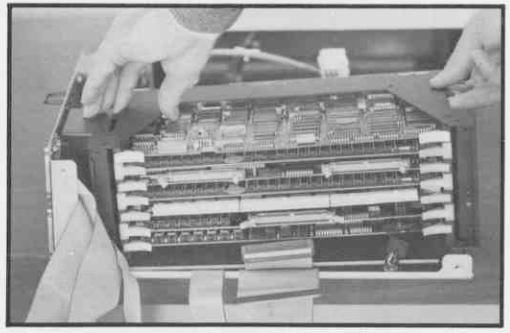
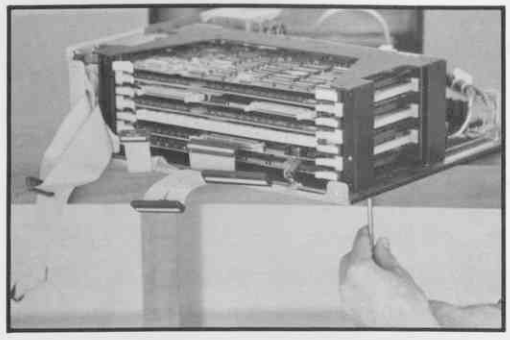


Figure 52 *Card Cage Installation*



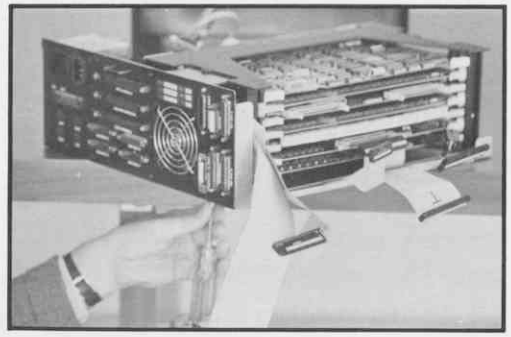


Figure 53 *Screw Holes on Underside of Chassis*

4.32 Check that all necessary boards are installed in the card cage (Ethernet, color board, etc.). See the *Configuration Overview* to verify that your board configuration is correct. Instruction 5.1 in this *Installation Guide* also shows typical configurations.

4.33 If your system had restraining rails at the left and right edges of the card cage, make sure they're installed as shown in Figure 54.

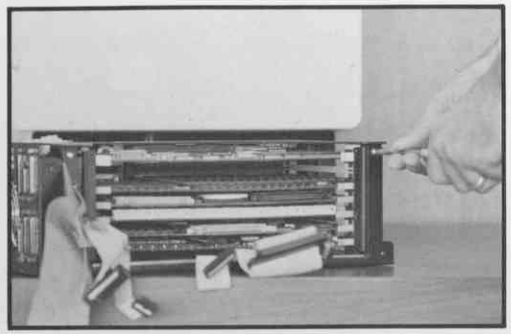


Figure 54 *Restraining Rail Installation*

Cable Connections

4.34 Connect the 10-pin video connector (running from the notch in the copper base plate) to the video board in the bottom card cage slot.

4.35 Identify the short tape control cable.

If you have a 1/4" tape controller board in slot 6, connect this cable to it.

If you have a 1/4" tape controller in slot 1, fold the short tape control cable under the video board as shown in Figure 55.

Figure 55 *Short Tape Control Cable*
[A] *10 mbit Ethernet cable*

4.36 Connect the disk command and disk data cables to the Xylogics 450 board as shown in figure 56. Then, if you have a 1/2" tape controller board, connect both tape control cables to it.

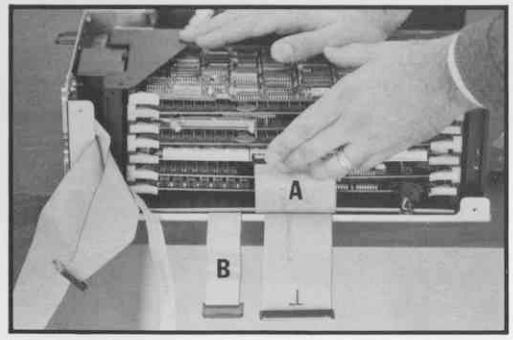


Figure 56 *Disk Command and Disk Data Cables*
[A] *Disk command cable*
[B] *Disk data cable*

4.37 Check to see whether you have a 10mbit Ethernet board. This board has a single blue connector as shown in Figure 57.

IF YOU DO HAVE AN ETHERNET BOARD, it should be located in the top slot of the card cage. Do NOT connect the Ethernet cable to the board yet.

IF YOU DON'T HAVE AN ETHERNET BOARD, identify the 10mbit Ethernet cable shown in Figure 55. Roll up the Ethernet cable and tuck it between the card cage and the chassis as shown below:

4.38 Connect the keyboard/mouse cable to the CPU board as shown in Figure 59. **Skip to step 4.40 if you have a 1/2'' tape controller.**

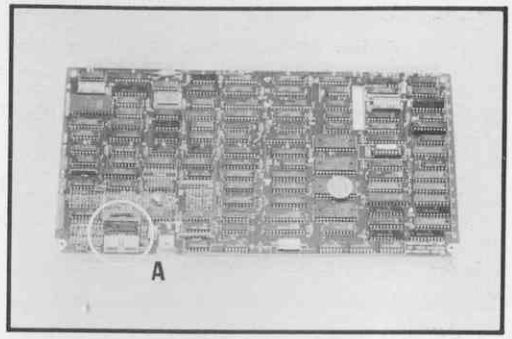


Figure 57 *10mbit Ethernet Board*
[A] *Blue connector*

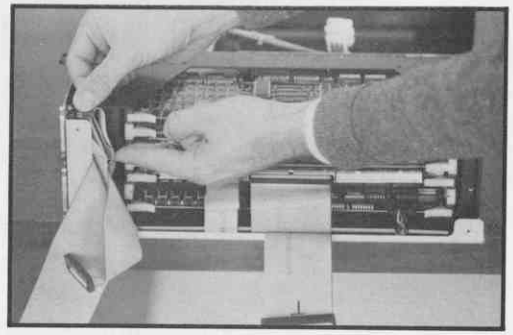


Figure 58 *Ethernet Cable (System Without Ethernet Board)*

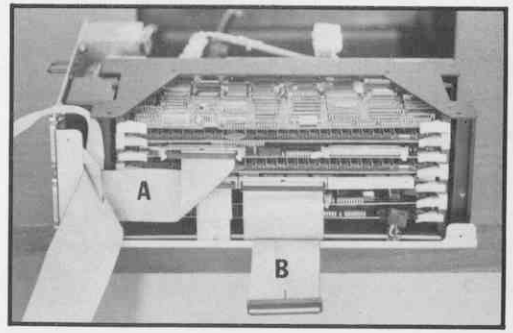


Figure 59 *Keyboard/Mouse Cable Connection*
[A] *keyboard/mouse cable*
[B] *long tape control cable*

4.39 If you've already connected the short tape control cable to the 1/4'' tape controller, tuck the long tape control cable (Figure 59) between boards 1 and 2 OR 2 and 3 in the card cage.

If you have a 1/4'' tape controller board in slot 1, connect the long tape control cable to it as shown in Figure 60.

4.40 Connect the RS232 cable to the CPU board as shown in Figure 61.

4.41 If you have a 10mbit Ethernet board, connect the narrow Ethernet cable to it (Figure 61).

All ribbon cables should now be routed correctly.

Connect the 12-wire DC power connector at the front of the card cage. Press the connector halves firmly together to lock them securely (Figure 62).

If you do NOT have a Sun Peripheral Subsystem, CONTINUE WITH SECTION 5.

Figure 60 *Long Tape Control Cable*

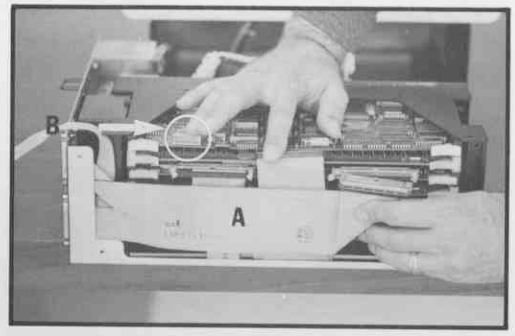


Figure 61 *RS232 Cable and Ethernet Cable*
[A] *RS232 cable*
[B] *Ethernet cable and Ethernet board connector*

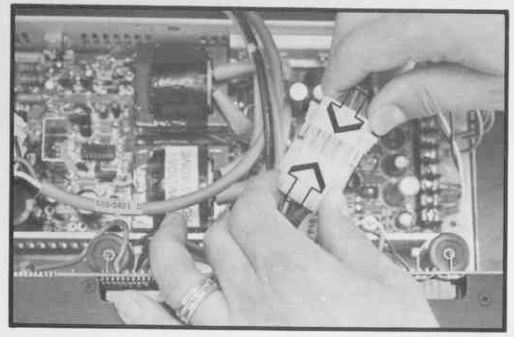


Figure 62 *DC Power Connector*

Sun Peripheral Subsystem

If you have a Sun Peripheral Subsystem with an 84 MB Fujitsu disk, you'll need to check switch settings on the disk. Continue with step 4.42.

If your system has a 169 MB disk, contact Sun Field Support for switch setting information.

4.42 TURN OFF POWER TO THE PERIPHERAL SUBSYSTEM AND DISCONNECT THE POWER CORD.

Remove four (4) Phillips screws at the back of the Subsystem unit as shown in Figure 63.

4.43 Remove two (2) Phillips screws on each side of the Subsystem unit (Figure 63).

4.44 Lift the outer cover off the Subsystem unit (Figure 64).

4.45 The inner cover, if you have one, should now be visible. Remove eight (8) Phillips screws which fasten the interior cover of the unit (Figure 65).

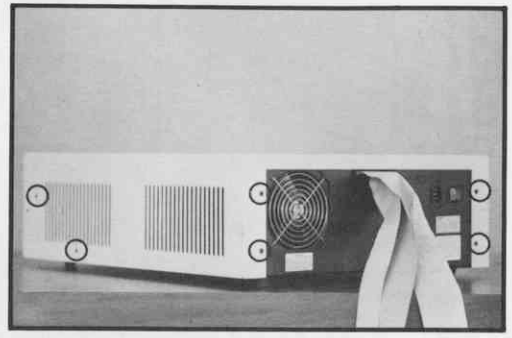


Figure 63 *Peripheral Subsystem Unit*

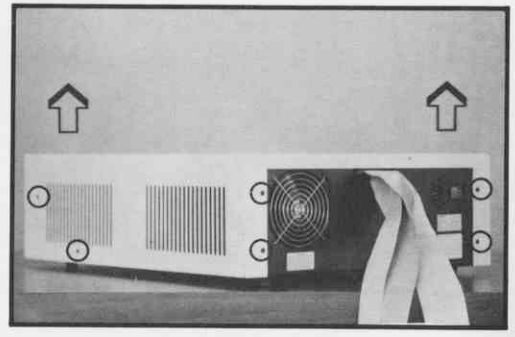


Figure 64 *Outer Cover Removal*

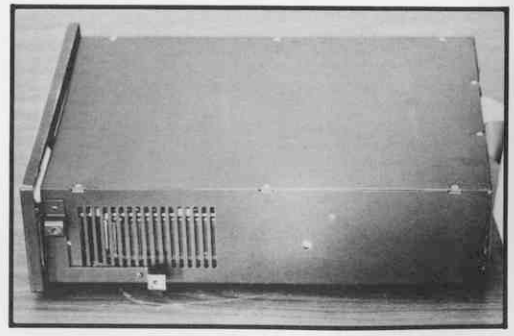


Figure 65 *Inner Cover*

4.46 Lift the inner cover off the Subsystem unit (Figure 66).

4.47 Figure 67 shows the switches at position **SW2** on the disk drive housing.

4.48 Set all switches at SW2 ON.

4.49 Reinstall the inner and outer covers on the Peripheral Subsystem unit. Use eight (8) Phillips screws for each cover.

CONTINUE WITH SECTION 5 TO COMPLETE THE UPGRADE.

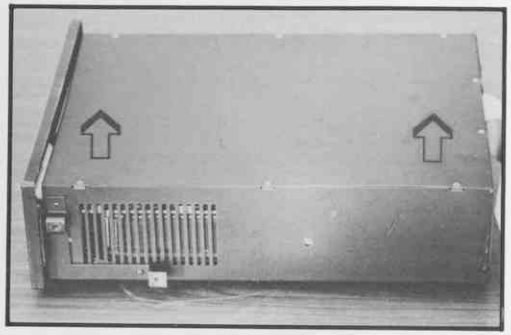


Figure 66 *Inner Cover Removal*

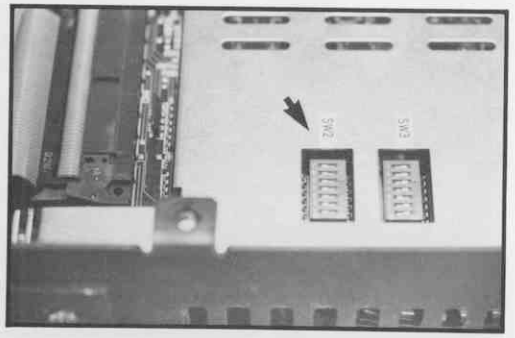


Figure 67 *SW2 Switches*

Section 5 - Completing Model 100 Upgrade

In this Section you'll complete the Model 100 upgrade in this sequence:

(1) install the chassis in the workstation
(2) run the system self-test
(3) pack old boards for return to Sun Microsystems
(4) install the new Sun Unix release

Chassis Installation

5.1 Figure 68 shows typical upgraded configurations.

1	Ethernet
2	(1MB memory)
3	CPU
4	1MB memory
5	Disk controller
6	1/4"tape controller
7	Video

1	1/4" tape controller
2	(1MB memory)
3	CPU
4	1MB memory
5	Disk controller
6	
7	Video

1	Ethernet
2	(1MB memory)
3	CPU
4	1MB memory
5	
6	Color display controller
7	Video

Figure 68 *Typical Upgraded Configurations*

5.2 If your system had restraining rails at the left and right edges of the card cage, be sure the rails are in place.

Check that all cables are properly connected to the boards in the card cage and that the boards are securely in place.

5.3 Position the workstation and chassis as shown in Figure 70.

5.4 Grasp the chassis handle as shown in Figure 71 and gently slide the chassis into the workstation.

BE CAREFUL NOT TO CUT, TEAR, OR CRIMP ANY CABLES AS YOU INSTALL THE CHASSIS — ESPECIALLY AT THE POINTS SHOWN IN FIGURE 71.

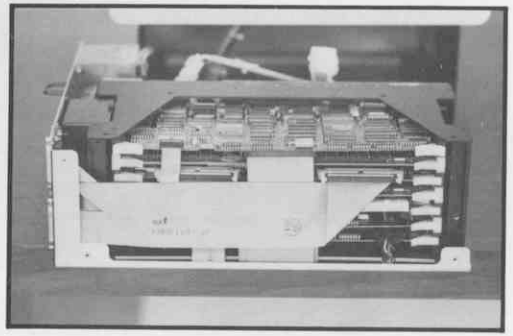


Figure 69 *Reassembled Card Cage*

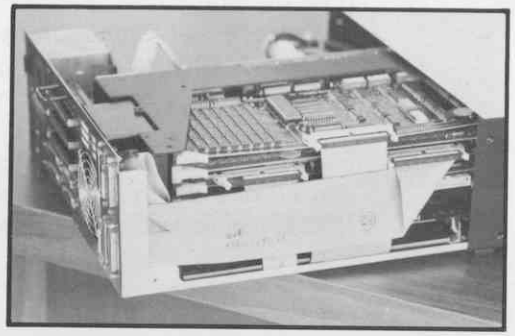


Figure 70 *Workstation and Chassis*

Figure 71 *Chassis Installation*

5.5 Align the chassis with three (3) screw holes on each side of the workstation. Install six (6) Phillips screws as shown in Figure 72 to fasten the chassis and workstation.

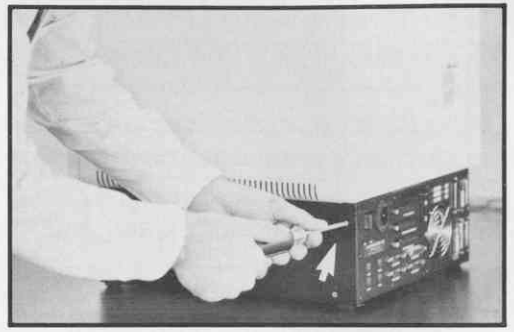


Figure 72 *Phillips Screw Installation*

5.6 Connect the AC power cord and external cables to the workstation.

Note

If your system uses RS232 Port A, you may need to install the null modem cable included in your Upgrade Kit.

With the Sun 2 CPU board, serial ports A and B are both DTE (Data Terminal Equipment) ports with modem control. Port A had been a DCE (Data Communications Equipment) port with the Sun 1 or 1.5 CPU board.

Install the null modem cable on Port A if you have already purchased or built an RS232 cable for Port A. Then connect the RS232 cable to the null modem cable.

System Self-Test

5.7 Turn ON power to the workstation. The system will run its self-test and display the message

---

Self Test Completed Successfully

5.8 The system will then try to boot the operating system, but should NOT be able to. Instead, you'll see a message like one of the following:

Waiting for disk to spin up
(if your disk is disconnected or turned OFF)

Protection Bus Error
(you've not yet installed Sun Unix Rev 1.0)

Don't be concerned about these messages at this point. You're only checking that your system passes Self-Test.

If the system passes Self-Test, continue with Step 5.9.

IF THE SYSTEM DOES NOT PASS SELF-TEST, CALL SUN FIELD SUPPORT AT (415) 960-1300.

Returning Old Boards

Note

Use the box in which the new boards were shipped to you AND the pre-addressed Airborne waybill included in the box to return your boards.

5.9 Identify the boards you're returning to Sun Microsystems. The white packing slip shipped with your Upgrade Kit lists the boards for return. If you don't have the packing slip, use the table below:

If Your Upgrade Kit Included	Then Return
Sun 2 CPU board	Sun 1 68000 or Sun 1.5 68010 CPU board
1 low power 1 MB memory board	1 standard memory board (768 K or 1 MB)
2 low power 1 MB memory boards	2 standard memory boards (one 768 K and one 1 MB board or two 1 MB boards)
Xylogics 450 single-board disk controller	Xylogics 440 2-board disk controller (return both boards)
any of the above	all Chrislin Multibus memory boards purchased from Sun Microsystems

Figure 73 *Board Returns*

5.10 Locate the box in which the Upgrade boards were shipped to you and the pre-addressed Airborne waybill included in the box.

5.11 Place the return boards in the shipping box and seal it securely with shiping or masking tape.

5.12 Write your CRMA number PROMINENTLY on the outside of the shipping box. The CRMA (Customer Return Material Authorization) number is shown on the Sun packing list and on the Airborne waybill. Complete the Airborne waybill by filling in your name and address. Then telephone your local Airborne office and request a pickup. Airborne will pick up the box at your location and forward it to Sun. You will be billed for the freight charges.

5.13 RETURN THE BOARDS TO SUN MICROSYSTEM PROMPTLY. If old boards are not returned within 30 days of your receiving the Upgrade Kit, you will be invoiced for the list price of these boards.

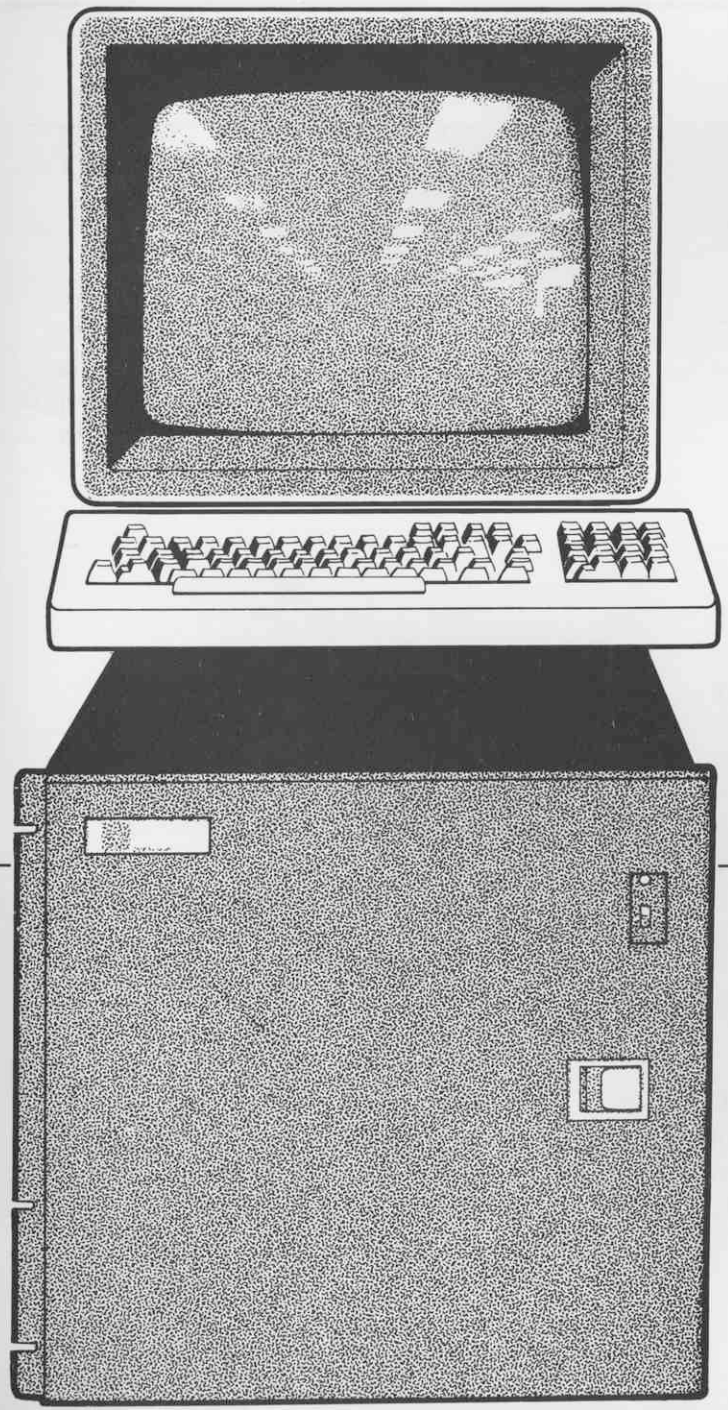
Software Installation

5.14 To complete the upgrade, you must reformat your disk and install the new Sun Unix software. See the *System Manager's Manual* included in your Upgrade Kit.

Note

If your workstation is a diskless client linked by Ethernet to a Sun M100U or M150U fileserver, you must upgrade the fileserver to Sun 2 architecture and Rev 1.0 software for diskless operation.

Follow the procedures in this Upgrade guide as appropriate.



PART II

SUN MODEL 150 WORKSTATION

Section 6 - Model 150 Upgrade

This Section has instructions for upgrading the Sun Model 150 rack-mountable workstation. Follow the numbered steps in sequence.

Note

The Company disclaims any and all liability for personal injury and/or property damage resulting from failure to comply fully with instruction 6.3 below.

CPU Board

6.1 Use the *tar* command to make a tape backup of your system. With UNIX Version 7, you must use *tar* since *dump* formats are different for Version 7 and 4.2. Section 7 of the System Manager's Manual shipped with your upgrade gives advice about which files to save.

If the workstation is running, halt UNIX (/etc/halt for UNIX 4.2 beta release; sync followed by setup A for Version 7 systems).

6.2 Be sure the workstation is resting securely on a flat surface or is installed in a rack. Allow at least 24'' clearance to open the front door of the unit.

6.3 **TURN OFF POWER TO THE SYSTEM AND DISCONNECT THE AC POWER CORD FROM THE REAR OF THE WORKSTATION.** Do not continue with this procedure until the system has been disconnected from its power source. Failure to do so may result in electrical shock.

6.4 Unlatch and open the front door as shown in Figure 74.

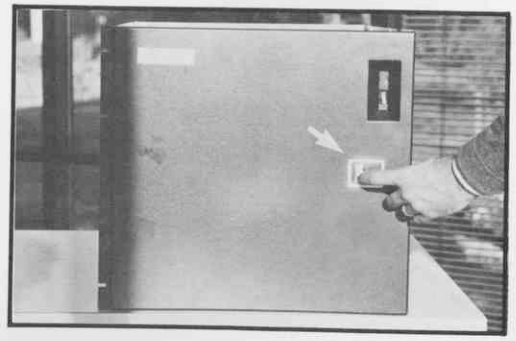


Figure 74 *Model 150 Workstation*

6.5 See Figure 75 to identify two (2) restraining rails at the top and bottom edges of the card cage.

Note: Some workstations may not have these rails.

6.6 Unscrew both restraining rails.

6.7 The printed circuit boards are arranged from left-to-right in the 15 card cage slots. **Slot 1 is on the left**. Figure 76 shows a typical configuration.

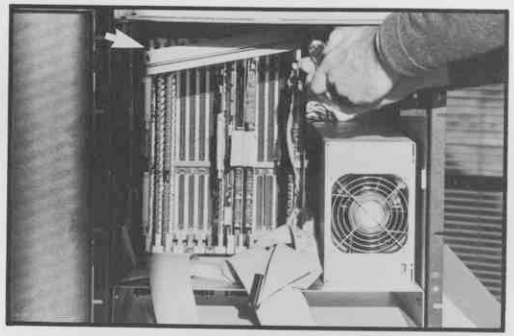


Figure 75 *Restraining Rails*

BOTTOM

1	68010 CPU
2	1 mB Main Memory
3	1 mB Memory Expansion
4	
5	
6	
7	
8	256k Multibus Memory
9	10 Mbps Ethernet Controller
10	Disk Controller
11	(Disk Controller)
12	1/2" Tape Controller
13	
14	Color Display Controller
15	Monochrome Display Controller

TOP

Figure 76 *Typical Model 150 Configuration*

6.8 The Sun 1 or Sun 1.5 CPU board is in slot 1.

The keyboard/mouse connector is near the bottom edge of the CPU board. The RS232 connector is about two-thirds up the board. Figure 77 shows these connectors.

Using masking tape and a felt-tip maker, label the RS232 and Keyboard/mouse cables.

Disconnect the cables from the CPU board after labelling them.

Note

Throughout this upgrade, we suggest you use masking tape and a felt-tip marker to identify cables as you disconnect them. This makes it easy to reinstall the cables correctly.

6.9 Remove the CPU board by pulling outward on the levers at the top and bottom of the board. Then slide the board out of the card cage. Figure 78 shows how to do it.

6.10 Compare the CPU board to Figure 79 to identify the Sun 1 or 1.5 CPU board which you'll return to Sun.

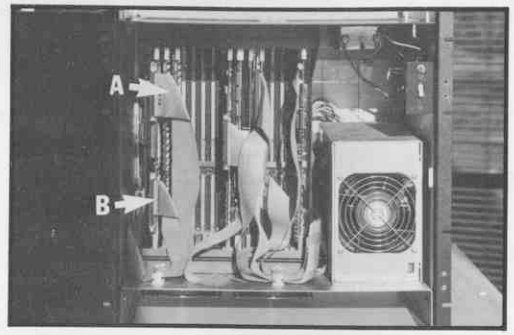


Figure 77 *Cable Connectors*
[A] *RS232 cable*
[B] *keyboard/mouse cable*

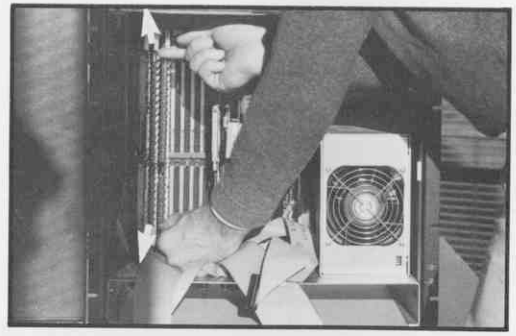


Figure 78 *Removing the CPU Board*

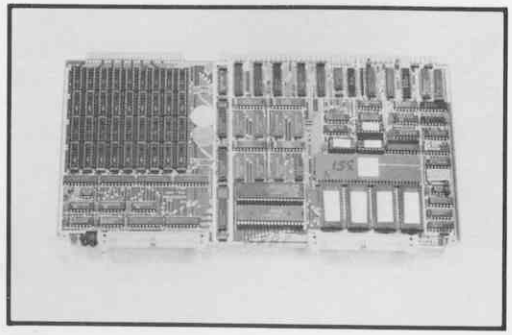


Figure 79 *Sun 1 and 1.5 CPU Boards*

6.11 See Figure 80 to identify the Sun 2 CPU board included in your Upgrade Kit.

The Sun 2 CPU board has 4 jumper plugs near its edge. REMOVE THE JUMPER as shown in Figure 80.

6.12 Slide the Sun 2 CPU board into slot 1 in the card cage.

When the board touches the back of the card cage, you may need to press the center of the board gently left and right to seat it in the backplane connector. The *component side* of the board faces LEFT.

Figure 81 shows CPU board installation.

With the CPU board completely in the card cage, press inward on the board to lock it in place.

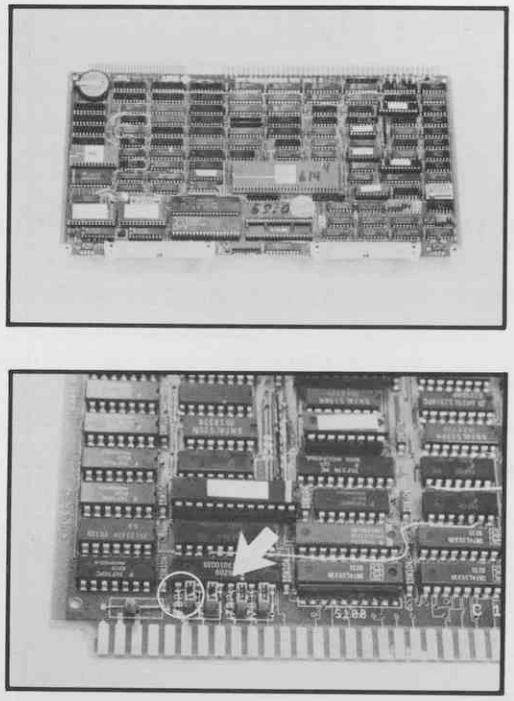


Figure 80 *Sun 2 CPU Board and Jumpers*

[A] *Remove this jumper.*

Figure 81 *Sun 2 CPU Installation*

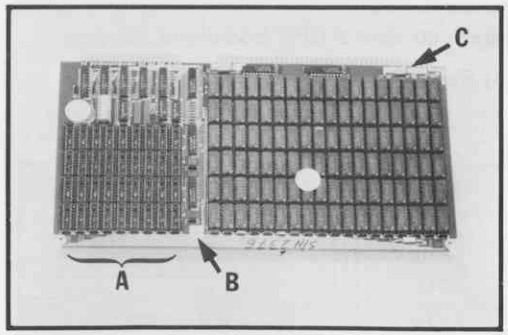
Memory Boards

6.13 The main memory board is in slot 2. If you have a second main memory board, it will be in slot 3. Remove the memory board(s) from the card cage.

6.14 **Compare the memory board(s) to those in Figure 82.**

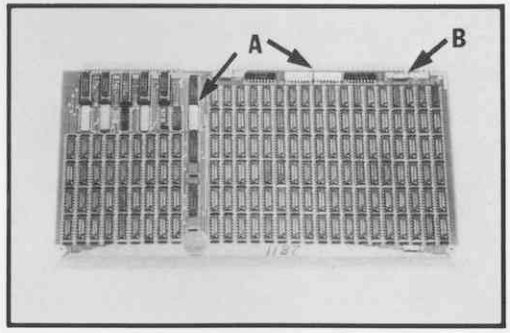
The memory boards are either standard or low power boards, depending on their power consumption in normal use. When used with the Sun 2 CPU, the low power memory boards draw less power than standard boards.

6.15 If your system has STANDARD memory board(s) you should have received LOW POWER boards to replace them. If you did not receive low power boards to replace your standard boards, contact Sun Field Support. **SKIP TO STEP 6.17**.



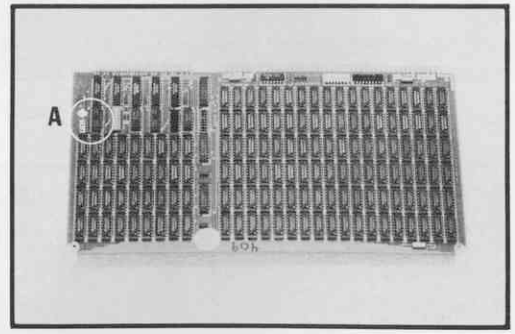
Standard Rev B 768k or Standard Rev B 1mB

[A] *768k board has no RAM chips in this area*
[B] *SUN logo*
[C] *Rev B shown here*



Standard Rev C 1 mb

[A] *White resistor packs in 3 locations*
[B] *Rev C shown here under "SUN Microsystems"*



Low Power 1mB

[A] *SUN Logo*

Figure 82 *Main Memory Boards*

6.16 If your system has one LOW POWER memory board, replace it in slot 2 of the card cage.

If your system has two LOW POWER memory boards, replace one in slot 2 and the other in slot 3.

The component side of the board faces LEFT.

Figure 83 shows the upgraded CPU and memory board configuration.

Lock each board in place.

CONTINUE WITH STEP 6.20

6.17 See figure 84 to identify the LOW POWER 1 mB memory board(s) included in your Upgrade Kit. If your system has 2 mBs of main memory, the Upgrade Kit should include two low power memory boards.

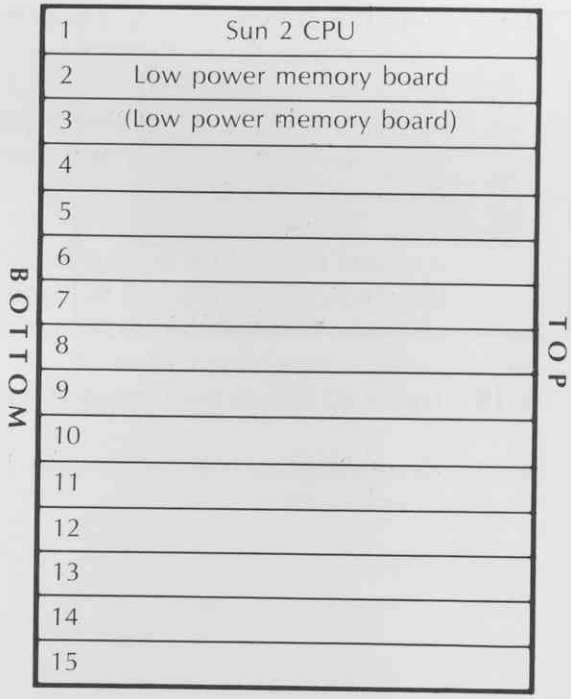


Figure 83 *Upgraded CPU and Memory Board(s)*

6.18 Note the switches at the position marked U506 on the low power memory board(s) in Figure 84.

For the first 1mB of main memory, set switch 1 at U506 ON and all the others OFF. Then insert this memory board in slot 2 of the card cage and latch it in place.

If you're installing a second memory board, set switch 2 at U506 on the second board ON and all the others OFF. Insert the second memory board in slot 3 of the card cage and latch it in place.

6.19 Figure 85 shows the upgraded memory board configuration.

6.20 Reconnect the keyboard/mouse and RS232 cables to the Sun 2 CPU board.

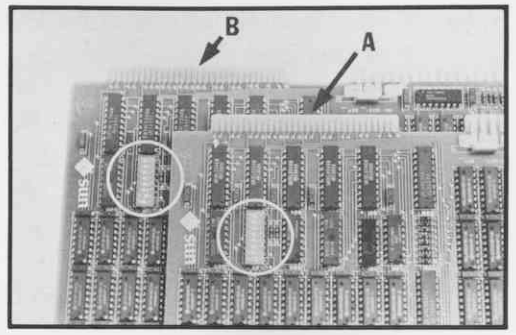


Figure 84 *Low Power 1 mB Memory Board*

[A] *1st Main Memory Board: U506 Switch 1 ON, all others OFF*

[B] *Optional 2nd Main Memory Board: U506 Switch 2 On, all others OFF*

BOTTOM

1	Sun 2 CPU
2	Low power memory board
3	(Low power memory board)
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

TOP

Figure 85 *Upgraded CPU and memory Board(s)*

Chrislin Multibus Memory Boards

6.21 IF YOUR SYSTEM HAS A SUN PERIPHERAL SUBSYSTEM WITH A 1/4'' CARTRIDGE TAPE DRIVE, SKIP TO STEP 6.23.

IF YOUR SYSTEM IS A DISKLESS CLIENT WITHOUT A TAPE DRIVE SKIP TO STEP 6.27.

IF YOUR SYSTEM HAS A SUN PERIPHERAL SUBSYSTEM WITH A D84 OR D169 DISK DRIVE OR A 1/2'' REEL-TO-REEL TAPE DRIVE AND DOES NOT HAVE A 1/4'' CARTRIDGE TAPE DRIVE, you must remove the Chrislin Multibus memory board from the card cage.

Note

1/4" tape controller boards were used in some systems to provide Multibus memory, even though no 1/4" tape drive is present. The 1/4" tape controllers should be removed from these systems. See Figure 88 to identify the 1/4" tape controller.

The Chrislin board is normally in slot 8 of the card cage. Figure 86 shows a Chrislin Multibus memory board.

6.22 Compare the boards in your system to Figure 86. Set Chrislin boards aside for return to Sun Microsystems. Chrislin board(s) will NOT be used in the upgraded workstation.

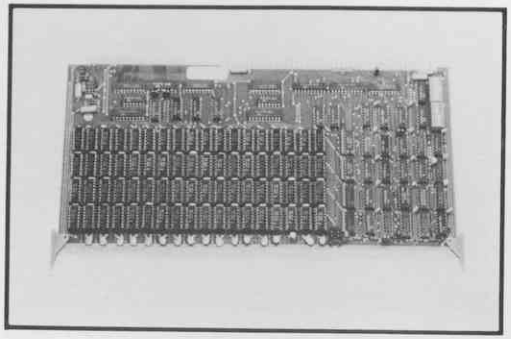


Figure 86 *Chrislin Multibus Memory Board*

Note

Chrislin boards or other Multibus memory boards are NOT needed for Sun 2 operation. The upgraded workstation will not operate with Chrislin board(s) installed.

Return Chrislin board(s) to Sun Microsystem as described at the end of this Installation Guide.

If you've removed boards that are not Chrislin multibus memory boards, replace them in their original slots and reconnect the cable(s).

SKIP TO STEP 6.27.

Tape Controllers

6.23 IF YOUR SYSTEM HAS A 1/4" INCH TAPE CARTRIDGE DRIVE, locate the Sun 1/4" tape controller board. This board is most likely in Slot 8 of the card cage, as shown in Figure 87.

6.24 Use masking tape and a felt-tip marker to label the tape controller ribbon cable attached to the tape controller board.

Disconnect the cable from the tape controller board.

Remove the tape controller board and identify it as shown in Figure 88.

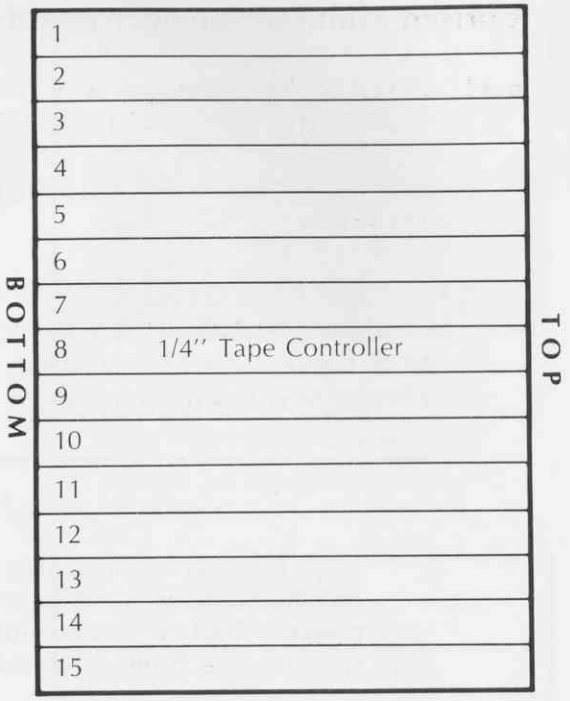


Figure 87 *Typical 1/4" Tape Controller Location*

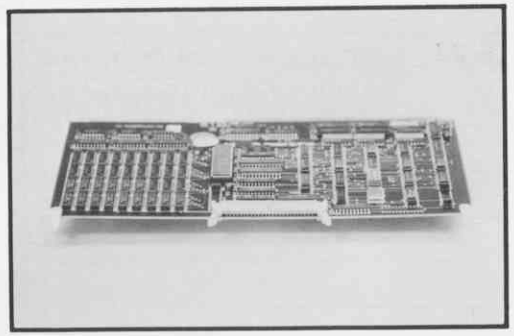


Figure 88 *1/4" Tape Controller Board*

6.25 Locate the switches at the position marked U50 on the 1/4'' tape controller board. Set the switches **OFF** or **OPEN** as shown in Figure 89 to disable the 1/4 mB of Multibus memory located on the board.

The 1/4 mB memory MUST BE DISABLED for the workstation to operate.

6.26 Slide the 1/4'' tape controller board into its original location (usually slot 8) in the card cage. When the board is seated at the back of the cage, press inward on the board to lock it in place.

Reconnect the tape controller cable.

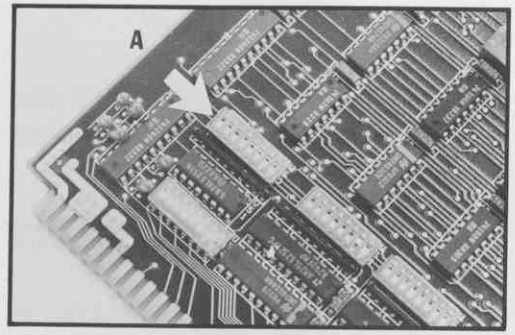


Figure 89 *Tape Controller U50 Switches*
[A] *All switches at U50 should be OFF or OPEN*

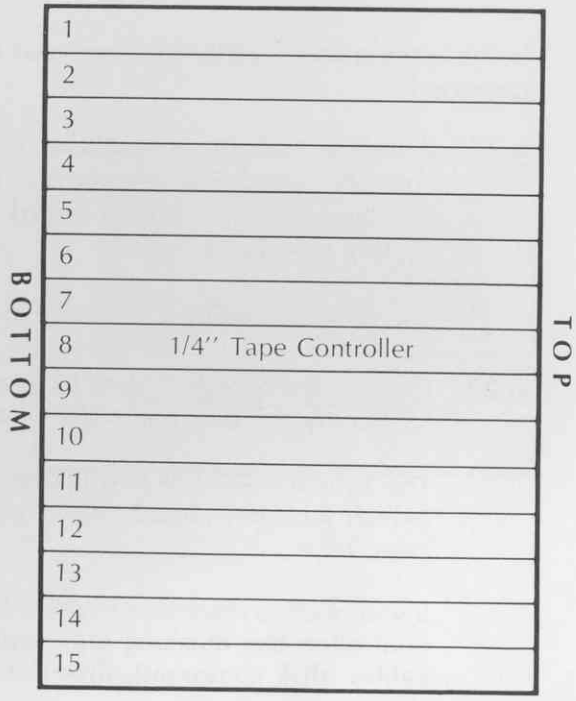


Figure 90 *Typical 1/4" Tape Controller Location*

Disk Controller Check

The present upgrade replaces the dual-board Xylogics 440 disk controller with the single-board Xylogics 450. It does *not* replace Xylogics 450 or Interphase 2180 disk controllers.

Note

If you wish to replace an Interphase 2180 disk controller with a Xylogics 450, contact your Sun Sales Representative for details about the appropriate field upgrade.

In this section you'll verify whether your system's disk controller needs to be upgraded.

6.27 If your system uses a local disk drive, you'll need to identify the disk controller board. The Interphase 2180 and Xylogics 450 are single boards. The Xylogics 440 is a **dual-board controller** with a ribbon cable connecting the boards.

The disk controller is typically in slot 10 and/or 11 of the card cage.

6.28 Remove the boards in slots 10 and 11 and compare them to Figure 92 to identify the disk controller board.

The Xylogics 440 has two boards connected by a short ribbon cable (which you may already have removed). Remove both boards at the same time.

If you need to disconnect cables from other boards to remove the disk controller, **use masking tape and a felt-tip marker to identify these cables (disk command, disk data, etc.) as you disconnect them.**

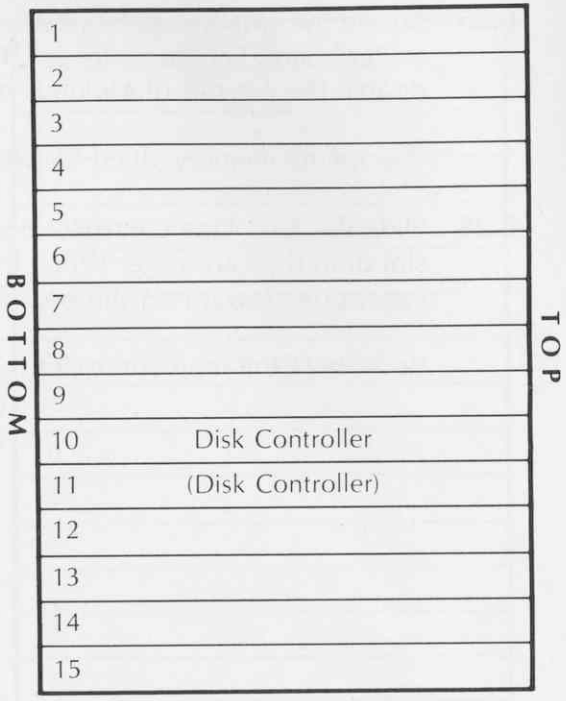


Figure 91 *Typical Disk Controller Locations*

6.29 If you determine that your system does NOT have a disk controller, replace the boards and SKIP TO STEP 6.47.

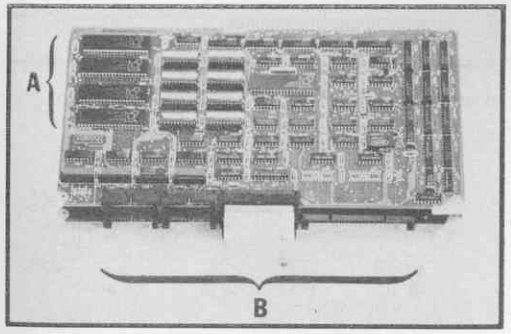
If your disk controller is a dual-board Xylogics 440, SKIP TO STEP 6.34.

If your disk controller is a Xylogics 450, install it in slot 11 of the card cage. Continue with Step 6.31.

If your disk controller is an Interphase 2180, continue with Step 6.30.

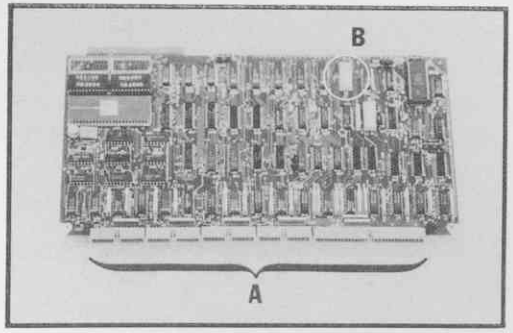
6.30 Locate the switches at position S2 on the Interphase 2180 board as shown in Figure 92. Check that ONLY switch 3 is ON.

Install the Interphase 2180 board in slot 11 of the card cage.



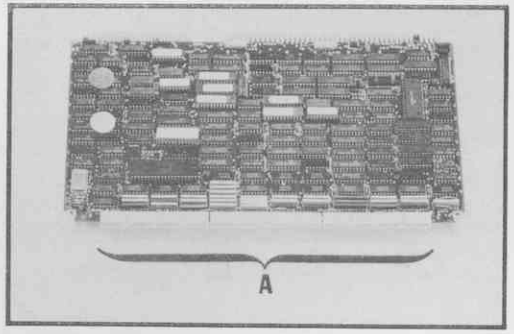
Xylogics 440

[A] *dual boards*
[B] *black connectors*



Interphase 2180

[A] *blue connectors*
[B] *S2 switches*



Xylogics 450

[A] *white connectors*

Figure 92 *Disk Controller Boards*

6.31 Figure 93 shows the new disk controller location.

Reconnect the disk controller cables.

6.32 Replace any other boards you removed from the card cage in Step 6.28 and reconnect their cables. Be sure all boards are latched in place.

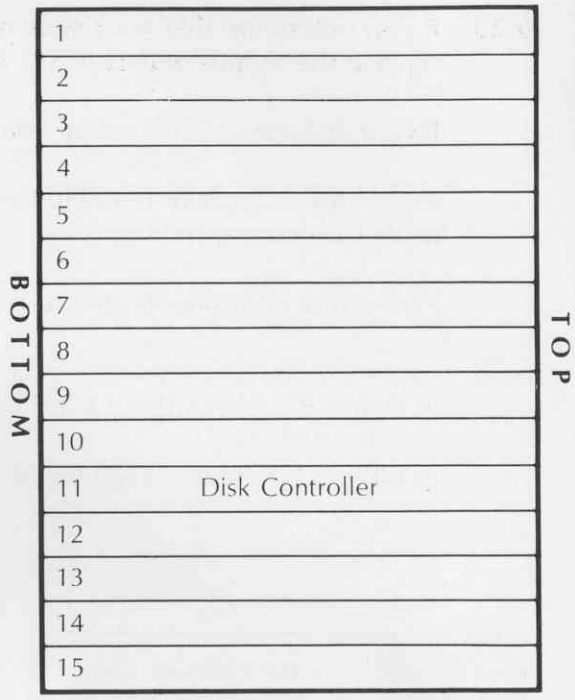


Figure 93 *New Disk Controller Location*

Disk Controller Upgrade

This section applies only to Model 150 workstations with Xylogics 440 disk controllers.

The following procedure replaces the dual-board Xylogics 440 disk controller with the single-board Xylogics 450.

Note

You must reformat your system disk for operation with the Xylogics 450. See the System Manager's Manual included in your documentation.

Follow this procedure if you've identified your disk controller as a Xylogics 440. You'll return the Xylogics 440 boards to Sun after the upgrade.

6.34 Locate the Xylogics 450 disk controller included in your Upgrade Kit, as shown in Figure 94. If you did not receive a Xylogics 450, contact Sun Field Support at (415) 960-1300 immediately.

6.35 Install the Xylogics 450 board in slot 11 of the card cage and latch it in place.

Figure 95 shows the new disk controller location.

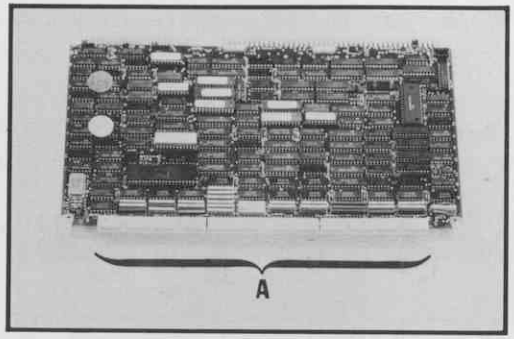


Figure 94 *Xylogics 450 Disk Controller*

[A] *white connectors*

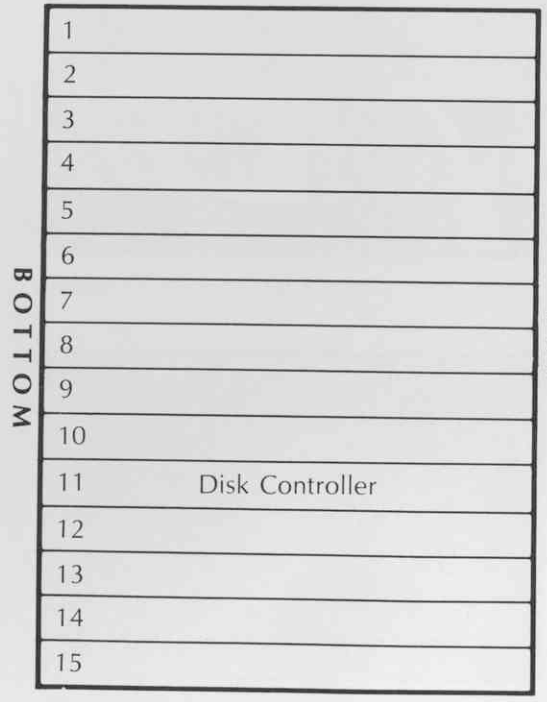


Figure 95 *Xylogics 450 Location*

6.36 Replace any other boards you removed from the card cage in Step 6.28. Be sure all boards are latched in place.

6.37 Reconnect the wide disk command cable to the large edge connector midway up the Xylogics 450 board. Figure 96 shows this connection.

Reconnect the disk data cable to the small edge connector below the disk command cable on the Xylogics 450 board.

6.38 If you do NOT have a Sun Peripheral Subsystem, CONTINUE WITH STEP 6.47.

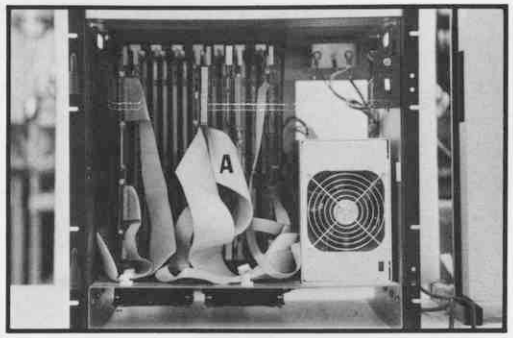


Figure 96 *Xylogics 450 Cables*

[A] *wide disk command cable*

Sun Peripheral Subsystem

If you have a Sun Peripheral Subsystem with an 84 mB Fujitsu disk, you'll need to check switch settings on the disk. CONTINUE WITH STEP 6.39.

If your system has a 169 mB disk, contact Sun Field Support for switch setting information.

6.39 TURN OFF POWER TO THE PERIPHERAL SUBSYSTEM AND DISCONNECT THE POWER CORD.

Remove four (4) Phillips screws at the back of the Subsystem unit as shown in Figure 97. If your subsystem is rack mounted, the cover normally secured by these screws is probably already removed.

6.40 Remove two (2) Phillips screws on each side of the Subsystem unit (Figure 97).

6.41 Lift the outer cover off the Subsystem unit (Figure 98).

6.42 The inner cover, if you have one, should now be visible. Remove eight (8) Phillips screws which fasten the inner cover of the unit (Figure 99).

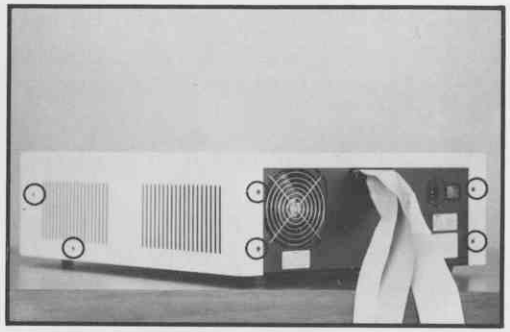


Figure 97 *Peripheral Subsystem Unit*

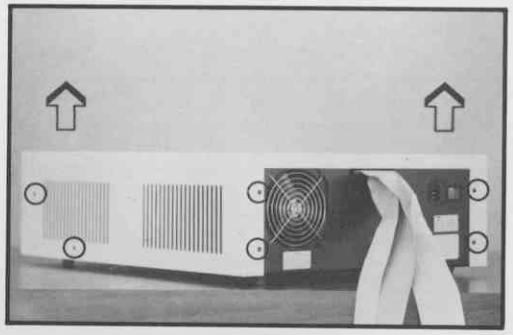


Figure 98 *Outer Cover Removal*

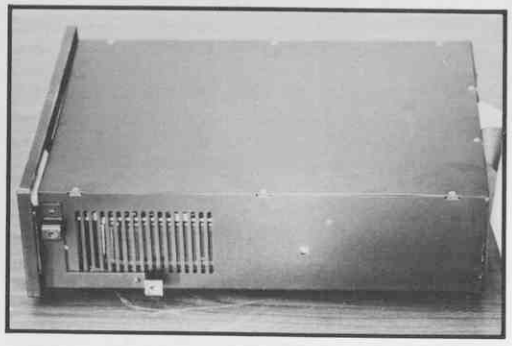


Figure 99 *Inner Cover*

6.43 Lift the inner cover off the Subsystem unit (Figure 100).

6.44 Figure 101 shows the switches at position **SW2** on the disk drive housing.

6.45 Set all switches at SW2 ON.

6.46 Reinstall the inner and outer covers on the Peripheral Subsystem unit. Use eight (8) Phillips screws for each cover.

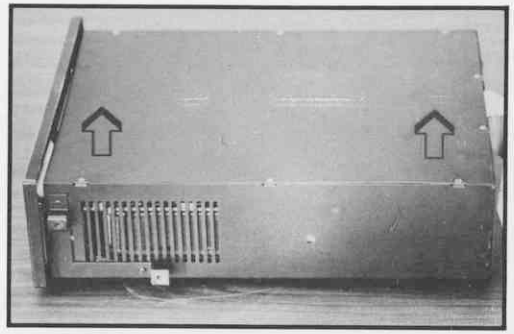


Figure 100 *Inner Cover Removal*

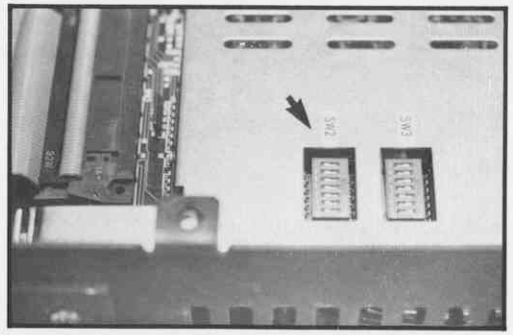


Figure 101 *SW2 Switches*

Completing Model 150 Upgrade

In this section you'll complete Model 150 upgrade in this sequence:

(1) check that all boards are correctly installed and connected
(2) run the system self-test
(3) pack old boards for return to Sun Microsystems
(4) install the new Sun Unix release

6.47 Figure 102 shows typical upgrade configurations.

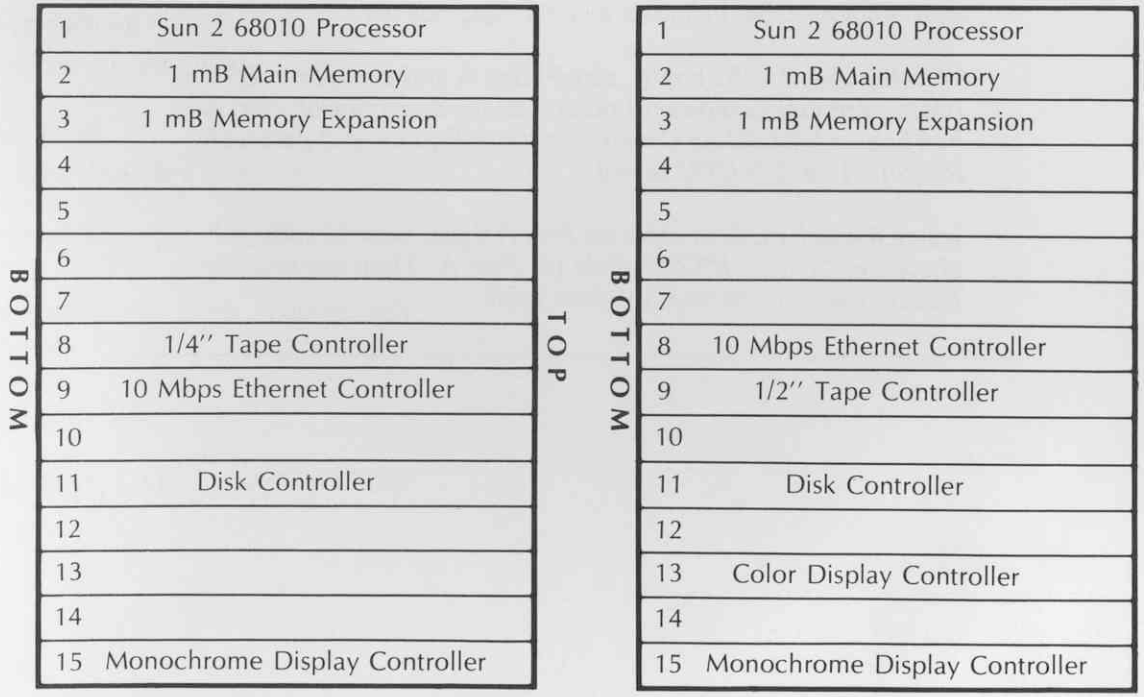


Figure 102 *Typical Upgraded Configurations — Model 150*

6.48 Check that all cables are properly connected to the boards in the card cage and that the boards are securely in place.

6.49 Install the restraining rails at the top and bottom of the card cage as shown in Figure 103. Some systems do not have these rails.

6.50 Close and latch the front door of the workstation.

6.51 Connect the AC power cord and external cables to the workstation.

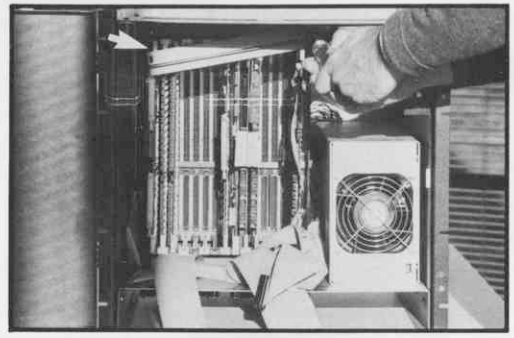


Figure 103 *Restraining Rail Installation*

Note

If your system uses RS232 Port A, you may need to install the null modem cable included in your Upgrade kit.

With the Sun 2 CPU board, serial ports A and B are both DTE (Data Terminal Equipment) ports with modem control. Port A had been a DCE (Data Communications Equipment) port with the Sun 1 or 1.5 CPU board.

Install the null modem cable on Port A if you have already purchased or built an RS232 cable for Port A. Then connect the RS232 cable to the null modem cable.

System Self-Test

6.52 Turn ON power to the workstations. The system will run its self-test and display the message

---

Self Test Completed Successfully

6.53 The system will then try to boot the operating system, but should NOT be able to. Instead, you'll see a message like one of the following:

Waiting for disk to spin up
(if your disk is disconnected or turned OFF)

Protection Bus Error
(you've not yet installed Sun Unix Rev 1.0)

Don't be concerned about these messages at this point. You're only checking that your system passes Self-Test.

If the system passes Self-Test, continue with Step 6.54.

IF THE SYSTEM DOES NOT PASS SELF-TEST, CALL SUN FIELD SUPPORT AT (415) 960-1300.

Returning Old Boards

Note

Use the box in which the new boards were shipped to you AND the pre-addressed Airborne waybill included in the box to return your boards.

6.54 Identify the boards you're returning to Sun Microsystems. The white packing slip shipped with your Upgrade Kit lists the boards for return. If you don't have the packing slip, use the table below:

If Your Upgrade Kit Included	Then Return
Sun 2 CPU board	Sun 1 68000 or Sun 1.5 68010 CPU board
1 low power 1 MB memory board	1 standard memory board (768 K or 1 MB)
2 low power 1 MB memory board	2 standard memory boards (one 768 K and one 1 MB board or two 1 MB boards)
Xylogics 450 single-board disk controller	Xylogics 440 2-board disk controller (return both boards)
any of the above	all Chrislin Multibus memory boards purchased from Sun Microsystems

Figure 104 *Board Returns*

6.55 Locate the box in which the Upgrade boards were shipped to you and the pre-addressed Airborne waybill included in the box.

6.56 Place the return boards in the shipping box and seal it securely with shipping or masking tape.

6.57 Write your CRMA number PROMINENTLY on the outside of the shipping box. The CRMA (Customer Return Material Authorization) number is shown on the Sun packing list and on the Airborne waybill. Complete the Airborne waybill by filling in your name and address. Then telephone your local Airborne office and request a pickup. Airborne will pick up the box at your location and forward it to Sun. You will be billed for the freight charges.

6.58 RETURN THE BOARDS TO SUN MICROSYSTEMS PROMPTLY. If old boards are not returned within 30 days of your receiving the Upgrade Kit, you will be invoiced for the list price of these boards.

Software Installation

6.59 To complete the upgrade, you must reformat your disk and install the new Sun Unix software. See the *System Manager's Manual* included in your Upgrade Kit.

Note

If your workstation is a diskless client linked by Ethernet to a Sun M100U or M150U fileserver, you must upgrade the fileserver to Sun 2 architecture and Rev 1.0 software to make diskless operation possible.

Follow the procedures in this Upgrade Guide as appropriate.

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