



## Installing Your Explora 400/450 Network Computer

Part Number 9300586 Rev. A  
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## Revisions

Revision history of this document:

Part Number	Revision Date	Description
9300586	Rev. A October, 1997	First release of this manual for Explora 400/450

## Warnings and Certifications

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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**Declaration of Conformity**

**Manufacturer's Name:** Network Computing Devices, Inc.

**Manufacturer's Address:** 350 N. Bernardo Ave., Mountain View, CA 94043

**Type of Equipment:** X-Terminal

**Model No.:** Xplora and Xplorapro family of bases

**Application of Council Directives:** 89/336/EEC, 73/23/EEC

**Standards to which Conformity is Declared:** EN 55022, EN 50082-1, EN 60950

**Importer's Name:** Network Computing Devices (France) SARL

**Importer's Address:** 5, bis rue de Petit-Robinson, 78353 Jouy-en-Josas cedex, France

We hereby declare the equipment specified above conforms to the above Directives and Standards.

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Jean-Claude Vau, Director, Strategic Sales Manager, NCD (France) SARL, August, 1997

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## **Guidelines for Productive and Healthy Use of Your Network Computer**

You might have read or heard of articles that linked prolonged viewing of computer video displays with eye fatigue, and prolonged use of computer keyboards and mouse devices with repetitive stress injuries such as carpal tunnel syndrome. One common example is the syndrome known as "tennis elbow."

Although a conclusive direct causal relationship between computer use and these adverse health effects has yet to be scientifically proven, NCD recommends that you read and follow these guidelines in setting up and using your new NCD network computer.

- Set up your network computer in a well lit, glare and shadow-free environment.
- Do not use your network computer in a position you find awkward or unnatural.
- Use a chair that provides good lower back support. Adjust your chair so that your feet rest flat on the floor with your thighs in a horizontal position.
- Place your keyboard on a surface so that your wrists are not tilted, or only slightly tilted, while using the keyboard. Many people find a comfortable keyboard height is at the same level as their elbows.
- If the height of your work surface cannot be adjusted, position the chair at a comfortable height and use a footrest to place your feet on a level surface.
- Place your mouse on a surface that is at the same height as your keyboard. Many people find using the mouse and keyboard within 16 inches (0.4 m) of the body is comfortable.
- Avoid resting your arm on your work surface and merely bending your wrist when using your mouse. Consider using a wrist rest to provide a padded surface for your wrists when working with your mouse.
- Place your display monitor at a comfortable viewing distance. Many people favor a distance of 16 to 28 inches (0.4 to 0.7 m) from their eyes. Position the screen so that you are not looking up or down at it.
- Take breaks to rest your eyes, stretch your muscles, and move around.
- Vary your work patterns so that you alternate working at your computer with other tasks that use different muscle groups and allow you to focus your eyes at different distances.
- See your physician if you experience persistent muscle ache, joint pain, eye fatigue or other discomfort when using your network computer.

These are guidelines. What is comfortable for some might not be comfortable for you. You are the only one who can decide if these guidelines are appropriate for your needs.

### **What about electromagnetic emissions from your monitor?**

Many objects we encounter in our everyday lives produce very low frequency (VLF) and extremely low frequency (ELF) electromagnetic emissions. These objects include such common appliances as portable cellular telephones, televisions, toasters, electric blankets, and video display terminals (VDT) such as the monitor that is part of your network computer. VDTs have been the focus of a growing controversy over the potential health effect of VLF and ELF emissions.

NCD is monitoring this issue and shares the public's concern over the potential health consequences of exposure to VLF and ELF emissions from VDTs. To date, the research and testing on this subject is inconclusive. Moreover, the link, if any, between VDT emissions and adverse health effects is unproven and the subject of much debate. Stress, postural strain, and poor working conditions are frequently cited in addition to, or instead of, VDT emissions as posing potential health hazards to frequent users of VDTs.

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The prevailing professional opinion to date is that VDTs are safe. NCD products comply with the applicable regulations and standards for electromagnetic radiation set forth by the U.S. Code of Federal Regulations, Underwriters Laboratories, Inc., the Canadian Standards Association, and the German VDE Standard. When and if new or additional standards are adopted, NCD will take appropriate steps to comply with them.

Even though the preponderance of professional opinion is that VDTs are safe, some of our customers have asked us for information on how to reduce their exposure to VLF and ELF emissions. Although NCD does not endorse the following as having health benefits, the easiest and perhaps most economical and effective measures are to turn off your display when not in use, to position your display at arm's length, and to avoid working in areas where you are positioned close to the rear of a VDT (where the emissions are strongest). Also, shields are available from third party vendors that reduce glare and electric emissions.



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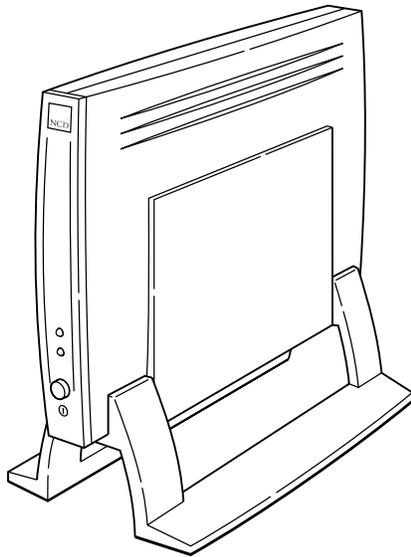
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# 1 About the Explora 400/450 Series

The Explora 400/450 Series network computers (NCs) consist of a circuit board in one of two bases, a monitor, a mouse, and a keyboard. You can purchase the NC alone or with a monitor.

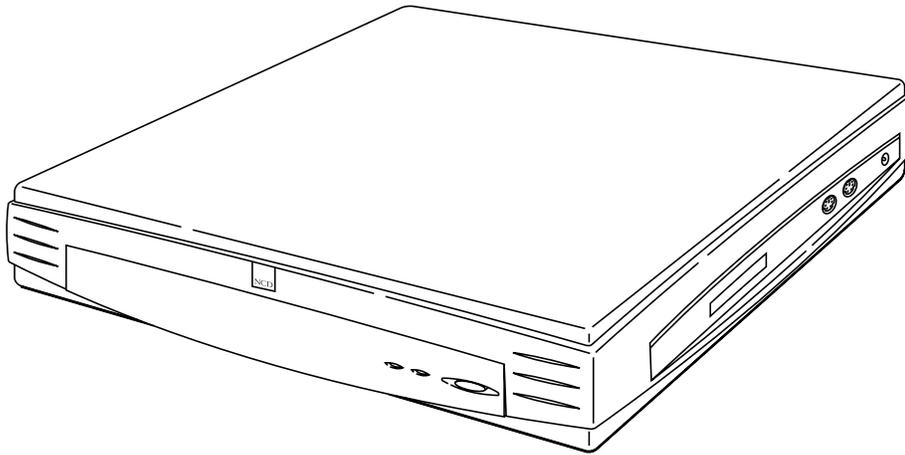
The two bases are:

- ❑ The space-saver base, shown in Figure 1-2, has an ergonomic design with as small a footprint as possible, making it ideal for environments where space is at a premium.



**Figure 1-1 Explora 400/450 Series Space-Saver Base in its Stand**

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- ❑ The monitor support base, shown in Figure 1-2, supports the weight of a color monitor.



**Figure 1-2 Explora 400/450 Series Monitor Support Base**

The Explora 400/450 NCs are advanced network computers that include the following features:

- ❑ VGA/SVGA/XGA/SXGA monitor support
- ❑ PS/2 mouse support
- ❑ Multiple keyboard choices
- ❑ Serial (RS-232 C) port
- ❑ Parallel port
- ❑ Externally accessible PCMCIA card (also called PC card) slot
- ❑ Audio output (except on the Explora 450 with the optional thin coax Ethernet connection)
- ❑ ENERGY STAR compliance for energy efficiency

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Table 1-1 compares the features of the Explora 400 to the Explora 450 features.

**Table 1-1 Feature Comparison**

<b>Feature</b>	<b>Explora 400</b>	<b>Explora 450</b>
CPU	PowerPC 403GA, 33 MHz	PowerPC 403GCX, 66 MHz
Memory	8 MB standard, 128 MB maximum, fast-page mode	8 MB standard, 128 MB maximum, EDO-mode
Graphics	S3 TRIO64V2/DX, 1 MB EDO DRAM, used as a frame buffer, 1152x900 maximum	S3 TRIO64V2/DX, 2 MB EDO DRAM, used as a frame buffer, 1280x1024 maximum
Networking	Twisted-pair 10BaseT Ethernet	Twisted-pair 10/100BaseTX Ethernet standard and optional thin coax Ethernet in place of audio output

**Note** The label on the underside of the space-saver base shows the following:

- Explora 400 as the Model 401
- Explora 450 with stereo audio output as the Model 451
- Explora 450 with the optional thin coax Ethernet in place of the stereo audio output as the Model 453

The label on the underside of the monitor support base shows the following:

- Explora 400 as the Model 402
- Explora 450 with stereo audio output as the Model 452
- Explora 450 with the optional thin coax Ethernet in place of the stereo audio output as the Model 454

As an ENERGY STAR Partner, Network Computing Devices, Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

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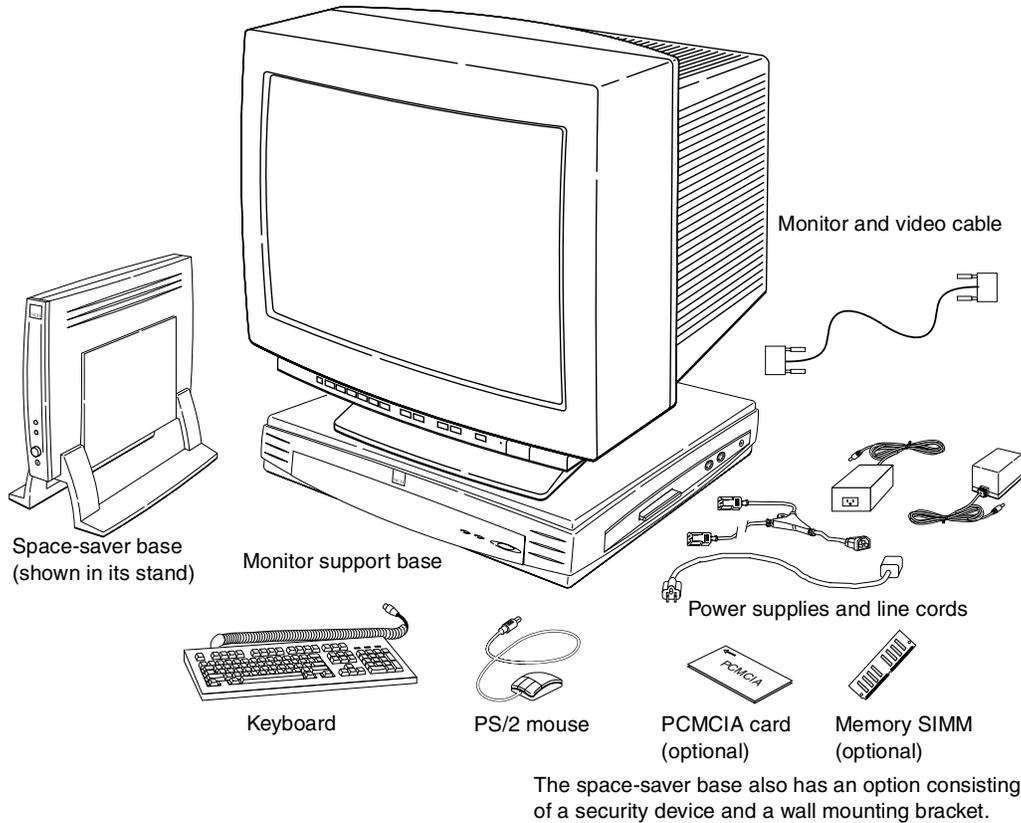
Table 1-2 lists the physical dimensions of both bases.

**Table 1-2 Explora 400/450 Dimensions**

<b>Dimension</b>	<b>Space-Saver Base</b>	<b>Space-Saver Base in Stand</b>	<b>Monitor Support Base</b>
Height	1.9 inches (4.8 cm)	9.6 inches (24.4 cm)	2.1 inches (5.3 cm)
Width	7.6 inches (19.3 cm)	5.5 inches (13.9 cm)	12.8 inches (32.5 cm)
Depth	11.3 inches (28.7 cm)	11.3 inches (28.7 cm)	13.2 inches (33.5 cm)
Weight	2.6 pounds (1.2 kg)	2.8 pounds (1.3 kg)	5.5 pounds (2.5 kg)

## 2 Explora 400/450 Series Product Line

Figure 2-1 shows both Explora 400/450 bases and all its components, including options.



**Figure 2-1 Explora 400/450 Series Components**

Unpack the shipping cartons and make sure you have all of the standard components and any optional components that you ordered. If any components are missing or appear damaged, contact NCD at (650) 691-7445 or your representative immediately.

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**2-2 Explora 400/450 Series Product Line**

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## 3 Basic Installation

This section describes the location of Explora 400/450 connectors, controls, and indicators, and illustrates the installation of the base.



To prevent electric shock or fire hazard, do not expose the power supply, NC, monitor line cord, or monitor to rain or moisture.



*Do not* set the monitor on the space-saver base. The space-saver base is not designed to support the weight of a monitor.

Use the NC only in an office or business environment. Do not subject the NC to vibration, dust, or corrosive gases because the NC is not designed to be used in such environments.

Keep the NC in a well-ventilated area. Do not cover the NC or place anything against the ventilation holes. Ventilation holes are on the cover to prevent the internal temperature from rising. Do not allow anything to fall in the ventilation holes.

Keep the NC away from heat sources, including direct sunshine or heating appliances. The maximum operating temperature is 40°C (104°F).

## Connectors



**Before connecting any cables, make sure the power is off.**

**Do not connect any power cords to the Explora 400/450 unless the monitor, keyboard, and mouse are properly connected.**

If you are installing additional memory in your NC, do not complete the basic installation until you have installed the memory. Go to “Installing Optional Equipment in the Space-Saver Base” on page 5-1 or “Installing Optional Equipment in the Monitor Support Base” on page 6-1.

With one exception, the connectors are the same for the Explora 400 and Explora 450:

- Explora 400 always has a stereo audio output connector.
- Explora 450 has the stereo audio output connector as standard. You can order the Explora 450 with an optional thin coax Ethernet connector in place of the stereo audio output connector.

Figure 3-1 on page 3-3 shows how to connect components to the space-saver base connectors. Figure 3-2 on page 3-4 shows how to connect components to the monitor support base connectors.

Connect the following to the NC:

- Keyboard
- Mouse
- Monitor
- Network
- Audio, if used
- Serial and/or parallel devices, if used

To connect the power supply, follow the instructions in “Power Connections” on page 3-5.

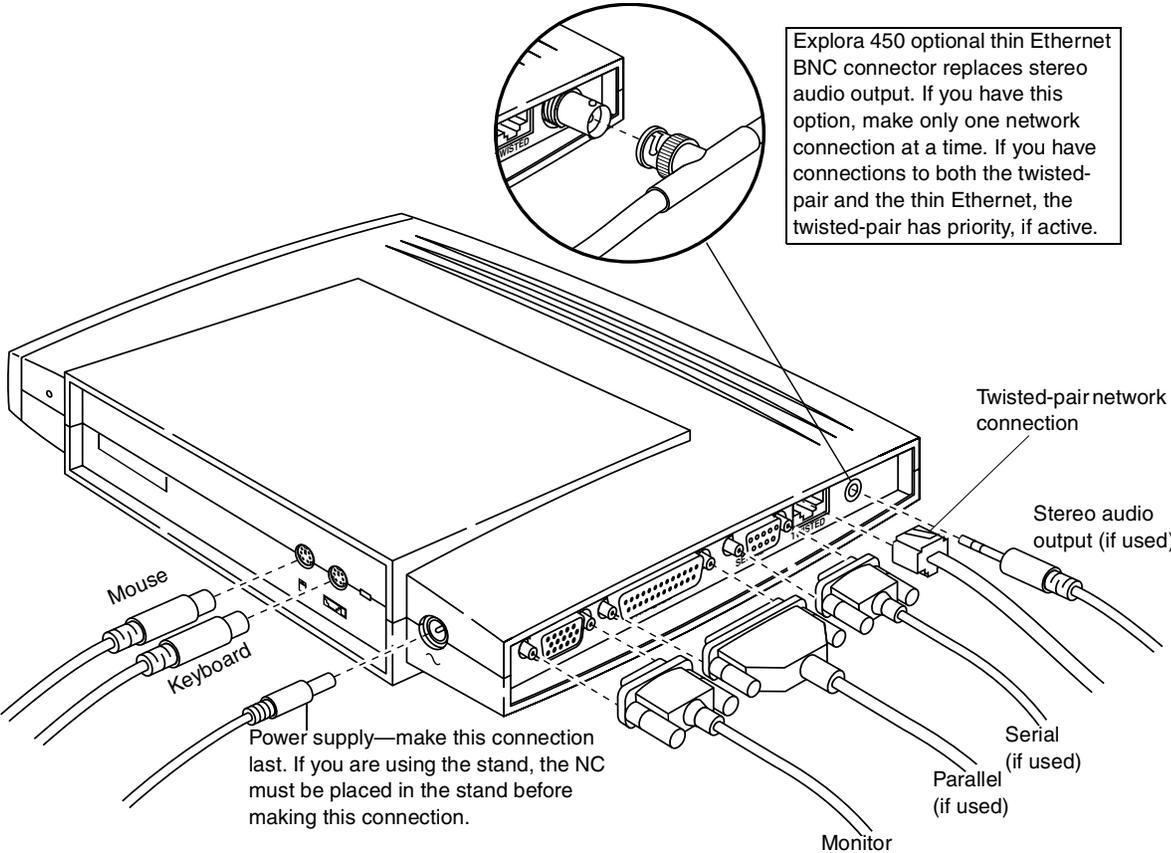


Figure 3-1 Explora 400/450 Connectors (Space-Saver Base)

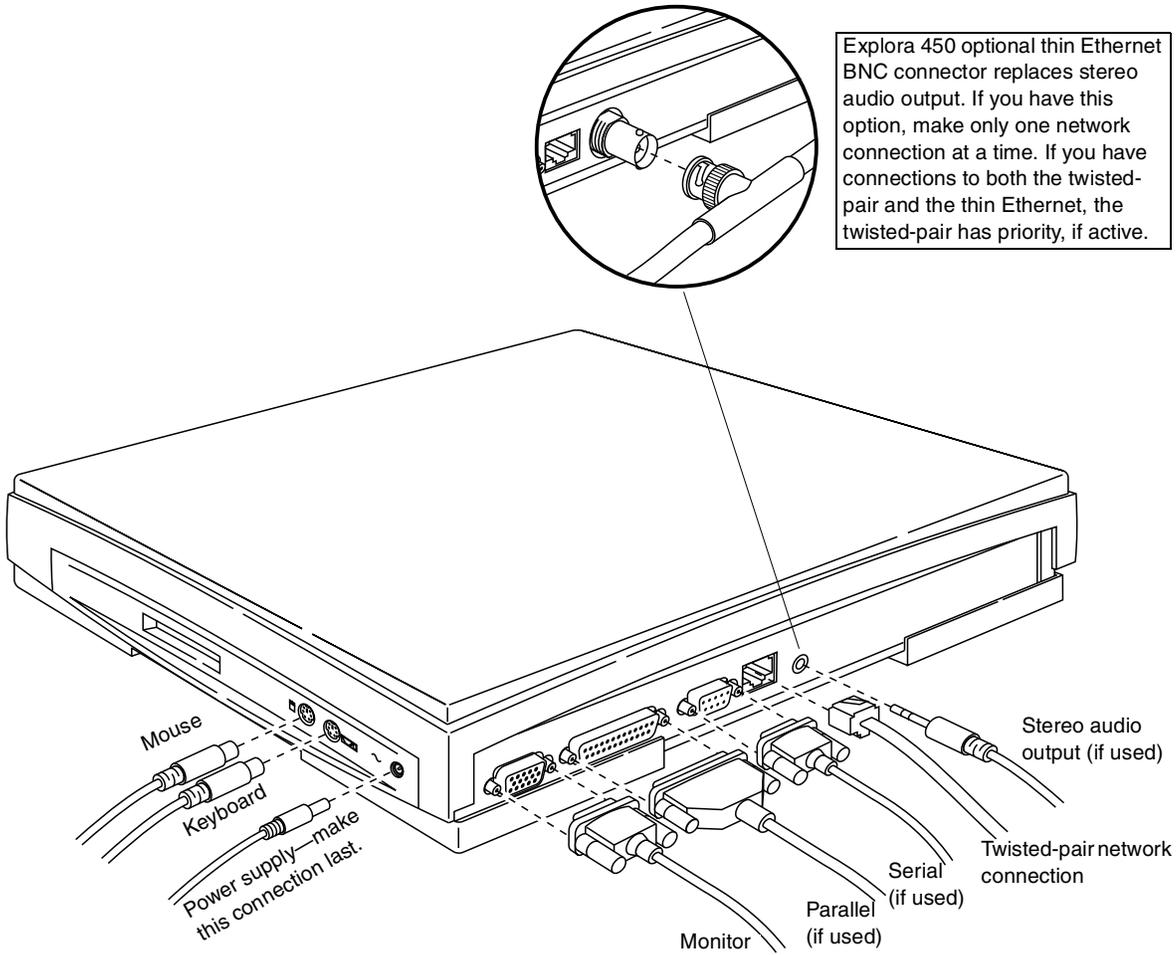


Figure 3-2 Explora 400/450 Connectors (Monitor Support Base)

3-4 Basic Installation

## Power Connections



**Carefully observe these power connection instructions. Failure to follow these instructions can cause fire or electric shock hazard.**

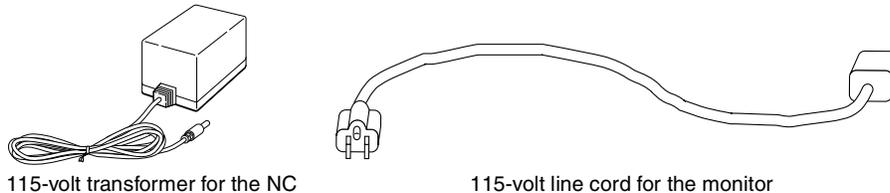
Make sure that all other connectors are in place before making the power connections.

If you are using the space-saver base in its stand, place the base in the stand before making the power connection. The stand has two supports, one support has a large hole in it while the other support has a small hole. Orient the stand so that the support with the large hole aligns with the power connector.

### Power Connections for Inside the USA

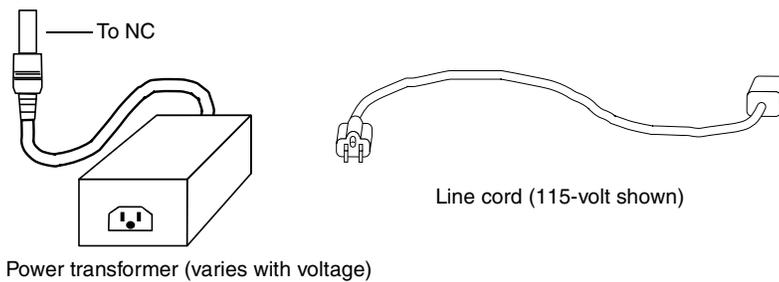
There are three different sets of power components available if you ordered your NC for use inside the USA:

1. A 115-volt power transformer for the NC that plugs directly into the wall outlet and a 115-volt line cord for the monitor. (See Figure 3-4.)



**Figure 3-3 Wall-Plug Transformer and Line Cord**

2. A 115-volt power transformer that requires a line cord and two 115-volt line cords, one line cord for the power transformer and one for the monitor. (See Figure 3-4.)



**Figure 3-4 Transformer and Line Cord**

The line cords are UL Listed and CSA Certified cord sets rated minimum 7 amps, 125 volts, which consists of minimum 18 AWG, type SVT or SJT, three conductor cordage maximum 15 feet in length, terminating in a NEMA 5-15P plug.

3. An optional Y-cable. If you have this option, see either “Installing Optional Equipment in the Space-Saver Base” on page 5-1 or “Installing Optional Equipment in the Monitor Support Base” on page 6-1.

## Power Connections for Outside the USA

If you ordered your NC for use outside the USA, you received either the optional Y-cable with a power transformer and one line cord or the following items: power transformer that requires a line cord for your voltage and two line cords. (See Figure 3-4.)

The line cords are rated minimum 10 amps, 250 volts, with the appropriate safety approvals for the country in which the equipment will be installed. The cordage should be marked <HAR> and terminate in a grounding type attachment plug. If you are in the UK, see “Power Cord for the UK” on page 3-7.”

If you have the optional Y-cable, see either “Installing Optional Equipment in the Space-Saver Base” on page 5-1 or “Installing Optional Equipment in the Monitor Support Base” on page 6-1.

### Power Cord for the UK

The detachable mains lead on this equipment is supplied with a moulded plug incorporating a fuse, the value of which is indicated on the pin face of the plug. Should the fuse need to be replaced, an ASTA or BSI approved BS 1362 fuse must be used of the same rating. The fuse cover is detachable. Never use the plug with the cover omitted.

### Controls and Indicators

The controls and indicators are the same for the Explora 400 and Explora 450. They are shown in Figure 3-5 and Figure 3-5 on page 3-7.

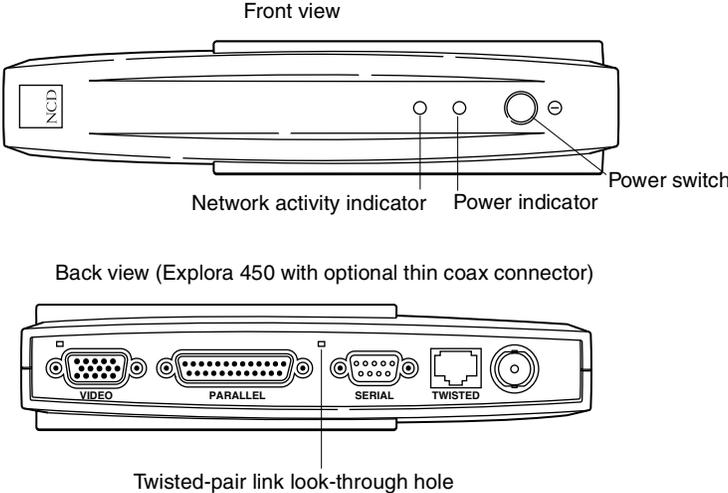
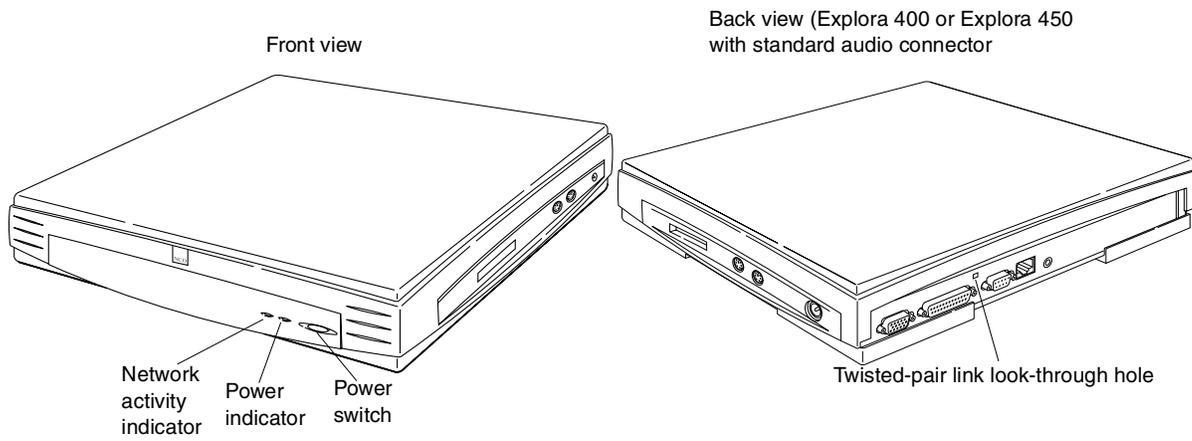


Figure 3-5 Explora 400/450 Controls and Indicators (Space-Saver Base)

## Controls and Indicators

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**Figure 3-6 Explora 400/450 Controls and Indicators (Monitor Support Base)**

### 3-8 Basic Installation

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## 4 Selecting Screen Resolution

If your monitor complies with automatic detection (DDC or display data channel), your monitor automatically uses the highest resolution and refresh rate that fits in the available frame buffer. If you want to select another resolution or refresh rate, use these instructions.

If your monitor does not comply with automatic detection, when you first turn the NC on, the display uses a default resolution that depends on the installed video cable and monitor capabilities. Your monitor might not support this setting or this setting might not provide the highest resolution and refresh rate that your monitor supports. Refer to your monitor documentation for its supported resolutions.

The Boot Monitor provides a menu that selects the correct resolution and changes the dpi (dots per inch) setting for the monitor.



**If you are using third-party monitors, you might damage your monitor by selecting the wrong screen resolution. Make sure your monitor supports your selection.**

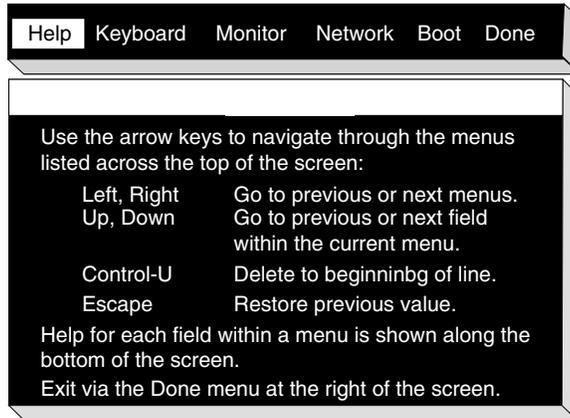
**If you are using NCD monitors, you will get a blank screen if you select a screen resolution that is outside the range of your monitor.**

To change the resolution:

1. Turn on the system or reboot (if the system is already on).
2. After the Boot Monitor title and version number, messages similar to the following appear. Press the Escape key to interrupt the booting process and access the Boot Monitor prompt (>).

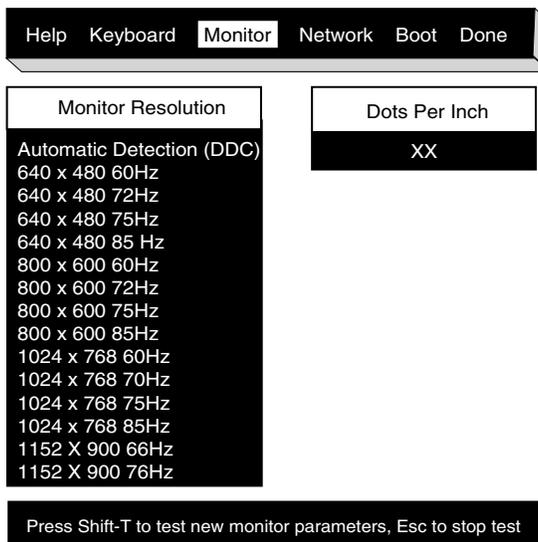
```
Searching for IP address...
Using IP address IP address of terminal
Searching for subnet mask
Using subnet mask subnet mask
..... (Press Escape to interrupt booting.)
>
```

- When you are in the Boot Monitor (> prompt), press the Setup key or type **se <CR>**. The Main menu appears. (See Figure 4-1.)



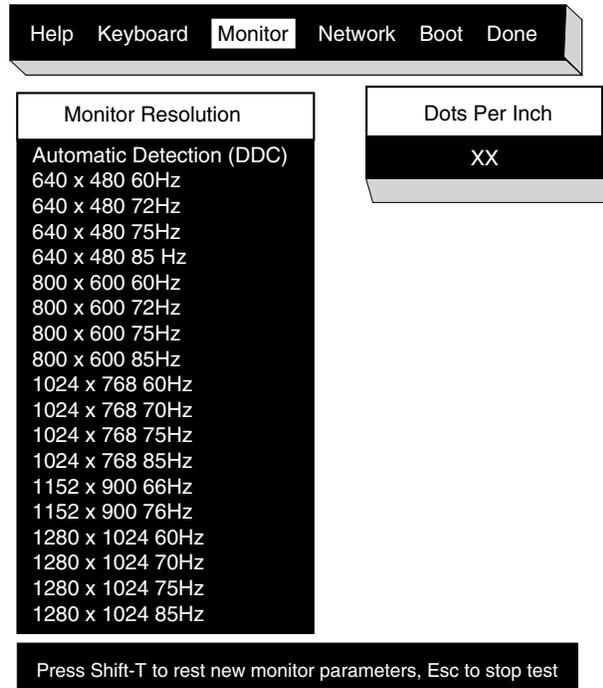
**Figure 4-1 Boot Monitor Main Menu**

- Use the right arrow key to select **Monitor**. The screen now displays the available monitor resolution settings. (See Figure 4-2 for the Explora 400 or Figure 4-3 on page 4-3 for the Explora 450.)



**Figure 4-2 Supported Resolutions for Explora 400**

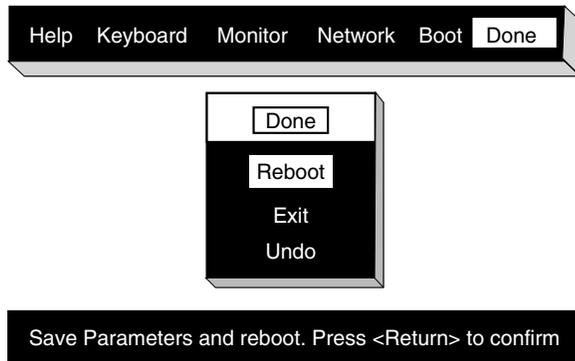
## 4-2 Selecting Screen Resolution



**Figure 4-3 Supported Resolutions for Explora 450**

5. Press the up or down arrow keys to select the correct setting for your monitor.
6. Press the right arrow key to select *Dots Per Inch*.
7. Enter the numerical value that matches the resolution you have selected or leave the default value.
8. To test the selected refresh rate, press Shift-T. Running this test generates a cross-hatch test pattern. If the refresh rate you select is not supported by the monitor, the test pattern will either not appear or not be stable.
9. Press any key to return to the Boot Monitor Main menu.

- 
10. Press the right arrow key to select Done. The menu shown in Figure 4-4 appears.

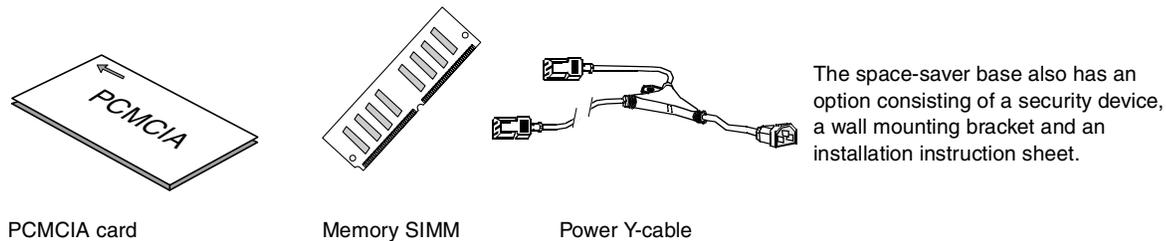


**Figure 4-4 Boot Monitor Done Menu**

11. Use the up or down arrow keys to select one of the options from the Done menu.
    - Reboot — saves the settings you changed and reboots the system.
    - Exit — saves the settings and returns you to the Boot Monitor.
    - Undo — reloads the parameters that were in effect when you entered the menus. The system continues to display the menus.
  12. Press the Return key.
- If you save your selection, you do not need to repeat this procedure unless you change to a different type or size of monitor.

## 5 Installing Optional Equipment in the Space-Saver Base

This section describes the installation of the Explora 400/450's optional equipment for the space-saver base. If you have the monitor support base, see "Installing Optional Equipment in the Monitor Support Base" on page 6-1. The optional equipment is shown in Figure 5-1.



PCMCIA card

Memory SIMM

Power Y-cable

**Figure 5-1 Optional Equipment**

If you are installing additional memory, do so before doing Section 3, "Basic Installation," on page 3-1.

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### Installing Additional Memory

You can add memory to your NC at any time. You may purchase it from NCD or other vendors. Only SIMMs supplied by NCD are covered under NCD's warranty. Contact NCD Technical Support for information about approved vendors.

In the standard configuration, Explora 400 has 8 MB of fast-page mode memory and the Explora 450 has 8 MB of EDO (extended data out) memory. Adding more memory does not improve NC speed.

## Installing Additional Memory

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Each application running on your NC and each open window requires memory. If the sum of all memory needed exceeds the installed memory, you get a message to close windows. To avoid this message, add memory to your NC.

Both the Explora 400 and Explora 450 have two SIMM slots. See Table 5-1 for the allowable configuration of the two slots and Table 5-2 on page 5-3 for a list of SIMM specifications.

The following rules apply:

- ❑ It makes no difference which slot is used as the first slot and which is used as the second.
- ❑ For the Explora 400 only, you can intermix fast-page mode and EDO SIMMs. You will always get fast-page mode performance.
- ❑ For the Explora 450 only, you *must* install EDO SIMMs.

**Table 5-1 Memory Configurations**

Total Memory (MB)	First Slot (MB)	Second Slot (MB)	Total Memory (MB)	First Slot (MB)	Second Slot (MB)
4	2	2	18	16	2
4	4	0	20	16	4
5	4	1	24	16	8
6	4	2	32	16	16
8	4	4	32	32	0
8	8	0	33	32	1
9	8	1	34	32	2
10	8	2	36	32	4
12	8	4	40	32	8
16	8	8	48	32	16
16	16	0	64	32	32
17	16	1			

### 5-2 Installing Optional Equipment in the Space-Saver Base

**Table 5-2 SIMM Specifications**

Speed	Fast-page mode (Explora 400) or EDO (Explora 450). 60 nanoseconds (ns) or faster. (Lower ns ratings are faster.) 72-pin.
Profile	Low profile (maximum 1.1 inches (28 mm) tall). Use tin-plated SIMM contacts.
Thickness	Board thickness of 0.047 inches to 0.054 inches (0.050 inches (1.27 mm) nominal). Installing SIMMs that are out of specifications might damage the SIMM slot or cause the NC to behave erratically.
Size	32-bits wide. 1 MB (256Kx32 SIMM) 2 MB (512Kx32 SIMM) 4 MB (1Mx32 SIMM) 8 MB (2Mx32 SIMM) 16 MB (4Mx32 SIMM) 32 MB (8Mx32 SIMM)



**If you do not feel confident performing the following procedure on your NC, send the NC to a qualified service center.**

Installing additional memory is a four-step procedure described in detail on the following pages:

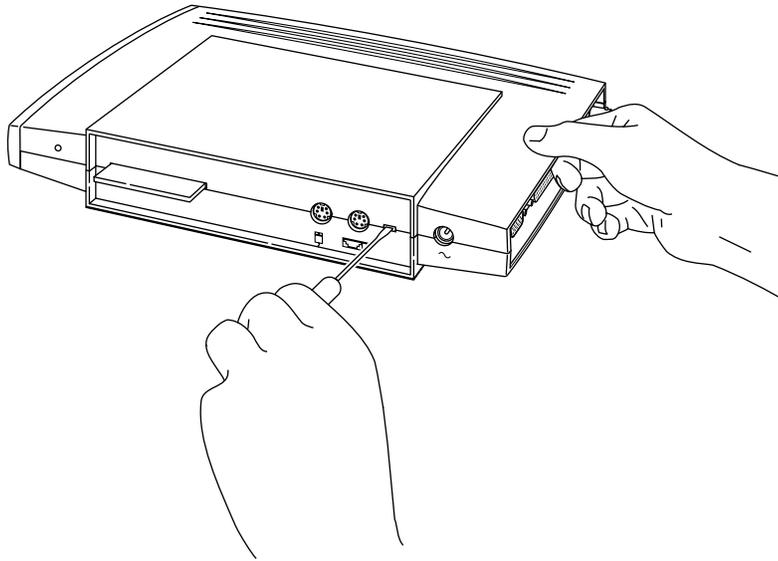
1. Disassemble the NC. See “Disassembling the Space-Saver Base” on page 5-4.
2. Install the SIMM(s). See “Installing SIMMs” on page 5-5.
3. Reassemble the NC. See “Reassembling the Space-Saver Base” on page 5-8.
4. Test the memory after your NC is up and running. See “Testing Memory” on page 5-10.

The only tool you need is a small flat-blade screwdriver.

### Disassembling the Space-Saver Base

To disassemble the space-saver base, follow these steps:

1. Remove all cables connected to the NC.
2. If you are using the stand, remove the NC from the stand.
3. Place the NC on a flat surface (preferably, on an anti-static mat) with the top facing up, as shown in Figure 5-2. As you face the NC, the three connectors are on your right.
4. Use a small flat-blade screwdriver to press on the tab located near the back of the NC on the connector-side. At the same time, gently pull the NC's top section up.



**Figure 5-2 Pressing the Tabs**

5. Repeat step 4 for the tab on the opposite side of the base.

### 5-4 Installing Optional Equipment in the Space-Saver Base

- Lift the top section at the front up so that you can separate the top's hooks from the bottom section's slots. Remove the top. See Figure 5-3.

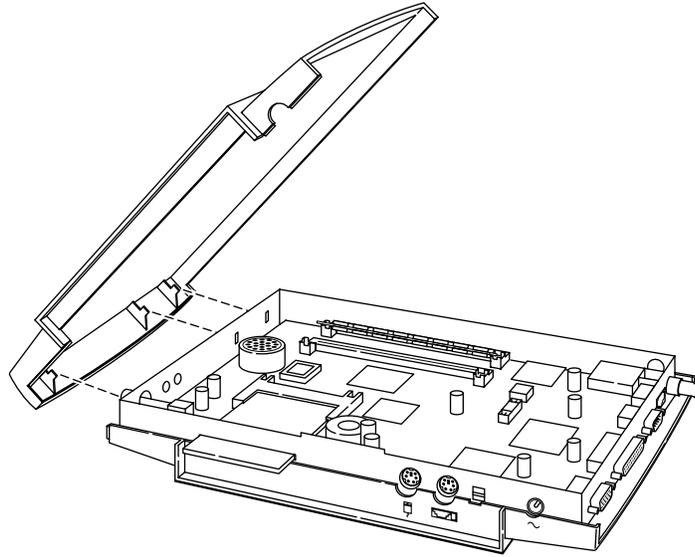


Figure 5-3 Separating the Top from the Bottom

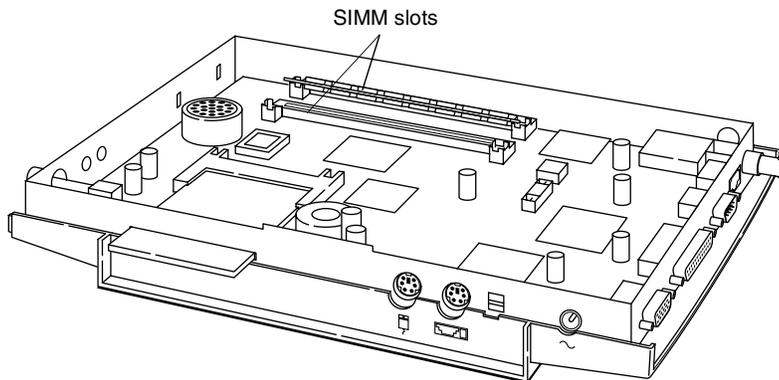
## Installing SIMMs



Electrostatic Discharge (ESD) can damage SIMMs and other components located on the logic board. Make sure you touch a suitable ground before handling any SIMM. If possible, set the NC on an anti-static mat and wear a grounding strap.

Always handle SIMMs *only* by the edges.

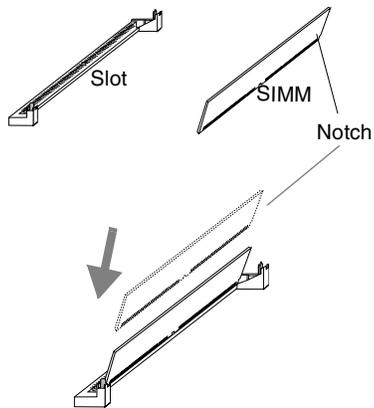
Your NC already has a SIMM or SIMMs installed. The SIMM slots, located on the left side of the logic board, are labeled J9 and J10. (See Figure 5-4.) Observe the SIMM(s) currently in the slots and refer to Table 5-1, "Memory Configurations," on page 5-2 to determine your configuration. Decide what you want your new configuration to be. If you need to remove an existing SIMM, go to "Removing SIMMs" on page 5-7 and then return to this section for installation instructions.



**Figure 5-4 Location of the SIMM Slots**

To install the SIMM(s):

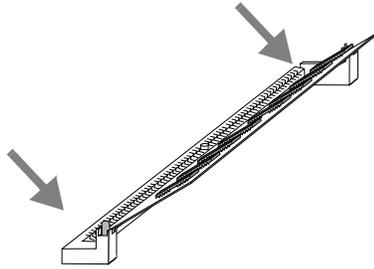
1. Orient the SIMM so that the notch is facing towards the back of the logic board. (See Figure 5-5.)



**Figure 5-5 Orienting the SIMM**

### 5-6 Installing Optional Equipment in the Space-Saver Base

2. Insert the SIMM into the slot at about a 45-degree angle. (See Figure 5-6.)



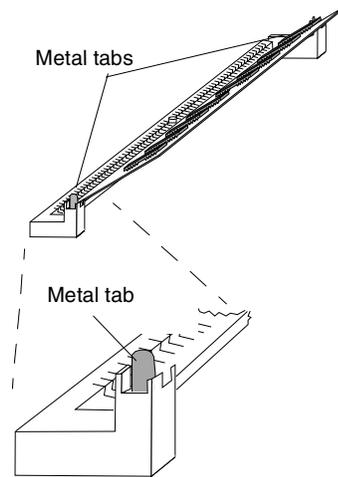
**Figure 5-6 Inserting the SIMM**

3. When you are certain the SIMM is inserted all the way, press down on both ends of the SIMM until it clicks into place. The SIMM should go past the metal tabs on each end of the slot. The SIMM should lie at about a 25- to 30-degree angle in the slot.

## Removing SIMMs

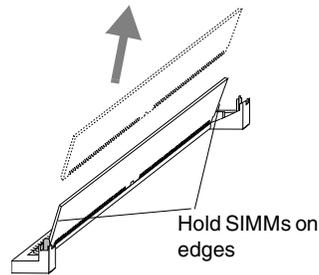
To remove a SIMM:

1. Use your two forefingers or your thumbs to pull back on the two metal tabs located on each end of the SIMM slot. (See Figure 5-7.)



**Figure 5-7 Metal Tab Locations**

2. As you pull back on the tabs, the SIMM pops up past the metal tabs. (See Figure 5-8.)



**Figure 5-8 Removing the SIMM**

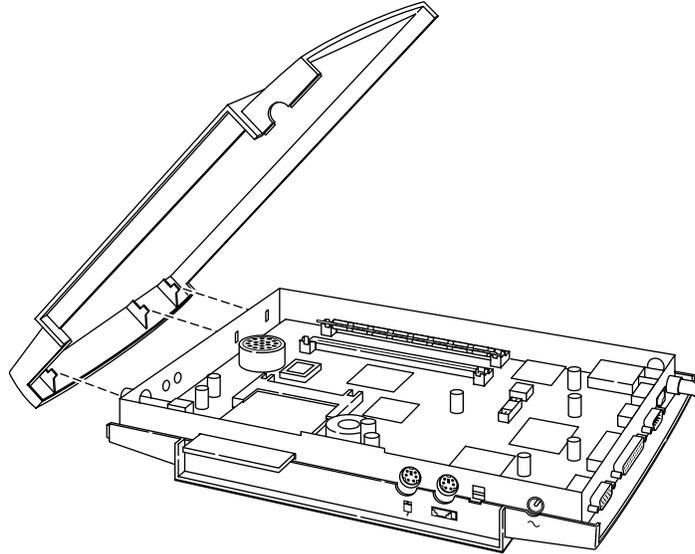
3. Hold the SIMM on both ends and remove it from the slot.

## Reassembling the Space-Saver Base

To reassemble the NC, follow these steps:

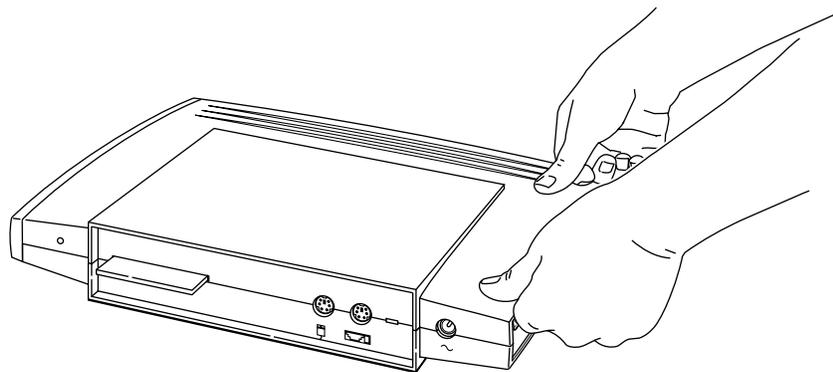
1. Swing the front of the top section over the front edge of the bottom section and continue down, placing the hooks on the top section in the slots on the bottom, as shown in Figure 5-3 on page 5-5.

**Note** Make sure the top section is resting completely aligned on the bottom section before going to step 2.



**Figure 5-9 Placing the Top on the Bottom**

2. Gently press the top section down until the two tabs click through the two openings on the bottom section. (See Figure 5-10.)



**Figure 5-10 Joining the Top Cover to the Bottom Section**

3. Install the cabling. See Section 3, "Basic Installation," on page 3-1.
4. After the system is installed, perform the memory test. See "Testing Memory."

### Testing Memory

The NC must be installed before you can run the memory test. After installation, you can access the Boot Monitor to run the memory test.

#### Accessing the Boot Monitor

1. Turn on the system or reboot (if the system is already on).
2. After the Boot Monitor title and version number, messages similar to the following appear. Press the Escape key to interrupt the booting process.

```
Searching for IP address...
Using IP address IP address of terminal
Searching for subnet mask
Using subnet mask subnet mask
.....(Press Escape to interrupt booting.)
>
```

#### Memory Test

Run the memory test as follows:

1. Type a question mark and press the Return key to find the command for Extended Tests.
2. Type the Extended Tests command and press the Return key.
3. Type the number associated with the Test Available Memory test and press the Return key.

```
Enter test number ? Test-number <CR>
```

4. Press the Return key to run the test once.

```
F Loop forever
E Loop until error
Q Main menu
<cr> Test once
Esc Abort testing
Enter choice? <CR>
```

If memory is good, a diagnostic code such as the following displays:

```
Pass -00000001
```

If an error is detected, a message such as the following displays:

```
Expected bad component is JXX.
```

JXX indicates the slot number of a bad SIMM. If there are no errors, go to step 7. If errors are reported, continue with step 5.

5. Remove the bad SIMM from the slot indicated and rerun the memory test to confirm that the remaining memory is good.
6. Add a new SIMM and rerun the memory test to confirm that the newly installed SIMM is good.
7. Exit from the test and return to the Boot Monitor by typing:  

```
Enter test type? Q <CR>
```
8. Reset the computer by typing:  

```
rs <CR>
```

For information about the Boot Monitor commands, refer to NCDware software documentation.

---

## Installing PCMCIA Cards

The PCMCIA cards are 68-pin credit card-size devices that fit into the NC's PCMCIA slot. You can order these cards directly from NCD or from other vendors.



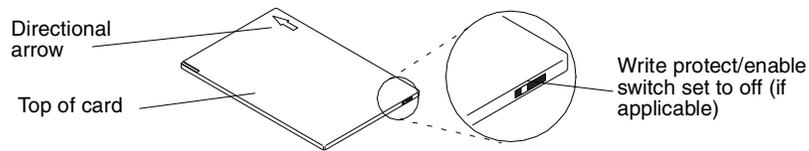
**Do not insert or remove the PCMCIA card while the NC is running. Always turn NC power off first.**

**Do not use a 12-volt PCMCIA card on Explora 400/450 NCs. Only 5-volt PCMCIA cards are supported.**

Most PCMCIA cards have an arrow on the top face side showing which direction you should insert them into the PCMCIA slot. The cards are keyed, so you cannot install them upside down.

The rear edge of the PCMCIA card might have a write protect/enable switch. If your card has this switch, it should be in the OFF position. If write protect is enabled, data cannot be written to the card and an error message appears if you try to do so.

Figure 5-11 shows the directional arrow and write protect/enable switch.



**Figure 5-11 PCMCIA Card Features**

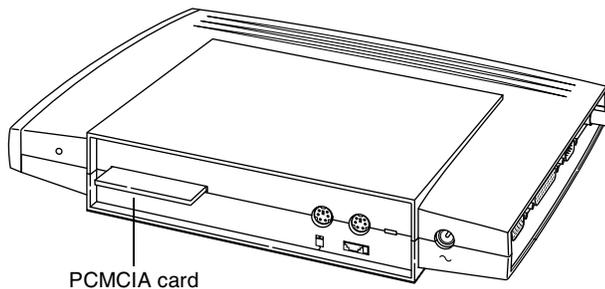
To install a PCMCIA card:

1. Shut off the NC.
2. If your PCMCIA card has a write protect switch, set it to OFF.
3. See Figure 5-12. With the NC's PCMCIA slot on your left and the PCMCIA card's arrow side facing up, slide the card into the PCMCIA slot until you feel the card make contact with the pins in the socket.



**Do not force the card into the socket. The card should go straight in.**

4. Firmly push the card into the socket to seat it.



**Figure 5-12 Inserted PCMCIA Card**

## Installing the Power Y-Cable

Use the optional power Y-cable in place of the monitor's line cord when you have a power transformer that requires its own line cord. Install the Y-cable, power transformer, and line cord as shown in Figure 5-13.

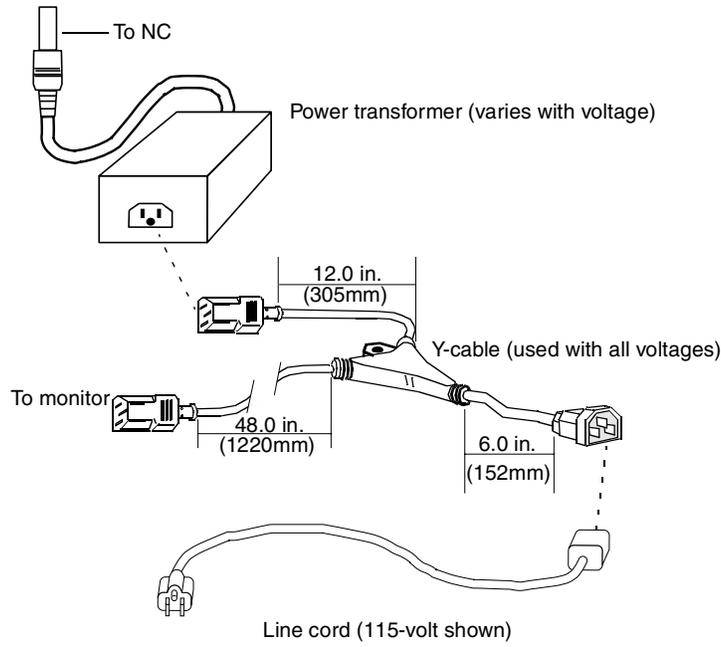


Figure 5-13 Transformer, Y-Cable and Line Cord

## Installing the Security Device and Mounting Bracket

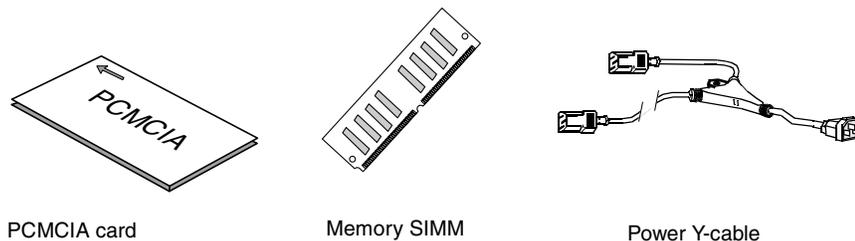
The security device and mounting bracket option includes all screws and an installation instruction sheet. Refer to that instruction sheet to install them.



## 6 Installing Optional Equipment in the Monitor Support Base

This section describes the installation of the Explora 400/450 optional equipment for the monitor support base. If you have the space-saver base, see “Installing Optional Equipment in the Space-Saver Base” on page 5-1. The following optional equipment, shown in Figure 6-1, is available for the monitor support base.

If you are adding additional memory, do so before doing Section 3, “Basic Installation,” on page 3-1.



**Figure 6-1** Optional Equipment

---

### Installing Additional Memory

You can add memory to your unit at any time. You may purchase it from NCD or other vendors. Only SIMMs supplied by NCD are covered under NCD’s warranty. Contact NCD Technical Support for information about approved vendors.

In the standard configuration, Explora 400 has 8 MB of fast-page mode memory and the Explora 450 has 8 MB of EDO memory. Adding more memory does not improve NC speed.

## Installing Additional Memory

---

Each application running on your NC and each open window requires memory. If the sum of all memory needed exceeds the installed memory, you get a message to close windows. To avoid this message, add memory to your NC.

Both the Explora 400 and Explora 450 have two SIMM slots. See Table 6-1 for the allowable configuration of the two slots and Table 6-2 on page 6-3 for a list of SIMM specifications.

The following rules apply:

- ❑ It makes no difference which slot is used as first slot and which is used as the second.
- ❑ For the Explora 400 only, you can intermix fast-page mode and EDO SIMMs. You will always get fast-page mode performance.
- ❑ For the Explora 450 only, you *must* install EDO SIMMs.

**Table 6-1 Memory Configurations**

Total Memory (MB)	First Slot (MB)	Second Slot (MB)	Total Memory (MB)	First Slot (MB)	Second Slot (MB)
4	2	2	18	16	2
4	4	0	20	16	4
5	4	1	24	16	8
6	4	2	32	16	16
8	4	4	32	32	0
8	8	0	33	32	1
9	8	1	34	32	2
10	8	2	36	32	4
12	8	4	40	32	8
16	8	8	48	32	16
16	16	0	64	32	32
17	16	1			

## 6-2 Installing Optional Equipment in the Monitor Support Base

**Table 6-2 SIMM Specifications**

Speed	Fast-page mode (Explora 400) or EDO (Explora 450). 60 nanoseconds (ns) or faster. (Lower ns ratings are faster.) 72-pin.
Profile	Low profile (maximum 1.1 inches (28 mm) tall). Use tin-plated SIMM contacts.
Thickness	Board thickness of 0.047 inches to 0.054 inches (0.050 inches (1.27 mm) nominal). Installing SIMMs that are out of specifications might damage the SIMM slot or cause the NC to behave erratically.
Size	32-bits wide. 1 MB (256Kx32 SIMM) 2 MB (512Kx32 SIMM) 4 MB (1Mx32 SIMM) 8 MB (2Mx32 SIMM) 16 MB (4Mx32 SIMM) 32 MB (8Mx32 SIMM)



**If you do not feel confident performing the following procedure on your NC, send the NC to a qualified service center.**

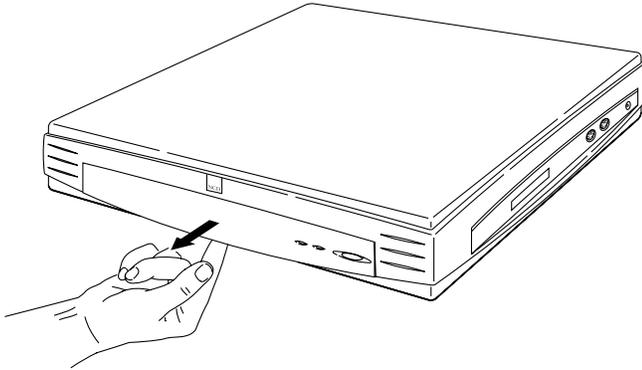
Installing additional memory is a four-step procedure described in detail on the following pages:

1. Disassemble the NC. See “Disassembling the Monitor Support Base” on page 6-4.
2. Install the SIMM(s). See “Installing SIMMs” on page 6-6.
3. Reassemble the NC. See “Reassembling the Monitor Support Base” on page 6-10.
4. Test the memory after your NC is up and running. See “Testing Memory” on page 6-11.

The only tool you need is a small flat-blade screwdriver.

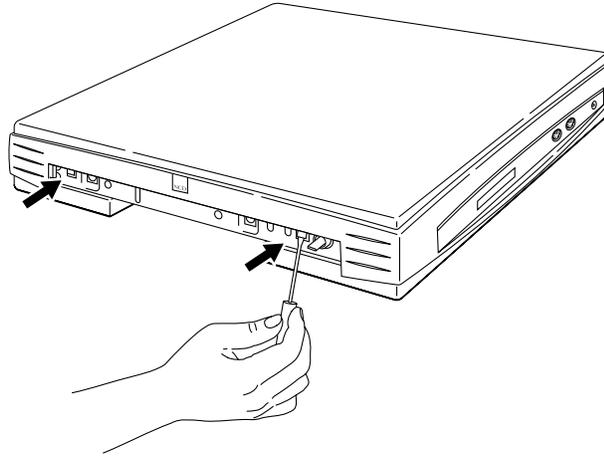
### Disassembling the Monitor Support Base

1. Remove all cables connected to the base. If a PCMCIA card is installed, remove it.
2. Place the base with the top up and the front facing you (preferably, on an anti-static mat).
3. Use your finger to release the clip on the front control panel and remove the panel. See Figure 6-2.



**Figure 6-2 Removing the Front Control Panel**

4. Use a small flat-blade screwdriver to release the two tabs located on the front of the NC, as shown in Figure 6-3.

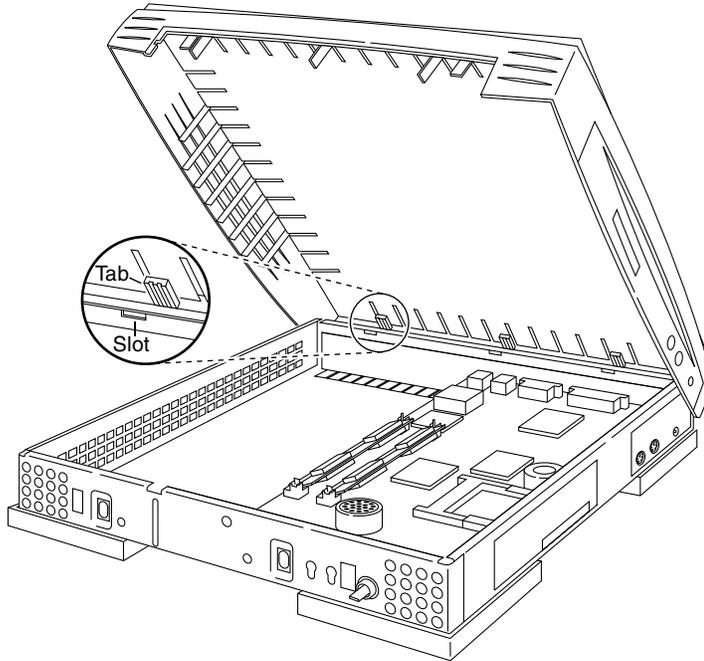


**Figure 6-3 Releasing the Tabs**

5. Lift the top section up at the front so you can slide the top's tabs from the bottom section's slots to separate the cover from the bottom. See Figure 6-4.



**Lift the top section up at the front *only until* you can slide the top's tabs from the bottom section's slots. If you lift the top section too high, the tabs can break.**



**Figure 6-4 Removing the Top Cover**

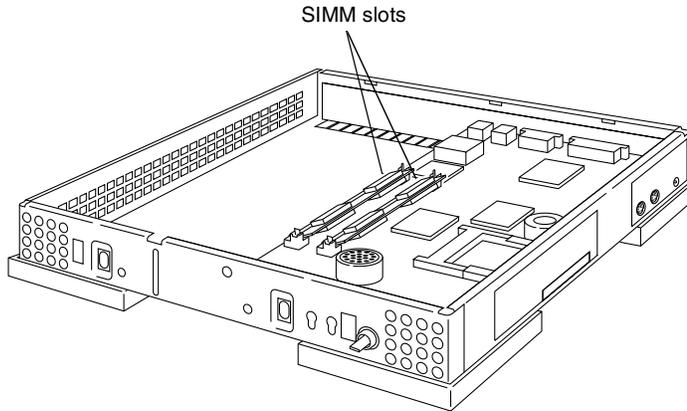
## Installing SIMMs



Electrostatic Discharge (ESD) can damage SIMMs and other components located on the logic board. Make sure you touch a suitable ground before handling any SIMM. If possible, set the NC on an anti-static mat and wear a grounding strap.

Always handle SIMMs *only* by the edges.

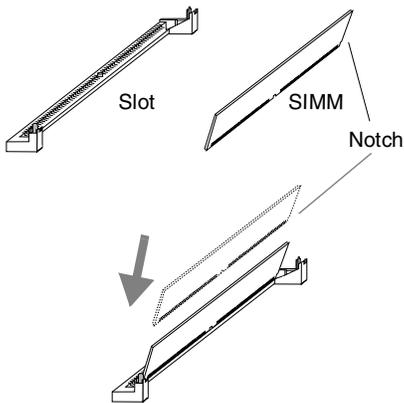
Your NC already has a SIMM or SIMMs installed. The SIMM slots, located on the left side of the logic board, are labeled J9 and J10. (See Figure 6-5.) Observe the SIMM(s) currently in the slots and refer to Table 6-1, "Memory Configurations," on page 6-2 to determine your configuration. Decide what you want your new configuration to be. If you need to remove an existing SIMM, go to "Removing SIMMs" on page 6-9 and then return to this section for installation instructions.



**Figure 6-5 Location of the SIMM Slots**

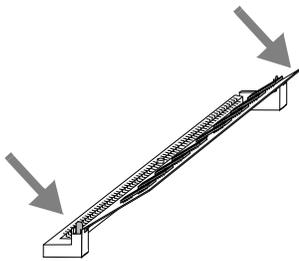
To install the SIMM(s):

1. Orient the SIMM so that the notch is facing towards the back of the logic board. (See Figure 6-6.)



**Figure 6-6 Orienting the SIMM**

2. Insert the SIMM into the slot at about a 45-degree angle. (See Figure 6-7.)



**Figure 6-7 Inserting the SIMM**

3. When you are certain the SIMM is inserted all the way, press down on both ends of the SIMM until it clicks into place. The SIMM should go past the metal tabs on each end of the slot.

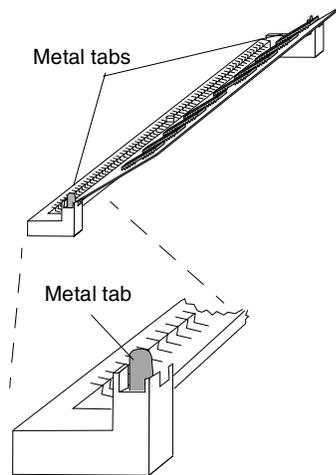
The SIMM should lie at about a 25- to 30-degree angle in the slot.

## 6-8 Installing Optional Equipment in the Monitor Support Base

## Removing SIMMs

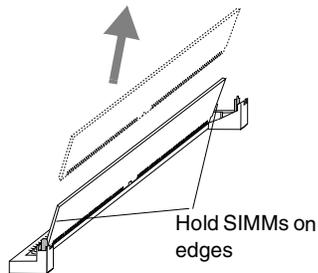
To remove a SIMM:

1. Use your two forefingers or your thumbs to pull back on the two metal tabs located on each end of the SIMM slot. (See Figure 6-8.)



**Figure 6-8 Metal Tab Locations**

2. As you pull back on the tabs, the SIMM pops up past the metal tabs. (See Figure 6-9.)



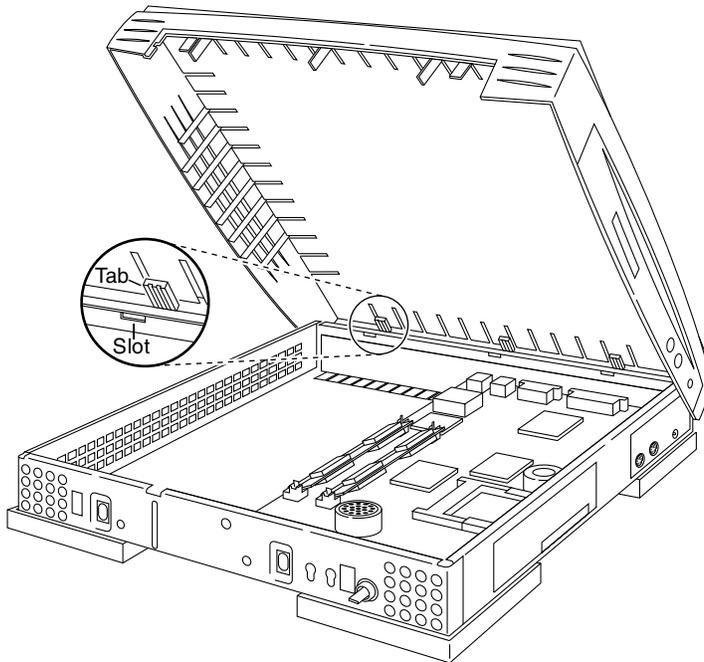
**Figure 6-9 Removing the SIMM**

3. Hold the SIMM on both ends and remove it from the slot.

### Reassembling the Monitor Support Base

To reassemble the base, follow these steps:

1. Swing the back of the top section over the back edge of the bottom section and align the tabs on the top section with the slots on the bottom section, as shown in Figure 6-10.



**Figure 6-10 Placing the Top Cover on the Bottom Section**

2. Lower the front of the top section until the three tabs slide through the three slots on the bottom section.
3. Replace the front control panel.
4. Replace the PCMCIA card if appropriate. See "Installing PCMCIA Cards" on page 6-12.
5. Install the cabling. See Section 3, "Basic Installation," on page 3-1.
6. After the system is installed, perform the memory test. See "Testing Memory" on page 6-11.

## Testing Memory

The NC must be installed before you can run the memory test. After installation, you can access the Boot Monitor to run the memory test.

### Accessing the Boot Monitor

1. Turn on the system or reboot (if the system is already on).
2. After the Boot Monitor title and version number, messages similar to the following appear. Press the Escape key to interrupt the booting process.

```
Searching for IP address...
Using IP address IP address of terminal
Searching for subnet mask
Using subnet mask subnet mask
.....(Press Escape to interrupt booting.)
>
```

### Memory Test

Run the memory test as follows:

1. Type a question mark and press the Return key to find the command for Extended Tests.
2. Type the Extended Tests command and press the Return key.
3. Type the number associated with the Test Available Memory test and press the Return key.

```
Enter test number ? Test-number <CR>
```

4. Press the Return key to run the test once.

```
F Loop forever
E Loop until error
Q Main menu
<cr> Test once
Esc Abort testing
Enter choice? <CR>
```

If memory is good, a diagnostic code such as the following displays:

```
Pass -00000001
```

## Installing PCMCIA Cards

---

If an error is detected, a message such as the following displays:

```
Expected bad component is JXX.
```

JXX indicates the slot number of a bad SIMM. If there are no errors, go to Step 7. If errors are reported, continue with Step 5.

5. Remove the bad SIMM from the slot indicated and rerun the memory test to confirm that the remaining memory is good.
6. Add a new SIMM and rerun the memory test to confirm that the newly installed SIMM is good.
7. Exit from the test and return to the Boot Monitor by typing:  
Enter test type? **Q <CR>**
8. Reset the computer by typing:  
**rs <CR>**

For information about the Boot Monitor commands, refer to NCDware software documentation.

---

## Installing PCMCIA Cards

The PCMCIA cards are 68-pin credit card-size devices that fit into the base PCMCIA slot. You can order these cards directly from NCD or from other vendors.



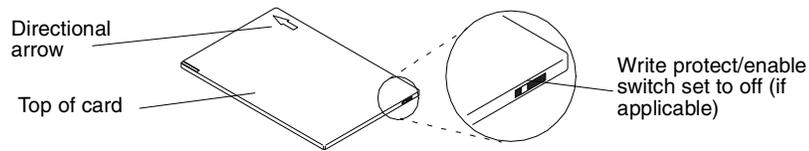
**Do not insert or remove the PCMCIA card while the unit is running. Always turn off the computer first.**

**Do not use a 12-volt PCMCIA card on Explora 400/450 NCs. Only 5-volt PCMCIA cards are supported.**

Most PCMCIA cards have an arrow on the top face side showing which direction you should insert them into the PCMCIA slot. The cards are keyed, so you cannot install them upside down.

The rear edge of the PCMCIA card might have a write protect/enable switch. If your card has this switch, it should be in the OFF position. If write protect is enabled, data cannot be written to the card and an error message appears if you try to do so.

Figure 6-11 shows the directional arrow and write protect/enable switch.



**Figure 6-11 PCMCIA Card Features**

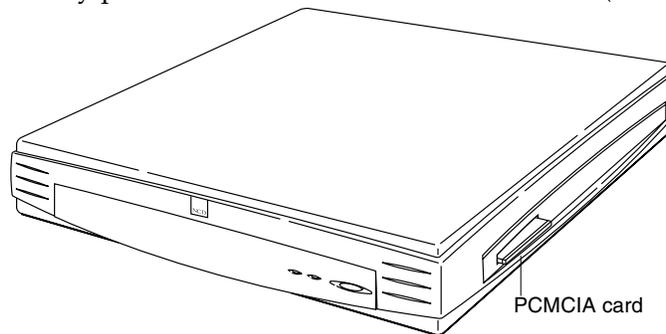
To install a PCMCIA card:

1. Shut off the NC.
2. If your PCMCIA card has a write protect switch, set it to OFF.
3. With the arrow side facing up, slide the card into the PCMCIA slot until you feel the card make contact with the pins in the socket.



**Do not force the card into the socket. The card should go straight in.**

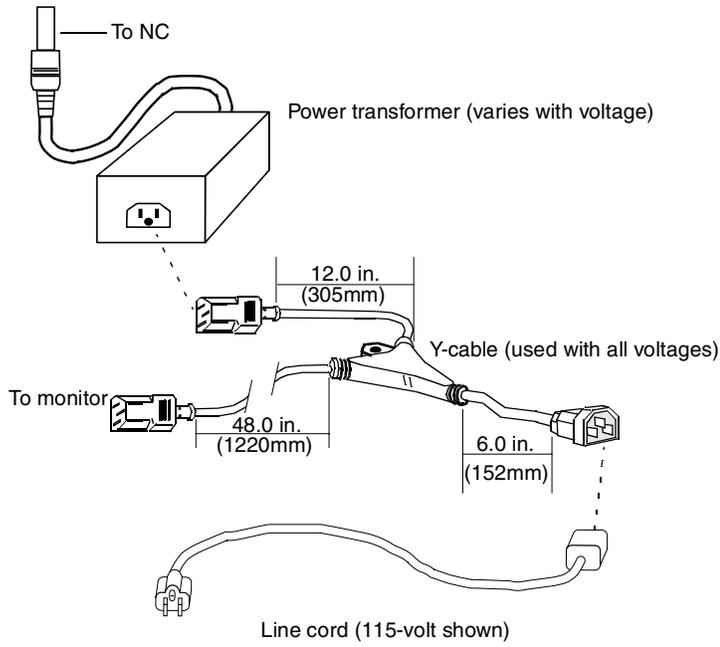
4. Firmly push the card into the socket to seat it. (See Figure 6-12.)



**Figure 6-12 Inserted PCMCIA Card**

## Installing the Power Y-Cable

Use the optional power Y-cable in place of the monitor's line cord when you have a power transformer that requires its own line cord. Install the Y-cable, power transformer, and line cord as shown in Figure 6-13.



**Figure 6-13 Transformer, Y-Cable and Line Cord**

# 7 Specifications

Table 7-1 contains Explora 400/450 specifications.

**Table 7-1 Explora 400/450 Specifications**

Category	Topic	Specification
Hardware architecture	Microprocessor	
	Explora 400	PPC 403GA, 33 MHz
	Explora 450	PPC 403GCX, 66 MHz
	Video Coprocessor	S3 TRIO64V2/DX (both models)
	DRAM	
	Explora 400	8 MB fast-page mode
	Explora 450	8 MB EDO
	PROM	512KB flash (both models)
	Memory upgrades	
	Explora 400	2 SIMM slots 32-bit, 60ns, fast-page mode SIMMs
	Explora 450	2 SIMM slots 32-bit, 60ns, EDO SIMMs
	NVRAM	512 Bytes (both models)
Display memory		
Explora 400	1 MB	
Explora 450	2 MB	
Display monitor	Resolution	
	Explora 400	640x480, 800x600, 1024x768, 1152x900
	Explora 450	640x480, 800x600, 1024x768, 1152x900, 1280x1024
	Refresh rate	Up to 85 Hz

**Table 7-1 Explora 400/450 Specifications (Continued)**

<b>Category</b>	<b>Topic</b>	<b>Specification</b>
Power transformer	AC voltage and AC frequency North America European/ Australian Japanese	90-132 VAC, 60 Hz ( $\pm 3$ Hz) 180-265 VAC, 50 Hz ( $\pm 3$ Hz) 85-110 VAC, 50 Hz ( $\pm 3$ Hz)
Power consumption		19 Watts (maximum)
Environmental operating range	Temperature Humidity Altitude	10° C (50° F) to 40° C (104° F) 10% to 90% non-condensing Up to 3,050 meters (10,000 feet)
Controls and indicators	NC  Keyboard	Power switch, Power LED, Network Activity, and Twisted-Pair Link Indicator.  N-97K: Three configurable LEDs (Unlabeled, Caps Lock, and Network Activity)  N-101M/N-101MPS/N-102/ Windows 95-compatible keyboards: Three configurable LEDs (Num Lock, Caps Lock and Scroll Lock)  N-108LK: Four configurable LEDs (Hold Screen, Lock, Compose, and Network Activity)  N-123 Sun Type 5-compatible: Four configurable LEDs (Caps Lock, Compose, Scroll Lock, and Number Lock)

**Table 7-1 Explora 400/450 Specifications (Continued)**

<b>Category</b>	<b>Topic</b>	<b>Specification</b>
Input devices	Keyboards	97-key UNIX style keyboard (N-97)  97-key Kana keyboard (Japanese characters) (N-97K)  101-key PS/2 style keyboards (N-101M, N-101MPS)  Windows 95-compatible keyboards  102-key international version (N-102)  108-key LK401-compatible keyboard (N-108LK)  N123 Sun Type 5-compatible keyboard (N-123)
	Mouse	Three-button, PS/2
Communications	Ethernet	
	Explora 400	Built-in 10BaseT twisted-pair transceiver
	Explora 450	(All) Built-in 10/100BaseTX twisted-pair transceiver (Option in place of audio output) Thin coax Ethernet
	Serial port	RS-232 C up to 115.2 K baud
	Parallel port	Connector: 25-pin Data: bidirectional 8-bit parallel Logic level: TTL level
	PCMCIA	Standard PCMCIA PC card Standard Release 2.01, 68-pin connector
	Audio	Standard 1/8-inch stereo mini-jack

**Table 7-1 Explora 400/450 Specifications (Continued)**

<b>Category</b>	<b>Topic</b>	<b>Specification</b>
Physical Dimensions	Space-saver base	
	Height	1.9 inches (4.8 cm)
	Width	7.6 inches (19.3 cm)
	Depth	11.3 inches (28.7 cm)
	Weight	2.6 pounds (1.2 kg)
	Space-saver base in stand	
	Height	9.6 inches (24.4 cm)
	Width	5.5 inches (13.9 cm)
	Depth	11.3 inches (28.7 cm)
	Weight	2.8 pounds (1.3 kg)
	Monitor support base	
	Height	2.1 inches (5.3 cm)
	Width	12.8 inches (32.5 cm)
Depth	13.2 inches (33.5 cm)	
Weight	5.5 pounds (2.5 kg)	

## 8 Troubleshooting

NCD network computers have four major components:

- Base
- Monitor
- Keyboard
- Mouse

If found to be faulty, the base or monitor must be returned for repair. The mouse, or keyboard are replaceable.

---

### Isolating Faulty Components

One of the best ways of tracking down hardware problems is to swap components among compatible NCs. Swapping components lets you determine which component is faulty.

For example, if a keyboard appears to be faulty, turn off the NC, disconnect the keyboard, and connect a keyboard from another NCD NC. If the second keyboard works, you know that the problem is with the first keyboard and not with another component, such as the base.

---

### Mouse Troubleshooting

Most mouse problems are caused by a dirty ball or a loose connection between the mouse cable and the base. If you have problems using your mouse:

1. Check the mouse cable connector. Make sure it is firmly connected to the base's mouse connector.
2. Remove the ball from the mouse. Clean the ball and its socket, and reassemble the mouse.
3. Clean your mouse pad or the area of the desk where your mouse sits.

### Monitor Troubleshooting

Generally, if the monitor is out of focus, too bright, or too dark, adjust the monitor's brightness and contrast knobs. Each monitor model has its own set of controls. Check the monitor operating booklet for more information about your monitor.

---

### Base Troubleshooting

A flashing power indicator indicates there is a hardware problem in the base.

If you find you must return a base for repair, send it in the same configuration as when it failed.

---

### In Case of Trouble

If you encounter difficulties, either contact your local NCD representative or:

- Phone NCD Technical Support at (650) 691-7445
- Send a FAX to NCD Technical Support at (650) 903-7426
- Send e-mail to NCD Technical Support at [support@ncd.com](mailto:support@ncd.com)
- See NCD's home page at <http://www.ncd.com>

Regardless of the method you use to report the problem to NCD, you must have the following information ready:

- Your name and title
- Company or organization
- Phone number
- E-mail address
- Billing address
- Shipping address

- ❑ For each hardware item:
  - Serial number
  - Description of the problem
  - Type of warranty (Standard, Express, Extended, Express Exchange, Out-of-Warranty)

## Returning Components

If you have to return a component, follow these steps.

1. Gather the information listed in “In Case of Trouble” on page 8-2 and contact NCD Technical Support to obtain a Return Material Authorization (RMA) number.
2. Once you have obtained an RMA number, package the component for return.

If you would rather not pack the component yourself, NCD recommends that you take it to a commercial packing and shipping company.

3. Mark each return package with the assigned RMA number and address each package as shown below to avoid problems or delays:

Customer Service  
Network Computing Devices  
350 North Bernardo Avenue  
Mountain View, CA 94043  
RMA number

**Note** Equipment returned without an RMA number is subject to delays or might be returned to the sender.

## Ethernet Address of Replacement Bases

If a base is replaced, its Ethernet address is different on the replacement base. You must change system files that contain Ethernet addresses.

## Comments on the Booklet

You can send comments, suggestions, or questions about this booklet to the NCD Technical Publications Department by Internet e-mail. Write to **techpubs@ncd.com**.

