Replacing a NeXTstation™ and NeXTstation Turbo™ Processor Board

April 1992

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Robin Goodwin
Illustrations by Nancy Serpiello
Revised by Terry Williams

PN 4227.AA

Replacing the processor in a NeXTstation™ or a NeXTstation Turbo™ computer takes about 20 minutes and consists of the following steps:

1. Opening the computer
2. Removing the disk drives
3. Replacing the processor board
4. Reinstalling the disk drives
5. Closing the computer
6. Verifying system operation

Warning: The processor board, disk drives, and other components in the NeXTstation and the NeXTstation Turbo computer can be damaged by static electricity. Always wear a grounded static wrist strap and practice appropriate static-safe procedures when working inside the computer.

Opening the Computer

1. If the computer isn't turned off, press the Power key and follow the directions that appear on the screen.

   If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.

2. If a printer is connected to the computer, unplug the printer's power cord.

3. Unplug the computer's power cord and detach the cables connected to the rear of the computer.

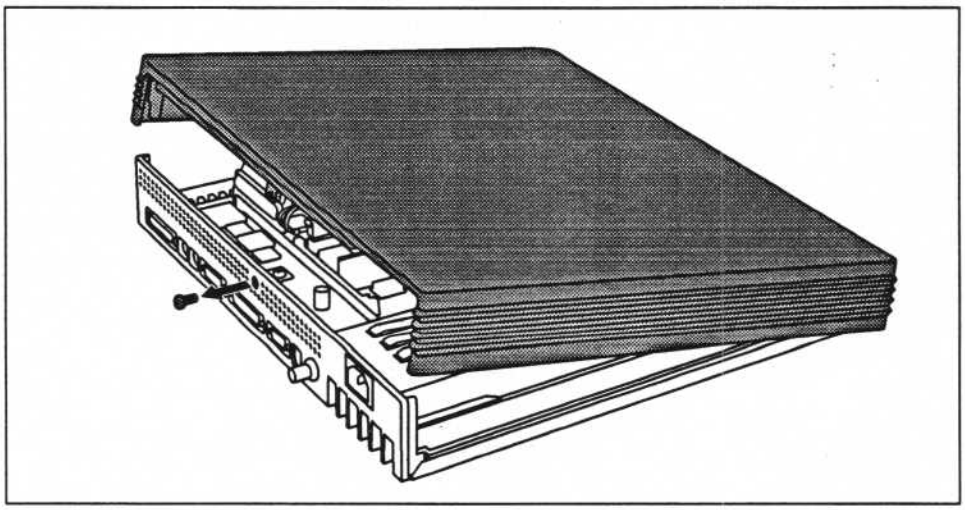
4. If the MegaPixel Display™ is on top of the computer, lift it off and set it out of the way.

5. Put the computer on the worktable.

6. Attach your wrist grounding strap and connect it to a suitable electrical ground.

7. Using a No. 2 Phillips screwdriver, remove the single screw from the center of the rear panel.

8. Grasp the top cover by the sides and pull it up and toward the front of the computer. Put the cover and its screw aside, taking care not to nick or scratch the cover.

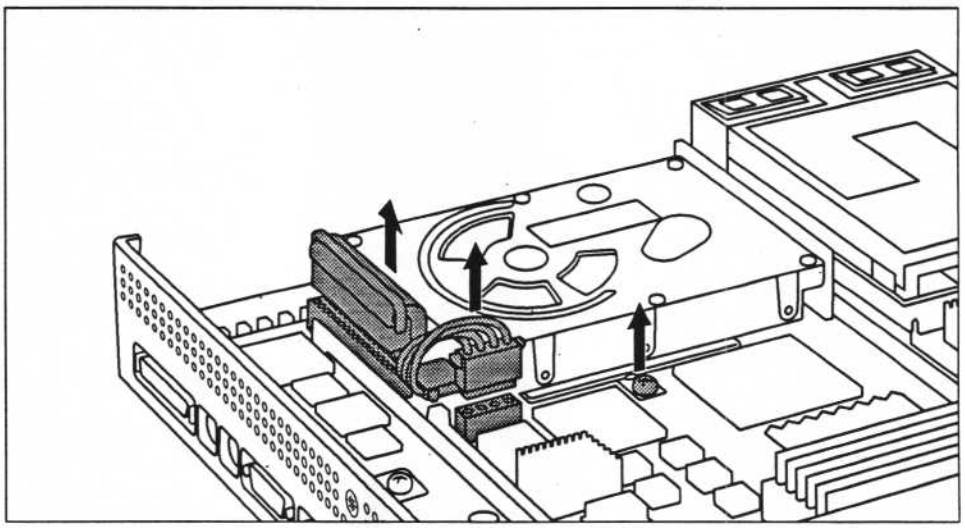


Removing the Disk Drives

1. The hard disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Disconnect the cable where it plugs into the processor board.

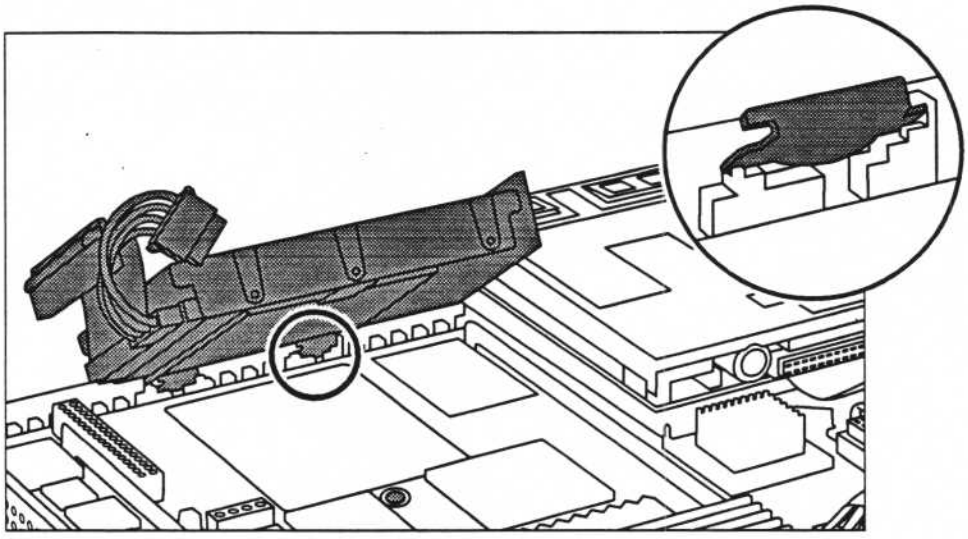
   Some ribbon cables have small straps attached to the connectors to assist in removing the cables from their sockets. Tug on the strap to remove the connector. If the connector is hard to remove, loosen it by rocking the strap up and down and side to side.

2. Unplug the drive's nylon power connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.



3. Using the No. 2 Phillips screwdriver, remove the single screw from the bracket attached to the hard disk drive.

4. Lift the hard disk drive from the computer base assembly by allowing it to pivot up from the two tabs that rest in slots in the base assembly. When the drive is at an angle of about 45 degrees, it will pull free from the computer. Carefully set the drive aside.



5. The floppy disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Disconnect the cable where it plugs into the processor board.

6. Using the No. 2 Phillips screwdriver, remove the single screw from the drive's bracket. If the screw is partially hidden by the ribbon cable, lift the cable to make removal easier.

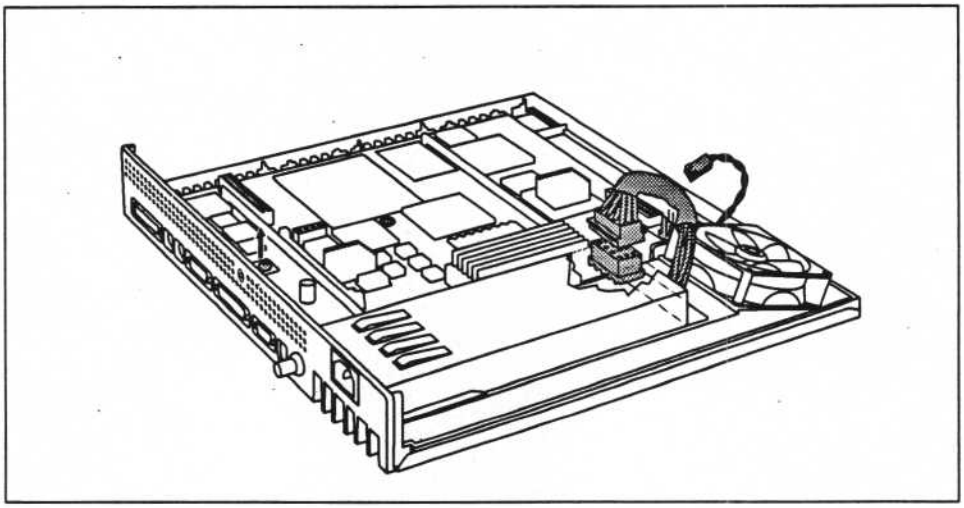
7. Lift the floppy disk drive from the computer base assembly just as you did when removing the hard disk drive. When the drive is at an angle of about 45 degrees, it will pull free from the computer. Carefully set the drive aside.

Replacing the Processor Board

1. Unplug the small fan connector from the processor board. Grasp the plug firmly and pull straight up to disconnect it from the socket.

2. Unplug the nylon power supply connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.

3. Remove the remaining screw from the processor board with the Phillips screwdriver.



4. Lift the front of the processor board slightly and slide it away from the back panel. Place the board, with the side bearing the components face up, on the table or antistatic mat.

5. Carefully remove the RAM memory SIMMs from the old processor board and install them on the new board. Several types of SIMMs are used in NeXTstation and NeXTstation Turbo computers. To avoid problems, install the modules in the same positions on the new board as they occupied on the old one. Make sure the SIMMs are firmly seated in their sockets.

Note: Memory used in the NeXTstation is incompatible with NeXTstation Color, NeXTstation Turbo, or NeXTstation Turbo Color. Do not attempt to interchange memory between these types of systems.

6. Tilt the processor board slightly, aligning the connectors on the edge of the board with the corresponding openings in the rear of the computer base assembly.

7. Carefully pivot the processor board into position, making sure the alignment pins enter the holes on the board. Press the board securely in place.

8. Secure the board to the base assembly with a Phillips screw through the hole in the board near the connectors.

9. Plug the nylon power supply connector into the processor board. Grasp the plug on its sides and firmly push it straight into the socket. The connector is keyed to assure proper polarity.

10. Plug the fan's cable into the processor board. Use care to observe the direction of the notch on the connector.

Reinstalling the Disk Drives

1. Hold the floppy disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

2. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

Warning: All cable connectors and sockets described in the steps below have matching notches or alignment keys to insure proper polarity. If a connector does not mate easily, make sure it is positioned correctly.

3. Orient the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

4. Hold the hard disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

5. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

6. Position the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

7. Connect the drive's power cable to the mating connector on the processor board.

Closing the Computer

In the last steps of the disassembly and reassembly process, you must check your work, close the computer, and reattach the MegaPixel Display and other cables to the system.

Warning: Check your work before closing the NeXTstation or NeXTstation Turbo. Make sure:

- The fan cable is properly connected.

- The disk drives' cables are plugged in.
- All components are properly secured to the base assembly.
- All cables are out of the way of the cover.
- There are no loose screws, tools, or other foreign objects inside the computer.

1. Grasp the top cover by the sides and hold it at a slight angle with the front edge lower than the back.

2. Align the slots inside the front of the cover with the tabs that protrude from the base assembly, and lower the cover into place.

3. Secure the cover to the base assembly with the black Phillips screw.

4. Remove the wrist grounding strap.

5. Reattach the cables (except for the Ethernet network cable) that were connected to the computer, and plug the computer's power cord into its supply. If a printer is connected to the computer, also plug in the printer's power cord. If the system is part of a network, you will need to involve the system administrator prior to reconnecting it to the Ethernet cables.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

Perform the following steps with the system in stand-alone mode (disconnected from the network). If the system is to be attached to an Ethernet network, the system administrator will have to change the network configuration database so the new processor board is recognized by the network. Inform the customer that the system's parameters have been reset to factory defaults; any changes will have to be repeated with the new board installed.

1. Turn on the computer by pressing the Power key on the keyboard. When the login window appears, log in using any valid *local* account. A local account is one like **me**, which is a default local account on all systems and can be accessed when the machine is not on the network. Some systems go directly to the workspace without need for logging in—that's fine.

2. Browse through the files using the File Viewer. You should be able to see and access all the files normally shipped with the system.

3. Insert a floppy disk. Verify that the disk mounts properly and its icon is displayed in the File Viewer. Click its icon to inspect its contents. Eject the disk by clicking Eject under Disk in the Workspace Manager™ menu.

4. Have the customer try to re-create the situation that caused the original request for service. If the customer experienced difficulty when using a particular device or feature, verify that the fault has been corrected.

5. Log out and press the Power key on the keyboard. When the panel appears, click Power Off to turn off the computer.

Upgrading a NeXTstation™ to a NeXTstation Turbo™

April 1992

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Robin Goodwin, Terry Williams
Illustrations by Nancy Serpiello

PN 4227.AA

Upgrading a NeXTstation™ to a NeXTstation Turbo™ computer takes about 25 minutes and consists of the following steps:

1. Opening the computer
2. Removing the disk drives
3. Replacing the processor board
4. Replace the old memory with new
5. Install a new fan
6. Reinstalling the disk drives
7. Closing the computer
8. Verifying system operation

Warning: The processor board, disk drives, and other components in the NeXTstation and the NeXTstation Turbo computer can be damaged by static electricity. Always wear a grounded static wrist strap and practice appropriate static-safe procedures when working inside the computer.

Opening the Computer

1. If the computer is powered on, press the Power key and follow the directions that appear on the screen to turn the computer off.

   If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.

2. If a printer is connected to the computer, unplug the printer's power cord.

3. Unplug the computer's power cord and detach the cables connected to the rear of the computer.

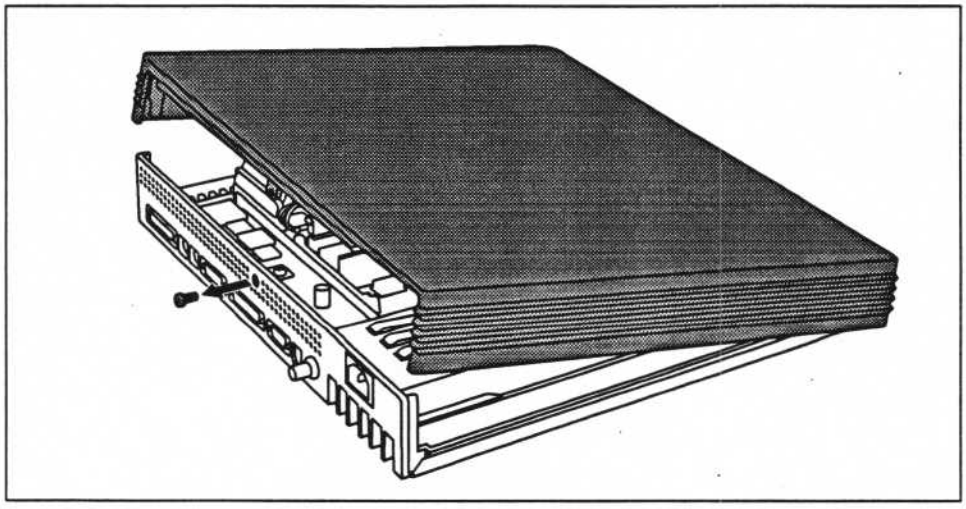
4. If the MegaPixel Display™ is on top of the computer, lift it off and set it out of the way.

5. Put the computer on the worktable.

6. Attach your wrist grounding strap and connect it to a suitable electrical ground.

7. Using a No. 2 Phillips screwdriver, remove the single screw from the center of the rear panel.

8. Grasp the top cover by the sides and pull it up and toward the front of the computer. Put the cover and its screw aside, taking care not to nick or scratch the cover.

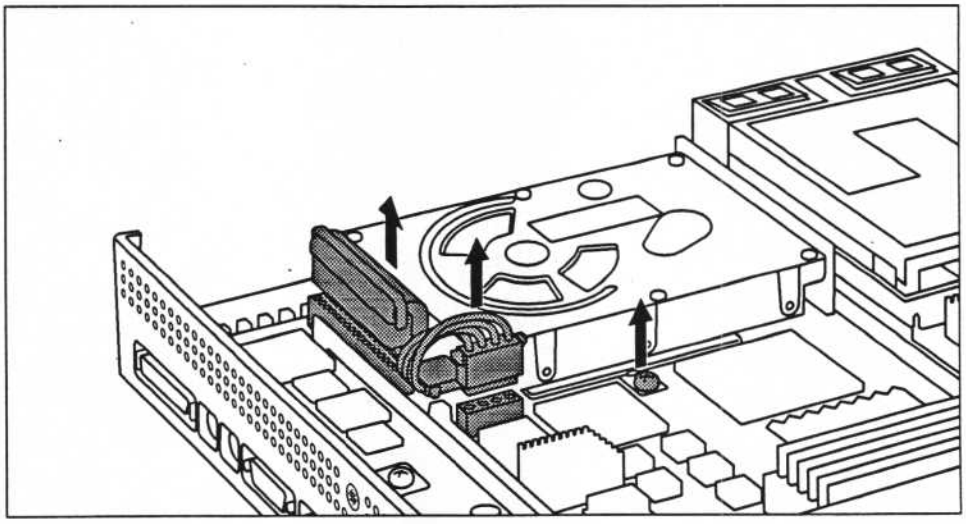


Removing the Disk Drives

1. The hard disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Disconnect the cable where it plugs into the processor board.

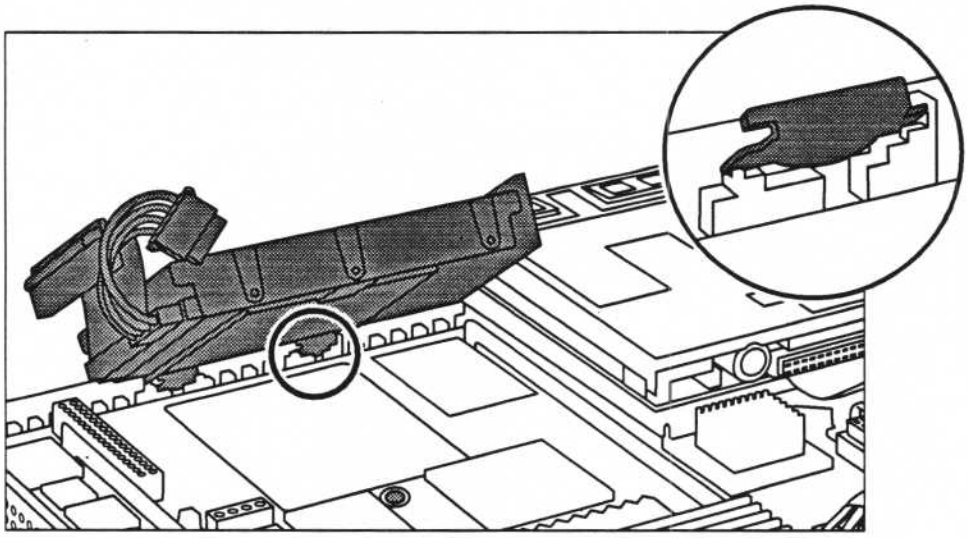
   Some ribbon cables have small straps attached to the connectors to assist in removing the cables from their sockets. Tug on the strap to remove the connector. If the connector is hard to remove, loosen it by rocking the strap up and down and side to side.

2. Unplug the drive's nylon power connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.



3. Using the No. 2 Phillips screwdriver, remove the single screw from the bracket attached to the hard disk drive.

4. Lift the hard disk drive from the computer base assembly by allowing it to pivot up from the two tabs that rest in slots in the base assembly. When the drive is at an angle of about 45 degrees, it will pull free from the computer. Carefully set the drive aside.



5. The floppy disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Disconnect the cable where it plugs into the processor board.

6. Using the No. 2 Phillips screwdriver, remove the single screw from the drive's bracket. If the screw is partially hidden by the ribbon cable, lift the cable to make removal easier.

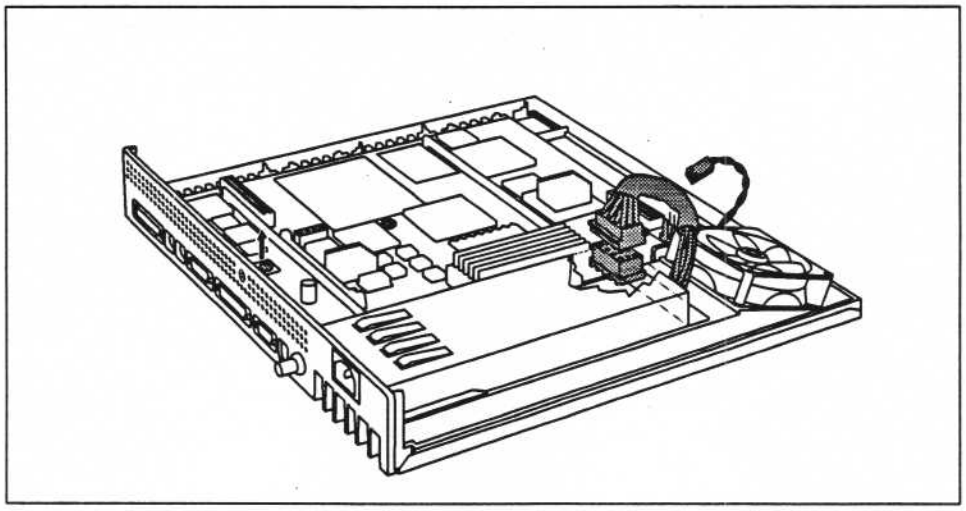
7. Lift the floppy disk drive from the computer base assembly just as you did when removing the hard disk drive. When the drive is at an angle of about 45 degrees, it will pull free from the computer. Carefully set the drive aside.

Replacing the Processor Board

1. Unplug the small fan connector from the processor board. Grasp the plug firmly and pull straight up to disconnect it from the socket.

2. Unplug the nylon power supply connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.

3. Remove the remaining screw from the processor board with the Phillips screwdriver.



4. Lift the front of the processor board slightly and slide it away from the back panel. Place the board, with the side bearing the components face up, on the table or antistatic mat.

5. Exchange SIMMs if necessary. It may not be possible to exchange memory between CPUs. See the note below.

Warning: The 72 pin SIMM sockets in the NeXTstation Color, NeXTstation Turbo, and NeXTstation Turbo Color can be easily broken. Use special care when removing and installing SIMMs in these style sockets.A broken SIMM socket will render that portion of memory inoperative. The CPU must be repaired at the factory.

Note: SIMMs in a NeXTstation are incompatible with NeXTstation Color, NeXTstation Turbo, or NeXTstation Turbo Color. Do not attempt to interchange memory between these systems. Refer to the following table to determine which SIMMs are compatible with your system.

SIMM Compatibility Table

Service Catalog #	SIMM Description	NeXTstation	NeXTstation Color	NeXTstation Turbo	NeXTstation Turbo Color
S7001	1MB non-parity; 36 pins	X			
S7002	4MB non-parity; 36 pins	X			
S7003	4MB parity; 36 pins	X			
S7004	1MB non-parity; 72 pins		X		
S7015	4MB non-parity; 72 pins		X	X	X
S7016	4MB parity; 72 pins		X	X	X
S7018	8MB non-parity; 72 pins			X	X
S7019	8MB parity; 72 pins			X	X

6. Tilt the processor board slightly, aligning the connectors on the edge of the board with the corresponding openings in the rear of the computer base assembly.

7. Carefully pivot the processor board into position, making sure the alignment pins enter the holes on the board. Press the board securely in place.

8. Secure the board to the base assembly with a Phillips screw through the hole in the board near the connectors.

9. Plug the nylon power supply connector into the processor board. Grasp the plug on its sides and firmly push it straight into the socket. The connector is keyed to assure proper polarity.

10. Replace the original fan with the new fan provided in the upgrade kit. Use the No. 2 Phillips screwdriver to remove the original fan's screws. Remove the fan and set it aside.

11. Install the new fan over its air channel. Ensure that the fan airflow exhausts air out through the air channel. A small arrow on the side of the fan will indicate the direction of airflow.

12. Replace the fan screws.

13. Plug the fan's cable into the processor board. Use care to observe the direction of the notch on the connector.

Reinstalling the Disk Drives

1. Hold the floppy disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

2. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

Warning: All cable connectors and sockets described in the steps below have matching notches or alignment keys to insure proper polarity. If a connector does not mate easily, make sure it is positioned correctly.

3. Orient the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

4. Hold the hard disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

5. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

6. Position the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

7. Connect the drive's power cable to the mating connector on the processor board.

Closing the Computer

In the last steps of the disassembly and reassembly process, you must check your work, close the computer, and reattach the MegaPixel Display and other cables to the system.

Warning: Check your work before closing the NeXTstation or NeXTstation Turbo. Make sure:

- The fan cable is properly connected.
- The disk drives' cables are plugged in.
- All components are properly secured to the base assembly.
- All cables are out of the way of the cover.
- There are no loose screws, tools, or other foreign objects inside the computer.

1. Grasp the top cover by the sides and hold it at a slight angle with the front edge lower than the back.

2. Align the slots inside the front of the cover with the tabs that protrude from the base assembly, and lower the cover into place.

3. Secure the cover to the base assembly with the black Phillips screw.

4. Remove the wrist grounding strap.

5. Reattach the cables (except for the Ethernet network cable) that were connected to the computer, and plug the computer's power cord into its supply. If a printer is connected to the computer, also plug in the printer's power cord. If the system is part of a network, you will need to involve the system administrator prior to reconnecting it to the Ethernet cables.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

Perform the following steps with the system in stand-alone mode (disconnected from the network). If the system is to be attached to an Ethernet network, the system administrator will have to change the network configuration database so the new processor board is recognized by the network. Inform the customer that the system's parameters have been reset to factory defaults; any changes will have to be repeated with the new board installed.

1. Turn on the computer by pressing the Power key on the keyboard. When the login window appears, log in using any valid *local* account. A local account is one like **me**, which is a default local account on all systems and can be accessed when the machine is not on the network. Some systems go directly to the workspace without need for logging in—that's fine.

2. Browse through the files using the File Viewer. You should be able to see and access all the files normally shipped with the system.

3. Insert a floppy disk. Verify that the disk mounts properly and its icon is displayed in the File Viewer. Click its icon to inspect its contents. Eject the disk by clicking Eject under Disk in the Workspace Manager™ menu.

4. Have the customer try to re-create the situation that caused the original request for service. If the customer experienced difficulty when using a particular device or feature, verify that the fault has been corrected.

5. Log out and press the Power key on the keyboard. When the panel appears, click Power Off to turn off the computer.

Replacing a NeXTstation™ and a NeXTstation Turbo™ Disk Drive

April 1992

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Robin Goodwin
Illustrations by Nancy Serpiello
Revised by Terry Williams

PN 4225.AA

Replacing the hard disk drive or floppy disk drive in a NeXTstation™ or a NeXTstation Turbo™ computer takes about 15 minutes and consists of the following steps:

1. Opening the computer
2. Replacing the floppy or hard disk drive
3. Closing the computer
4. Verifying system operation

Warning: User files stored on the computer's hard disk will be lost when the hard disk drive is replaced. If you are replacing the computer's hard disk drive and the existing drive is usable, have the user or system administrator save any user files to either the network or floppy disks prior to replacing the hard disk. They can be copied to the new disk after installation.

Warning: The processor board, disk drives, and other components in a NeXTstation computer can be damaged by static electricity. Always wear a grounded static wrist strap and practice appropriate static-safe procedures when working inside the computer.

Opening the Computer

1. If the computer isn't turned off, press the Power key and follow the directions that appear on the screen.

   If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.

2. If a printer is connected to the computer, unplug the printer's power cord.

3. Unplug the computer's power cord and detach the cables connected to the rear of the computer.

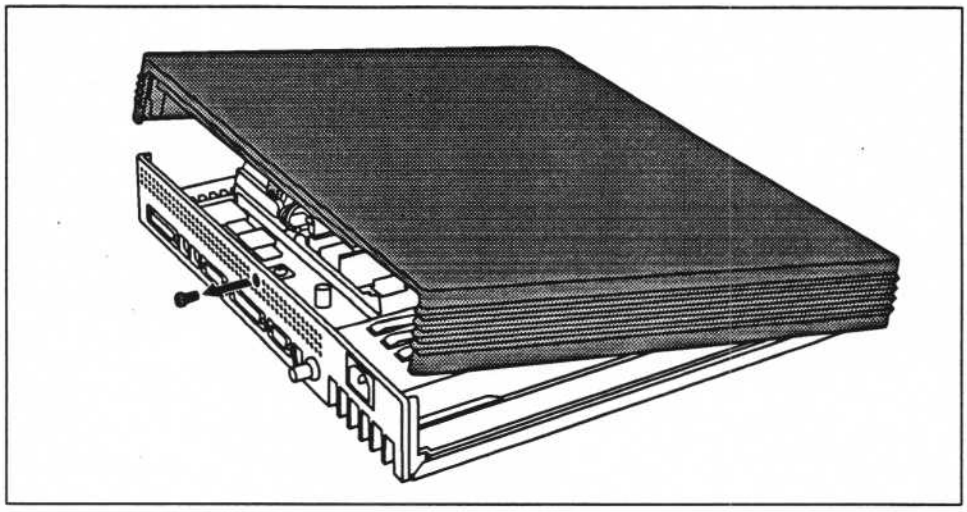
4. If the MegaPixel Display™ is on top of the computer, lift it off and set it out of the way.

5. Put the computer on the worktable.

6. Attach your wrist grounding strap and connect it to a suitable electrical ground.

7. Using a No. 2 Phillips screwdriver, remove the single screw from the center of the rear panel.

8. Grasp the top cover by the sides and pull it up and toward the front of the computer. Put the cover and its screw aside, taking care not to nick or scratch the cover.

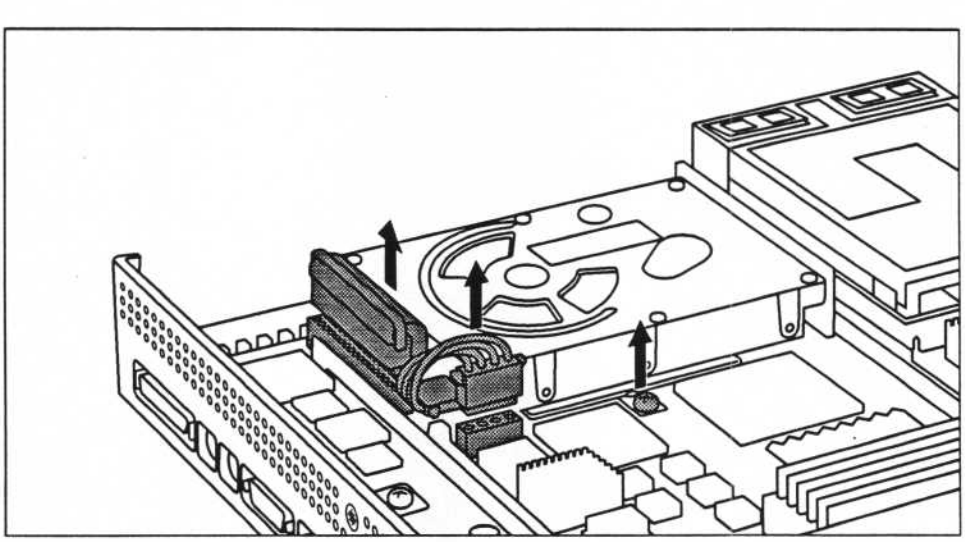


Procedures are given below for replacing the hard disk drive and floppy disk drive. Go directly to the procedure that applies to the activity you are performing.

Replacing the Hard Disk Drive

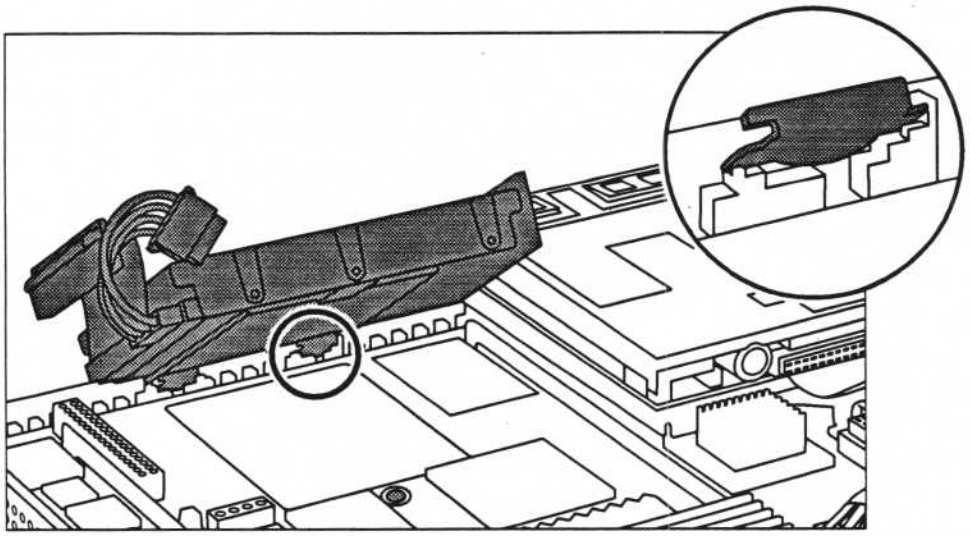
1. The hard disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Tug on the strap to remove the connector. Grasp it firmly and rock it gently to loosen it. Disconnect the cable where it plugs into the processor board.

2. Unplug the drive's nylon power connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.



3. Using the No. 2 Phillips screwdriver, remove the single screw from the bracket attached to the hard disk drive.

4. Lift the hard disk drive from the computer base assembly by allowing it to pivot up from the two tabs that rest in slots in the base assembly. When the drive is at an angle of about 45 degrees, it will pull free from the computer.



5. Remove the ribbon and power cables from the old drive for use on the new one. Grasp the plug on each cable firmly and rock it gently to loosen it, then pull straight up to disconnect it.

6. Remove the bracket from the old drive and attach it to the new one. Use the antistatic bag and protective packaging from the new drive to pack the removed drive for return to NeXT.

Warning: All cable connectors and sockets described in the steps below have matching notches or alignment keys to insure proper polarity. If a connector does not mate easily, make sure it is positioned correctly.

7. Attach the ribbon and power cables to the new drive. The ribbon cable connector without the handle plugs into the drive. Push the connectors straight in, being careful not to bend the pins.

8. Hold the hard disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

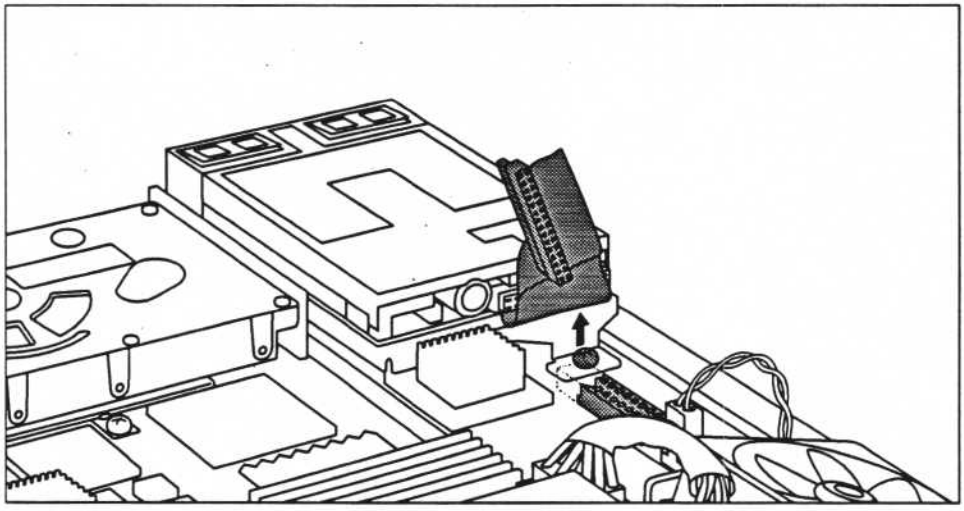
9. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

10. Position the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

11. Connect the drive's power cable to the mating connector on the processor board.

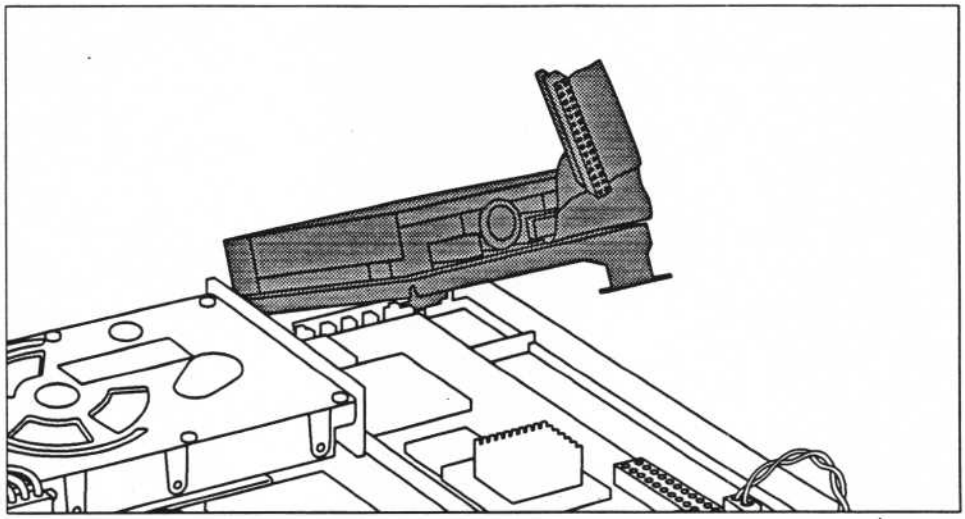
Replacing the Floppy Disk Drive

1. The floppy disk drive is attached to a flat, ribbon-like data cable that connects to the processor board. Disconnect the cable where it plugs into the processor board.



2. Using the No. 2 Phillips screwdriver, remove the single screw from the drive's bracket. If the screw is partially hidden by the ribbon cable, lift the cable to make removal easier.

3. Lift the floppy disk drive from the computer base assembly by allowing it to pivot up from the two tabs that rest in slots in the base assembly. When the drive is at an angle of about 45 degrees, it will pull free from the computer.



4. Remove the ribbon cable from the old drive for use on the new one. Grasp the plug on the cable firmly and rock it gently to loosen it, then pull straight up to disconnect it.

5. Remove the bracket from the old drive and attach it to the new one. Use the antistatic bag and protective packaging from the new drive to pack the removed drive for return to NeXT.

Warning: All cable connectors and sockets described in the steps below have matching notches or alignment keys to insure proper polarity. If a connector does not mate easily, make sure it is positioned correctly.

6. Attach the ribbon cable to the new drive. The ribbon cable connector without the handle plugs into the drive. Push the connector straight in, being careful not to bend the pins.

7. Hold the floppy disk drive at about a 45-degree angle with the mounting tab side down. Guide the tabs into the corresponding slots on the base assembly. Pivot the drive into position and align the hole in the bracket with the screw hole in the processor board and base assembly.

8. Secure the drive to the base assembly with a Phillips screw through the hole in the bracket.

9. Position the drive's ribbon cable connector over the mating connector on the processor board. Push the connector straight in, being careful not to bend the pins.

Closing the Computer

In the last steps of the disassembly and reassembly process, you must check your work, close the computer, and reattach the MegaPixel Display and other cables to the system.

Warning: Check your work before closing the NeXTstation. Make sure:

- The fan cable is properly connected.
- The disk drives' cables are plugged in.
- All components are properly secured to the base assembly.
- All cables are out of the way of the cover.
- There are no loose screws, tools, or other foreign objects inside the computer.

1. Grasp the top cover by the sides and hold it at a slight angle with the front edge lower than the back.

2. Align the slots inside the front of the cover with the tabs that protrude from the base assembly, and lower the cover into place.

3. Secure the cover to the base assembly with the black Phillips screw.

4. Remove the wrist grounding strap.

5. Reattach the cables that were connected to the NeXTstation, and plug the computer's power cord into its supply. If a printer is connected to the computer, plug in the printer's cord.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

1. Turn on the computer by pressing the Power key on the keyboard. When the login window appears, log in using any valid account. Some systems go directly to the workspace without need for logging in—that's fine.

2. Browse through the files using the File Viewer. You should be able to see and access all the files normally shipped with the system.

3. Insert a floppy disk. Verify that the disk mounts properly and its icon is displayed in the File Viewer. Click its icon to inspect its contents. Eject the disk by clicking Eject under Disk in the Workspace Manager™ menu.

4. Have the customer try to re-create the situation that caused the original request for service. If the customer experienced difficulty when using a particular device or feature, verify that the fault has been corrected.

   If something still isn't working properly, you'll need to open the computer and check your work. If the problem persists or if the system fails, you'll have to return to the beginning of the troubleshooting process.

5. Log out and press the Power key on the keyboard. When the panel appears, click Power Off to turn off the computer.

Replacing a NeXTstation™ and a NeXTstation Turbo™ Power Supply

April 1992

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Robin Goodwin
Illustrations by Nancy Serpiello
Revised by Terry Williams

PN 4226.AA

Replacing the power supply in a NeXTstation™ or a NeXTstation Turbo™ computer takes about 10 minutes and consists of the following steps:

1. Opening the computer
2. Replacing the power supply
3. Closing the computer
4. Verifying system operation

Warning: The processor board, disk drives, and other components in a NeXTstation computer can be damaged by static electricity. Always wear a grounded static wrist strap and practice appropriate static-safe procedures when working inside the computer.

Opening the Computer

1. If the computer isn't turned off, press the Power key and follow the directions that appear on the screen.

   If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.

2. If a printer is connected to the computer, unplug the printer's power cord.

3. Unplug the computer's power cord and detach the cables connected to the rear of the computer.

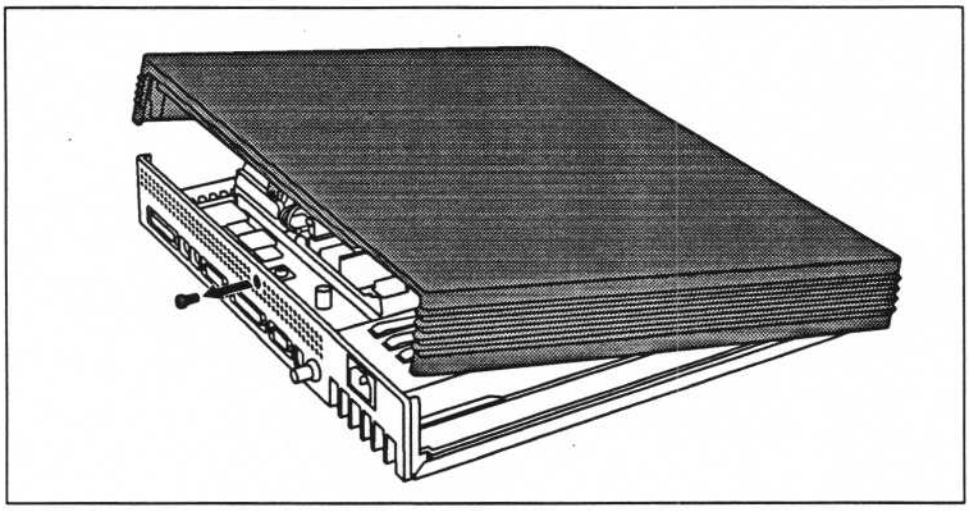
4. If the MegaPixel Display™ is on top of the computer, lift it off and set it out of the way.

5. Put the computer on the worktable.

6. Attach your wrist grounding strap and connect it to a suitable electrical ground.

7. Using a No. 2 Phillips screwdriver, remove the single screw from the center of the rear panel.

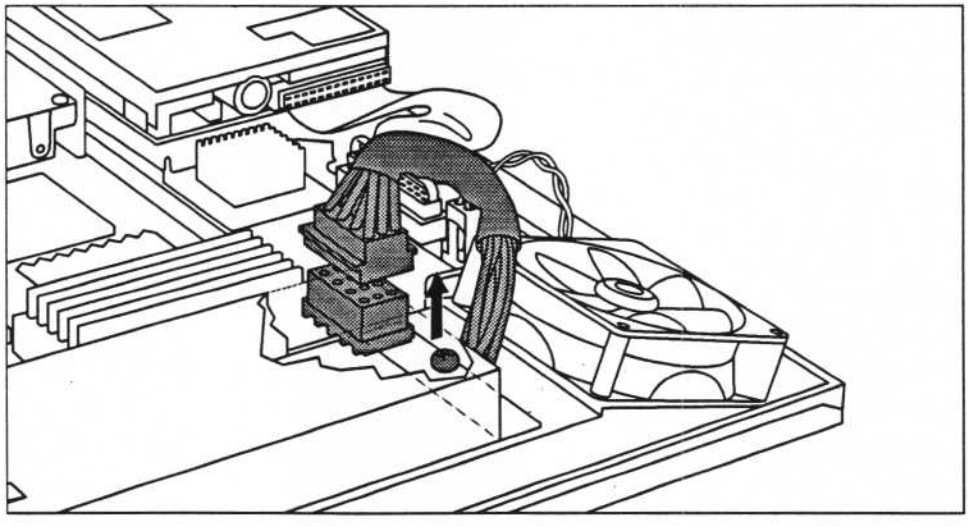
8. Grasp the top cover by the sides and pull it up and toward the front of the computer. Put the cover and its screw aside, taking care not to nick or scratch the cover.



Replacing the Power Supply

1. Unplug the nylon power supply connector from the processor board. Grasp the plug firmly and rock it gently to loosen it, then pull straight up to disconnect it.

2. Hold the cable back against the power supply to provide easy access to the screw below. Remove the screw with a Phillips screwdriver.



3. Slide the power supply toward the front of the computer to release it from the clips that hold it. As the supply comes free, lift it from the base assembly and set it aside.

4. Slide the new power supply toward the rear of the computer, aligning the clips on the bottom bracket of the supply with the slots in the base assembly.

5. Hold the cable back against the power supply and replace the screw that you removed in step 2.

6. Plug the nylon power supply connector into the processor board. Grasp the plug on its sides and firmly push it straight into the socket. The connector is keyed to assure proper polarity.

7. Carefully pack the old power supply in the foam material the new power supply was packed in, so it is not damaged during transit back to NeXT.

Closing the Computer

In the last steps of the disassembly and reassembly process, you must check your work, close the computer, and reattach the MegaPixel Display™ and other cables to the system.

Warning: Check your work before closing the NeXTstation or NeXTstation Turbo. Make sure:

- The fan cable is properly connected.
- The disk drives' cables are plugged in.
- All components are properly secured to the base assembly.
- All cables are out of the way of the cover.
- There are no loose screws, tools, or other foreign objects inside the computer.

1. Grasp the top cover by the sides and hold it at a slight angle with the front edge lower than the back.

2. Align the slots inside the front of the cover with the tabs that protrude from the base assembly, and lower the cover into place.

3. Secure the cover to the base assembly with the black Phillips screw.

4. Remove the wrist grounding strap.

5. Reattach the cables that were connected to the NeXTstation or NeXTstation Turbo, and plug the computer's power cord into its supply. If a printer is connected to the computer, plug in the printer's cord.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

1. Turn on the computer by pressing the Power key on the keyboard. When the login window appears, log in using any valid account. Some systems go directly to the workspace without need for logging in—that's fine.

2. Browse through the files using the File Viewer. You should be able to see and access all the files normally shipped with the system.

3. Insert a floppy disk. Verify that the disk mounts properly and its icon is displayed in the File Viewer. Click its icon to inspect its contents. Eject the disk by clicking Eject under Disk in the Workspace Manager™ menu.

4. Have the customer try to re-create the situation that caused the original request for service. If the customer experienced difficulty when using a particular device or feature, verify that the fault has been corrected.

   If something still isn't working properly, you'll need to open the computer and check your work. If the problem persists or if the system fails, you'll have to return to the beginning of the troubleshooting process.

5. Log out and press the Power key on the keyboard. When the panel appears, click Power Off to turn off the computer.

Replacing a NeXTdimension™ Board

June 1992

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Robin Goodwin
Illustrations by Nancy Serpiello

Revised by Terry Williams

PN 4231.AA

Replacing the NeXTdimension™ board in a NeXTcube computer takes about 20 minutes and consists of the following steps:

1. Opening the computer
2. Replacing the NeXTdimension board
3. Closing the computer
4. Verifying system operation

Warning: The NeXTdimension board, processor board, disk drives, and other components in the NeXTcube or NeXTcube Turbo computer can be damaged by static electricity. Always wear a grounded static wrist strap and practice appropriate static-safe procedures when working inside the computer.

Opening the Computer

1. If the computer isn't turned off, save any open documents, press the Power key, and follow the directions that appear on the screen.

   If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.

2. If a printer is connected to the computer, unplug the printer's power cord.

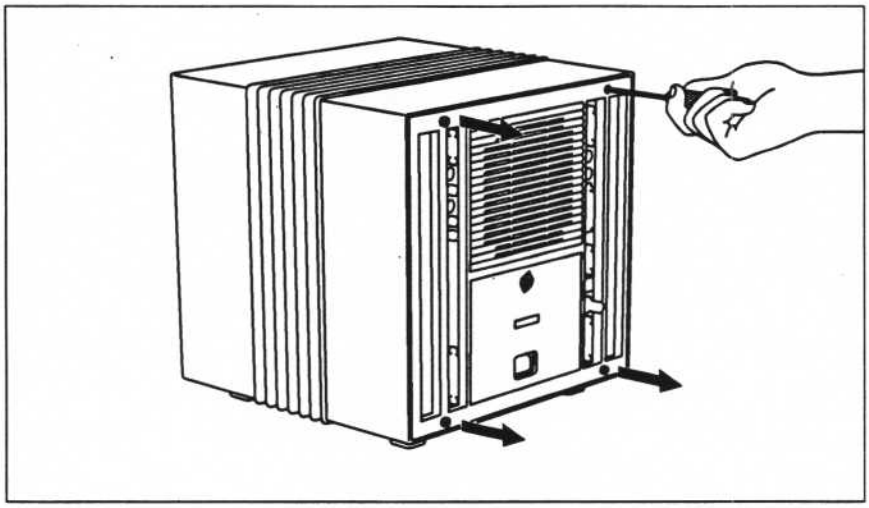
3. Unplug the computer's power cord and detach the cables connected to the rear of the computer.

4. Put the computer on the worktable.

Warning: Always handle the computer and the other parts of the NeXT™ system with care so you don't nick or scratch them. For the same reason, don't rest the computer on its front, rear, or sides, but always keep it standing on its rubber feet.

5. Attach your wrist grounding strap and connect it to a suitable electrical ground.

6. Using the hex wrench, unscrew the four screws that attach the rear panel. The screws are designed to stay in the panel after they are loosened.



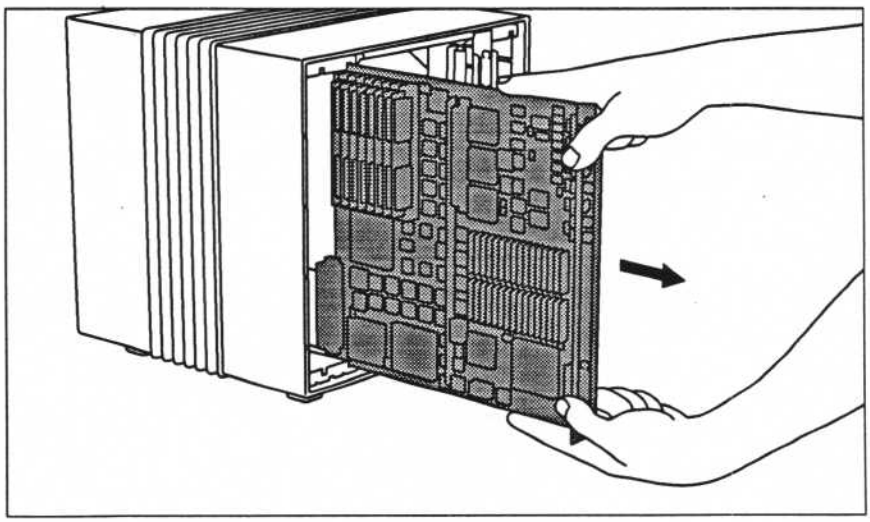
7. Grasp the panel and pull it away from the computer.

8. Lay the panel on the table and unplug the coiled fan cable from the fan by grasping the cable's plug and pulling it away from the fan.

9. Put the panel aside, taking care not to nick or scratch it.

Replacing the NeXTdimension Board

1. Slide the NeXTdimension board out of the computer. Hook your fingers around the plate at the top and bottom of the board to pull it free from its socket at the front of the computer.

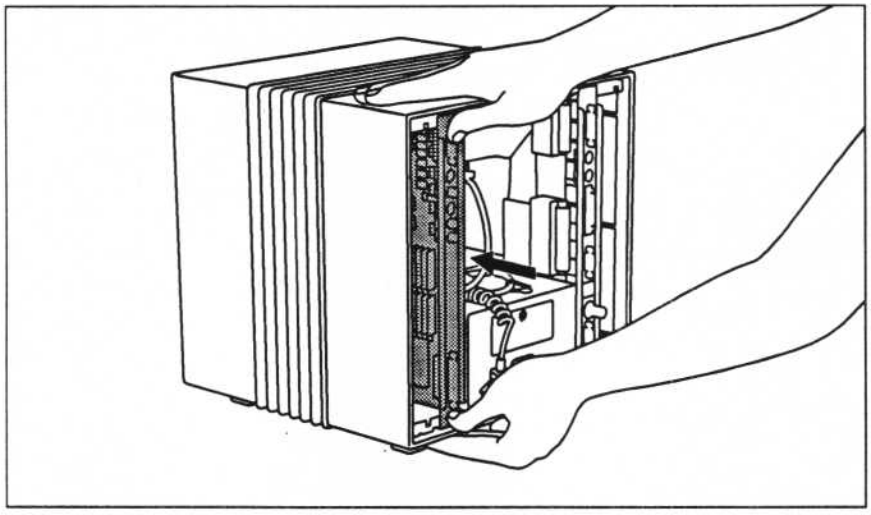


2. Place the NeXTdimension board, with the side bearing the components face up, on the table or antistatic mat.

3. Carefully remove the RAM memory SIMMs from the old NeXTdimension board and install them on the new board. Several types of SIMMs are used in NeXTdimension systems. To avoid problems, install the modules in the same positions on the new board as they occupied on the old one. Make sure the SIMMs are firmly seated in their sockets.

4. Slide the NeXTdimension board all the way into the computer.

The board will slide in easily most of the way, and then stop when it reaches the front of the computer where there's a connector that links it to the circuits in the computer. Push the board to reattach it to the connector. Press firmly on the top and bottom of the metal plate (but don't press on the connectors in the plate) and slide the board in as far as it will go.



Closing the Computer

In the last steps of the disassembly and reassembly process, you must check your work, close the computer, and reattach the MegaPixel Display™ and other cables to the system.

1. Place the computer's rear panel face down on the table in front of the open computer, and reconnect the coiled fan cable. You may see a small + and – on both the cable connector and the fan. Be sure to observe these markings when reconnecting the cable, or the fan will not operate.

Warning: Check your work before closing the computer. Make sure:

- All circuit boards are fully seated in their slots.
- The fan cable is properly connected.
- The disk drive's power and data cables are plugged in.
- Cable clips are properly attached to the assembly wall.
- There are no loose screws, tools, or other foreign objects inside the computer.

2. Put the rear panel back on the computer, slipping the little metal tab at the bottom of the panel into its notch at the base of the computer.

   If the panel doesn't slide in easily, the NeXTdimension board might not be inserted all the way into its slot, or the fan cable or a disk drive data cable might be in the way.

3. Screw on the panel, tightening the screws in diagonal order. Tighten the screws until they fit snugly. Don't screw them in too tightly or they'll be difficult to remove.

4. Remove the wrist grounding strap.

5. Reattach the cables that were connected to the computer, and plug the computer's power cord into its supply. If a printer is connected to the computer, also plug in the printer's power cord.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

1. Turn on the computer by pressing the Power key on the keyboard. When the login window appears, log in using any valid account. Some systems go directly to the workspace without need for logging in—that's fine.

2. Browse through the files using the File Viewer. You should be able to see and access all the files normally shipped with the system.

3. Insert a floppy disk or optical disk (or both, if the system is so equipped). Verify that the disk mounts properly and its icon is displayed in the File Viewer. Click its icon to inspect its contents. Eject the disk by clickingEject under Disk in the Workspace Manager™ menu.

4. Have the customer try to re-create the situation that caused the original request for service. If the customer experienced difficulty when using a particular device or feature, verify that the fault has been corrected.

5. Log out and press the Power key on the keyboard. When the panel appears, click Power Off to turn off the computer.

Repairing and Adjusting a MegaPixel Display

February 1992

We at NeXT Computer have tried to make the information contained in this manual as accurate and reliable as possible. Nevertheless, NeXT disclaims any warranty of any kind, whether express or implied, as to any matter whatsoever relating to this manual, including without limitation the merchantability or fitness for any particular purpose. NeXT will from time to time revise the software described in this manual and reserves the right to make such changes without obligation to notify the purchaser. In no event shall NeXT be liable for any indirect, special, incidental, or consequential damages arising out of purchase or use of this manual or the information contained herein.

NeXT Computer, Inc., 900 Chesapeake Drive, Redwood City, CA 94063.

Manual written by Terry Williams, Eric Domejean
Illustrations by Terry Williams, Eric Domejean, Nancy Serpiello

Replacing an L-board in a MegaPixel Display takes about 20 minutes and consists of the following steps:

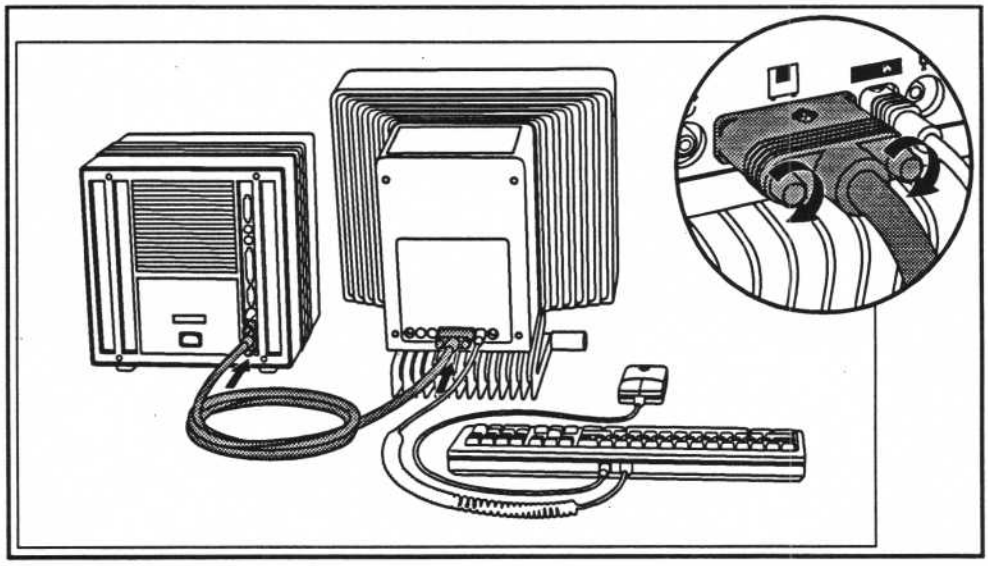
1. Removing the cover of the display.
2. Replacing the L-board.
3. Performing video adjustments.
4. Closing the monitor.
5. Verifying proper operation.

Warning: *Extremely hazardous voltages are present in the MegaPixel Display. Follow these procedures carefully to reduce the risk of injury due to electric shock. The Cathode Ray Tube (CRT) may implode if mishandled. Safety goggles should be worn to protect your eyes. Jewelry should be removed to reduce the possibility of electric shock. Adjustments should be made with an insulated or plastic adjustment tool.*

Opening the MegaPixel Display

1. If the computer isn't turned off, save any open documents, press the Power key, and follow the directions that appear on the screen.

If you can't turn off the computer with the Power key, the computer may be set to disable this function, or the computer has run into a snag and you'll have to turn it off another way. See "Turning Off the Computer" in Chapter 1, "Starting and Ending a Work Session," in the *NeXT User's Reference* manual for details.



2. Unplug the computer's power cord and detach the computer and mouse cables connected to the rear of the monitor. Detach any other cables connected to the back of the monitor.

3. Place the monitor on your workspace and give yourself plenty of room to maneuver the monitor.

4. Place the computer and other equipment aside.

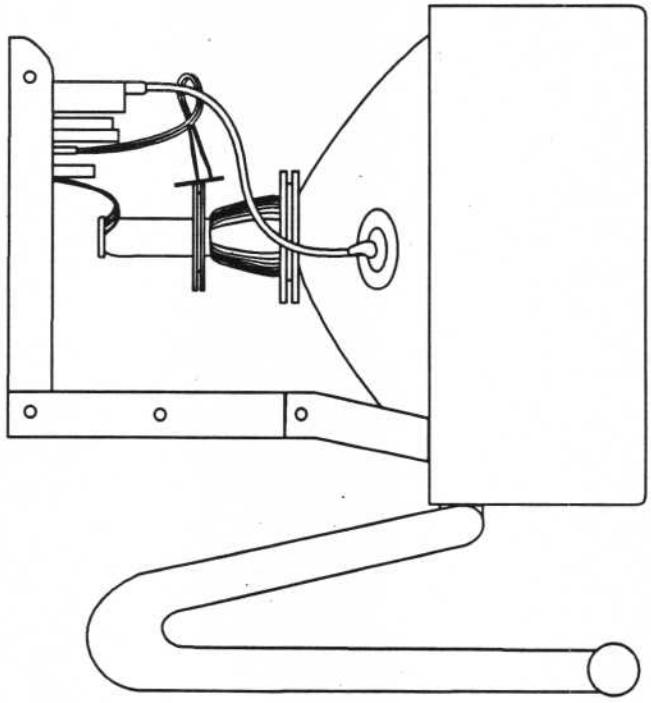
Warning: *Always handle the computer and the other parts of the NeXT™ system with care, so you don't nick or scratch them. For the same reason, don't rest the computer on its front, rear, or sides, but always keep it standing on its rubber feet.*

5. Use a 3mm hex wrench to remove the four screws securing the back cover to the monitor. The srews are not captive and can be easily misplaced or lost if dropped.

6. Remove the back cover by pulling it straight back.

Removing the L-board

The L-board contains all of the video driver electronics that make the MegaPixel display so wonderful. Removal of the L-board is a relatively easy process, however, care must be taken not to damage the CRT. NeXT has taken great care to ensure that harmful voltages will be bled off when system is powered down. So, no special voltage/current bleeding devices are necessary. As a precaution, or in case of failure of the bleeder network, you may want to ground the anode to ensure the anode voltage has been removed.



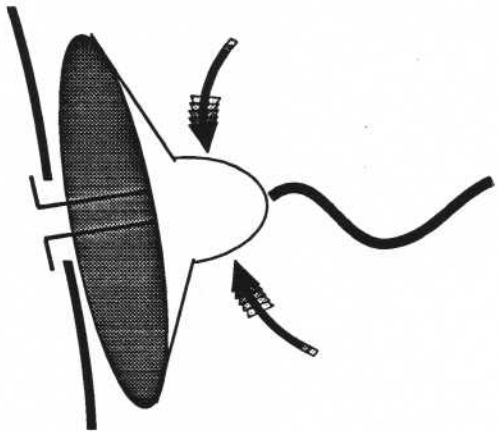
Removing the Anode Voltage from the N4000

Warning: *This procedure is potentially dangerous if not follwed properly. Very high voltages may be present. You should not attempt this procedure unless absolutely necessary.*

Removing the anode voltage can be accomplished by grounding the anode. Ensure that you are properly insulated before attempting this procedure.

1. Remove the side access panel on the left side of the monitor and locate the anode cap.

2. Remove the anode cap by squeezing firmly on the cap to compress the wire clip inside the cap.



3. Connect a medium guage (20 AWG) jumper wire to a good ground source. Connect the other end to the unpainted metal chassis of the monitor.

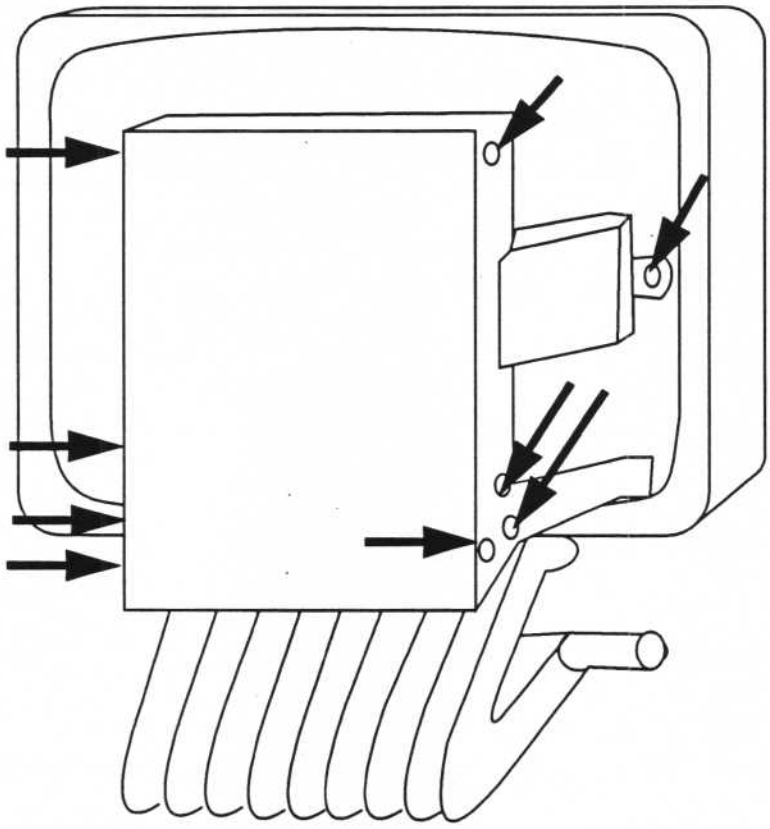
4. Holding only the plastic or rubber handle, insert the tip of a long phillips screwdriver (8 inches or longer) into the hole in the side of the CRT. Then touch the shaft of the screwdriver to the grounded metal chassis of the monitor.

Then anode voltage should now be bled from the anode and the monitor will be safe for removing the L-board.

Removing the L-board from an N4000A MegaPixel Display

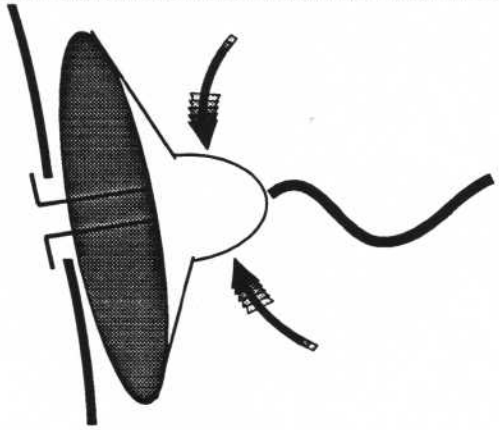
Warning: *The CRT will be exposed and can be damaged or broken if mishandled. You may be injured if the CRT implodes. An implosion will send glass shards and debris in all directions. You should where safety goggles to prevent eye injury. In most cases careful handling and adherence to the instructions will yield perfectly safe results.*

1. Use a No. 2 Phillips screwdriver to remove the screws along the sides of the L-board shroud. You will find a Phillips screw in the anode cap cover on the right side of the monitor that must be removed also.



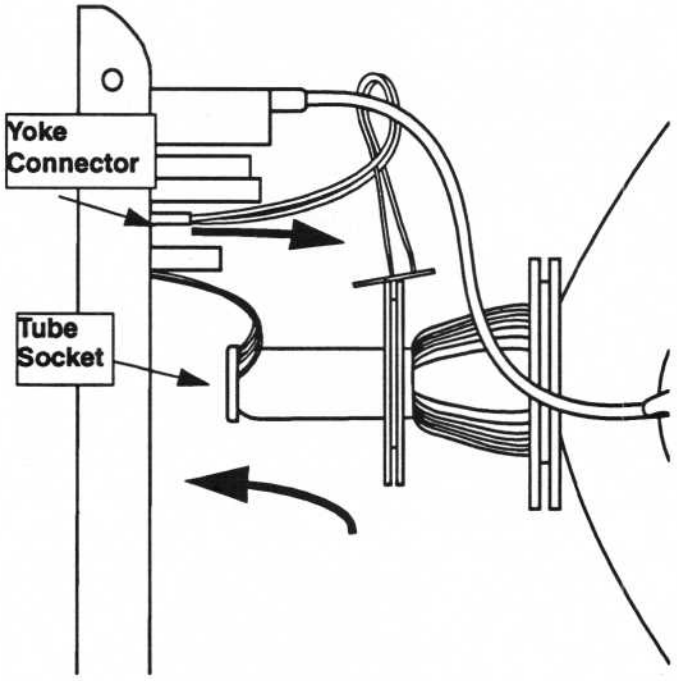
2. Remove the shroud by firmly sliding it up. You may find it necessary to slightly rock the shroud.

3. Remove the anode cap from the right side of the monitor. The anode cap is a red, rubber suction cup that contains a wire clip. Firmly squeeze the anode cap to depress the wire clip leads and extract them from the hole in the side of the CRT.



4. Detach the nylon retaining strap connected to the anode cap wire.

5. Disconnect the tube socket by pulling straight back on the connector at the back of the CRT. The connector is a ring and is keyed for proper removal and installation.



6. Disconnect the yoke connector by removing the flat plastic connector attached to the upper portion of the L-board.

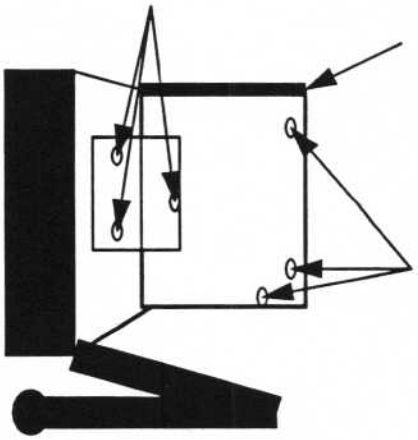
7. Disconnect the microphone connector from the sound board.

8. Remove the two screws in the underside of the CRT housing and slide the L-board straight back freeing it from its rails.

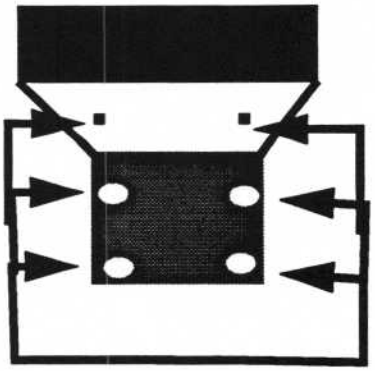
Removing the L-board from the N4000 MegaPixel Display

1. Use a N. 2 Phillips screwdriver to remove the screws from each access panel on the left and right sides of the display.

2. Remove the 4 screws that attach the black painted area of thetop cover.

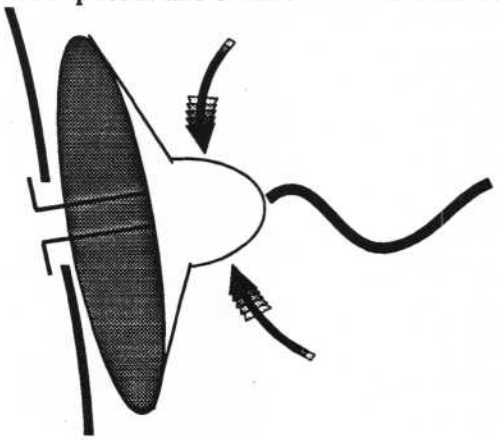


Side view of monitor



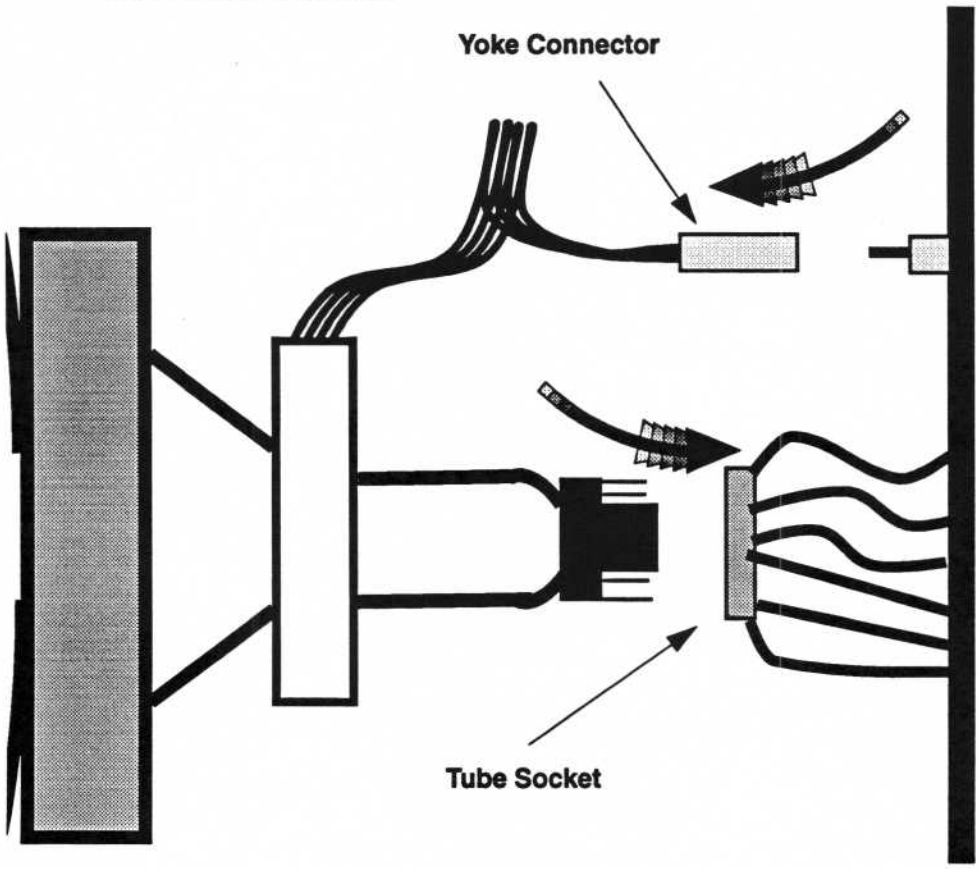
Top View of monitor

3. Remove the anode cap inside the access hole on the right side of the monitor. The anode cap is a red, rubber suction cup that contains a wire clip. Firmly squeeze the anode cap to depress the wire clip leads and extract them from the hole in the side of the CRT.



4. Detach the nylon retaining strap connect to the anode cap wire.

5. Reach inside the access hole to disconnect the tube socket. Pull straight back on the connector at the back of the CRT. The connector is a ring and is keyed for proper removal and installation.



6. Disconnect the yoke connector by removing the flat plastic connector attached to the upper portion of the L-board.

7. Lift slightly on the top cover and hinge the L-board down.

8. Rock the L-board up and down gently to release it from the metal tabs that grasp the L-board mount.

Replacing the L-board

The procedure for replacing the L-board is essentially the reverse of theinstallation procedure.

Installing the L-board on the N4000A MegaPixel Display

1. Slide the L-board into the rails underneath the CRT. Replace the two screws in the bottom of the chassis.

2. Connect the microphone cord to the sound board.

3. Connect the yoke connector.

4. Connect the tube socket.

5. Connect the anode cap. Both prongs of the anode cap clip must be inserted into the hole in the CRT. Squeeze firmly on the rubber cap to get the clip in place. The cap must be firmly seated. If you can easily wiggle the anode cap it is incorrectly installed and the display will not operate properly.

Warning: *Be sure to **manually bled off the anode voltage** if step 4 is performed incorrectly. Very high voltages are associated with the anode. If the display is powered on and the anode cap is incorrectly installed the anode bleeder resistor will be ineffective. A shock hazard exists when the CRT is in this state.*

6. Replace the metal shield.

Installing the L-board on the N4000 MegaPixel Display

1. Guide the leading edge of the L-board inside the metal tab on the monitor chassis.

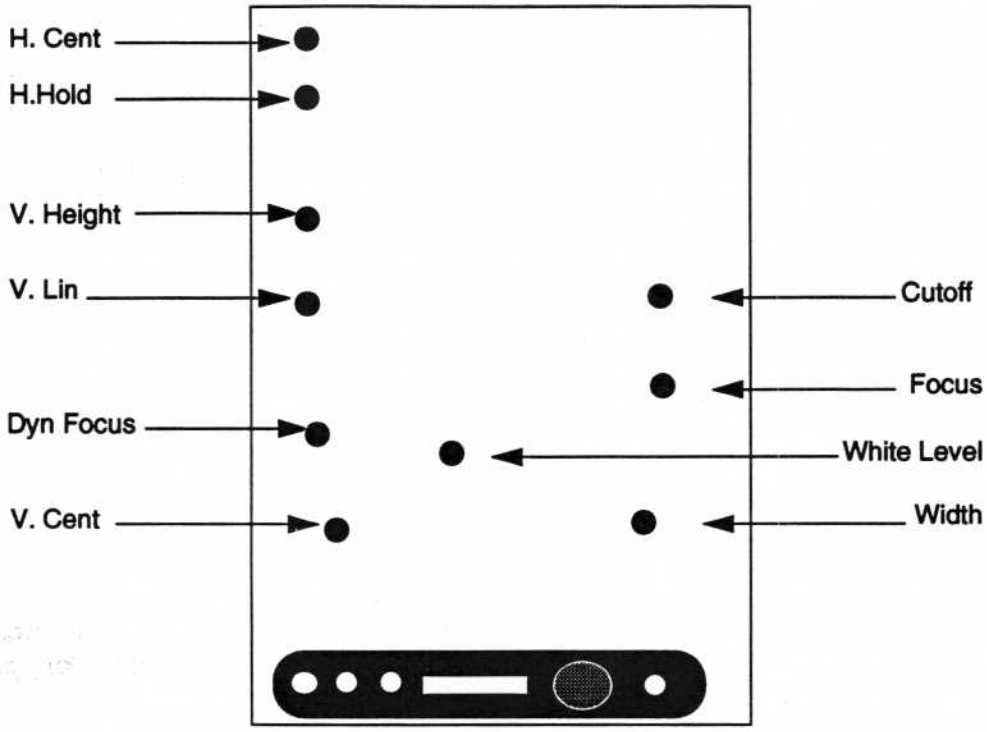
2. Press the L-board into place ensuring that the metal clips engage the L-board mounting bracket. Lift the top cover slightly to ensure that the top edge of the L-board rests underneath the top cover.

3. Replace the screws that hold the L-board assembly in place.

Adjusting the Monitor

Some adjustment of the monitor may be necessary after the new L-board is installed. Before you re-install the bucket, plug in the monitor and keyboard cables and power on the system. **Let the monitor warm up for about 20 minutes before performing any adjustments.**

The adjustment procedures and adjustment controls are identical in both versions of the NeXT MegaPixel monitor.



1. Adjust the Cutoff control by turning it counter clockwise until the black margin of the display turns gray. Adjust Cutoff clockwise until the gray disappears. Turn Cutoff clockwise again 1/8 - 1/4 of a turn.If the display darkens too much, readjust Cutoff to desired threshold.

2. Adjust White Level for desired brightness.

3. Adjust V. Height and Width so that the display area is approximately 23 cm vertically and 31 cm horizontally.

4. Use H. Cent and V. Cent to set the position for the center of the display.

5. Use the Focus control to adjust the focus of the text in all quadrants of the display.

6. Use Dyn Focus if the focus cannot be adjusted by the Focus control.

7. If necessary, adjust V. Lin so icon and text size are consistent throughout the display. Use a measuring stick to verify consistency.

Closing the Monitor

In the last steps of the disassembly and reassembly process, you must check your work, replace the bucket and reattach all cabling.

1. Ensure that all internal monitor cables are correctly installed.
2. Slide bucket L-board onto the rear of the monitor. Make sure that the bucket is fully seated before fastening it down.
3. Replace the 4 screws that attach the bucket..
4. Reattach the cables and power.

Verifying System Operation

No repair is complete until you verify the system's operation. You accomplish this by performing some simple activities to verify that everything is working properly. Involve the customer in this activity whenever possible.

Closing the MegaPixel Display

Closing the Megapixel Display is essentially the opposite of opening one. You will find the process to be relatively simple.

1. Reinstall the back cover and ensure that it is properly seated.
2. Replace the 4 3mm hex screws. Be careful not to over tighten the screws.
3. Replace the monitor cable and the keyboard cable.

Appendix C
Setting the Hard Disk SCSI Address

This document can help configure the SCSI interface target address on your hard disk. The recommended addresses are just that, "recommended." You can use any SCSI address, but we recommend that you set things up in the following way.

Recommended SCSI Addresses

Target ID 0 : Customer External SCSI Bootable SCSI device

Target ID 1 : NeXT internal system bootable SCSI drive

Target ID 2 : Customer's SCSI data disk drive

Target ID 3 : SCSI CD-ROM drive

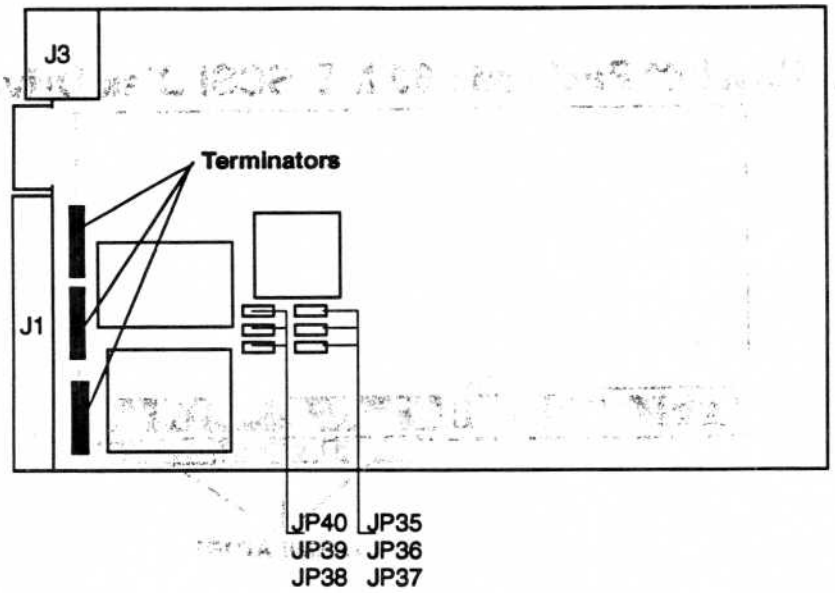
Target ID 4 : PLI external SCSI floppy drive

Target ID 5 : Undetermined (maybe internal SCSI floppy disk drive)

Target ID 6 : Swap space SCSI disk drive

S3001 Maxtor 330 MB SCSI Disk Drive

Maxtor XT-8000S Series Drives
NeXT Service Part numbers
330 MB S3001
660 MB S3002



Component Side of PCB

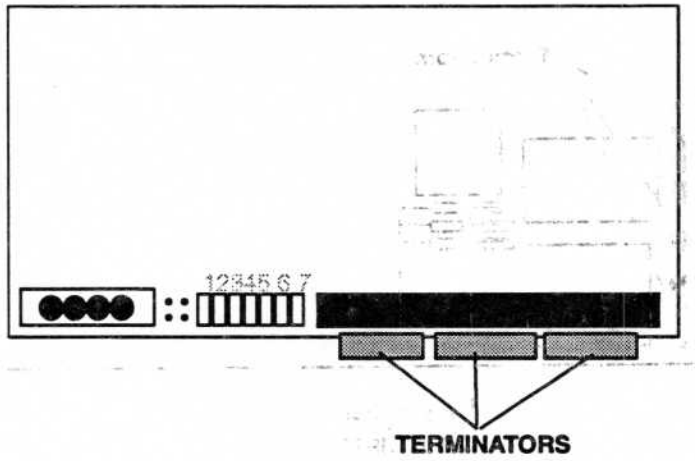
Jumper settings

SCSI ID	JP37	JP36	JP35
0	out	out	out
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

S3002 Maxtor 660MB SCSI Disk Drive

See S3001

S3003 Hewlett Packard 660 MB SCSI Disk Drive



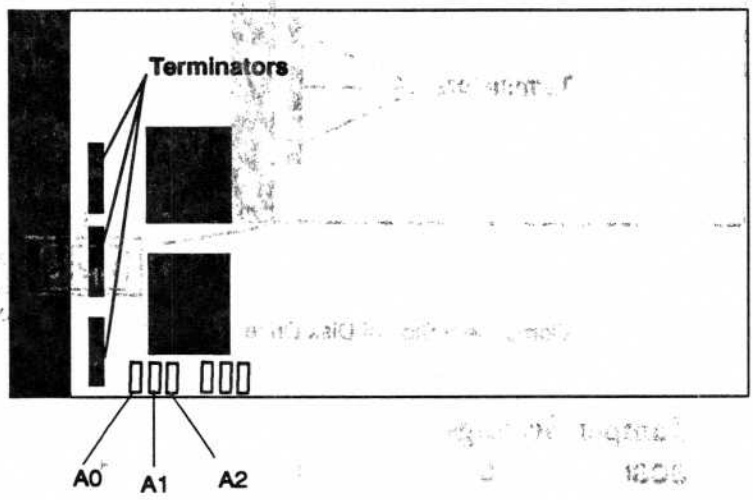
Back of disk drive

Jumper settings

SCSI ID	J5	J6	J7
0	out	out	out
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

S3004 Quantum 105 MB SCSI

Quantum ProDrive Series
NeXT Service Part numbers
105 MB S3004
210 MB S3008



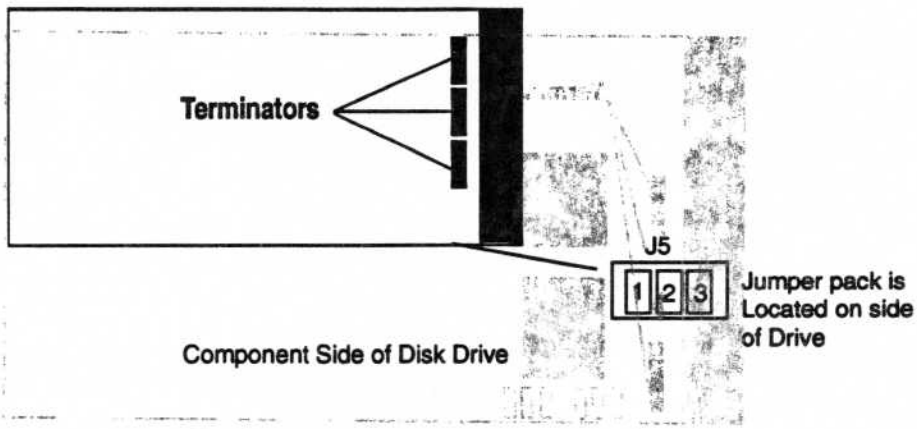
Component side of Drive

Jumper Settings

SCSI ID	A2	A1	A0
0	out	out	out
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

S3005 Seagate Technology 425 MB SCSI Disk Drive

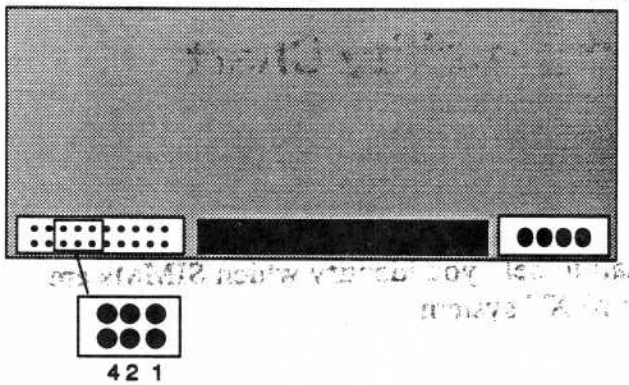
Seagate Tech.
NeXT Service Part numbers
425 MB S3005



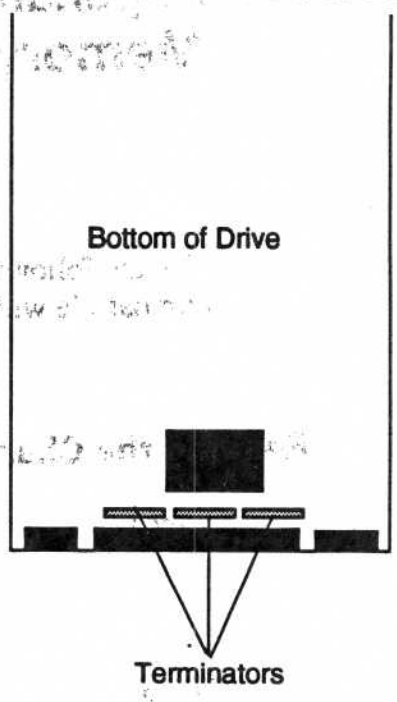
Jumper Settings

SCSI	3	2	1
0	out	out	out
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

S3006 Seagate Technology 1.4 GB SCSI Disk Drive



Back of disk drive



Jumper Settings

SCSI ID	4	2	1
0	out	out	out
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

S3008 Quantum 200 MB SCSI Disk Drive

See S3004

Appendix D
Memory Compatibility Chart

Use the following chart to help you identify which SIMMs are compatible with your NeXT system.

Reading the Chart

S7001	The first column contains catalog numbers that can only be ordered by a NeXT Authorized Service Provider.
N7037	The second column contains part numbers that can be ordered by anyone through NeXT Order Processing.
1 MB non-parity; 30 pins	The next column is a basic description indicating, total memory, parity, no. of connecting pins.
NeXTstation Turbo	The last column shows the compatible NeXT computer.

SIMM Compatibility Chart

Service Catalog number	NeXT Catalog number	SIMM description	NeXTstation	NeXTstation Color	NeXTcube	NeXTdimension	NeXTstation Turbo	NeXTstation Turbo Color	NeXTcube Turbo
S7001	n/a	1 MB non-parity; 30 pins	X		X				
S7002	N7009	4 MB non-parity; 30 pins	X		X				
S7003	N7010	4 MB parity; 30 pins	X		X				
S7004	n/a	1 MB non-parity; 72 pins		X		X			
S7015	N7011	4 MB non-parity; 72 pins		X		X	X	X	X
S7016	n/a	4 MB parity; 72 pins		X		X	X	X	X
S7018	N7034	8 MB non-parity; 72 pins				X	X	X	X
S7019	N7035	8 MB parity; 72 pins				X	X	X	X
n/a	†N7037	32 MB non-parity; 72 pins					x	x	x
n/a	n/a	32 MB parity; 72 pins					x	x	x

†N7037 is not available at the time of printing

Service Catalog parts are available in single unit quantities.

NeXT Catalog parts are sold as upgrade kits of 8 MB and 16 MB total memory.