HEWLETT-PACKARD

Setting Up and Using Your HP Vectra QS

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HP Vectra QS/16S and QS/20

Setting Up and Using Your HP Vectra QS

HEWLETT PACKARD

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FCC Statement

Federal Communications Commission (FCC) Radio Frequency Interference Statement (USA only).

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

More About Radio and Television Interference

Because your computer generates and uses radio frequency energy, it may cause interference with radio and television reception in a residential installation.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your system.

Caution: Cables used with this computer must be properly shielded to comply with the requirements of the FCC.

The computer meets the requirements for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference with radio and television reception in a residential installation.

Hewlett-Packard provides instructions for using this computer in manuals covering setup, connection of peripheral devices, operation, service, and technical reference.

Installing and using the computer in strict accordance with Hewlett-Packard's instructions will minimize the chances that your computer will cause radio or television interference. However, Hewlett-Packard does not guarantee that the computer will not interfere with radio and television reception.

If you think your computer is causing interference, turn it off to see if the radio or TV reception improves. If the reception improves, your computer is causing the problem.

To correct interference, take one or more of the following interference remedies, as needed:

- Relocate the radio or TV antenna.
- Move the computer away from the radio or television.
- Plug the computer into a different electrical outlet, so that the computer and the radio or television are on separate electrical circuits.
- Make sure that all of your peripheral devices are certified Class B by the FCC.
- Make sure you use only shielded cables to connect peripheral devices to your computer.
- Consult your computer dealer, Hewlett-Packard, or an experienced radio/television technician for other suggestions.

Warning: UK BS6301

1. Interconnection directly, or by way of any other apparatus, of ports marked "WARNING CONNECT ONLY APPARATUS COMPLYING WITH BS6301 TO THIS PORT" with ports not so marked may produce hazardous conditions on the network and advice should be obtained from a competent engineer before such a connection is made.
2. Connect only apparatus complying with BS6301 to the video port.
3. Connection to the network must be disconnected before the equipment power plug is removed.
4. Connection to the network must not be hard-wired.

Statement for Japan

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しかし，本装置をラジオ，テレビジョン受信機に近接してご使用になると，受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Electrical Safety

Warning

For your safety, the power cords supplied with this product have grounded plugs. The power cords should be used with properly grounded (3-hole) wall outlets to avoid electrical shock. (You can also use multiple-outlet strips that have their own circuit breakers.)

Batteries

Warning

This computer uses lithium batteries, which may explode if mistreated. DO NOT recharge or disassemble them, or dispose of them in fire. When the batteries need replacement (every 3 to 5 years), use only lithium batteries, HP Part No. 45935-60008, available from your Hewlett-Packard dealer. Use of any other batteries may present a risk of fire or explosion. (Refer to Chapter 14 "Changing the Battery Pack" for instructions on replacing the batteries.)

Handle Electronic Components Safely

- **Handle components gently.** Do not drop or handle roughly.
- **Protect from static electricity.** Electrical components are easily damaged by small amounts of static electricity. Whenever you handle components:
  - Leave the component in its anti-static bag until you are ready to install it.
  - If possible, use an anti-static wrist strap and a grounding mat such as those included in the Electrically Conductive Field Service Grounding Kit (HP part number 9300-1155).
  - Before you remove the component from the anti-static bag, simultaneously touch the surfaces of the bag and a metal surface on your computer.
- **Hold by the edges only.** When you remove the component from the anti-static bag, handle it only by its edges. DO NOT TOUCH the components's metal pins.
- **Handle components as little as possible.**

HP PC Forum on CompuServe

The HP PC Forum is an easy way to obtain up-to-date information and answers to your questions about HP personal computers. The HP PC Forum is an online bulletin board messaging system maintained jointly by Hewlett-Packard and HP PC users. HP system operators answer questions and maintain libraries which contain contributed articles and software. Conferences are scheduled periodically for online discussions of selected topics.

The HP PC Forum is available through the CompuServe Information Service, the largest electronic information service in the world. To access the HP PC Forum, you must have an account with CompuServe and a PC with a 300, 1200, or 2400 baud modem. As a preferred Hewlett-Packard customer, you are invited to join the Hewlett-Packard forum on CompuServe at no charge. Simply call 1-800-848-8990 (614-457-0802 if outside U.S. and Canada) and ask for Representative #133. CompuServe will send you a free introductory membership immediately.

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INTEREX, the International Association of Hewlett-Packard Computer Users, is an independent global professional association offering a comprehensive range of services and activities, including publications, conferences, a library of current programs, and up-to-date information about the HP computing world. For more information, direct questions to the Member Services Department of INTEREX, 585 Maude Ct., Sunnyvale, CA 94088-3439. USA phone: (408) 738-4848, Telex: 4971527, FAX: (408) 736-2156.

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Contents

1

Setup Steps

This chapter describes the steps necessary for setting up your computer. Perform these steps in the order in which they are listed. Skip steps that do not pertain to you.

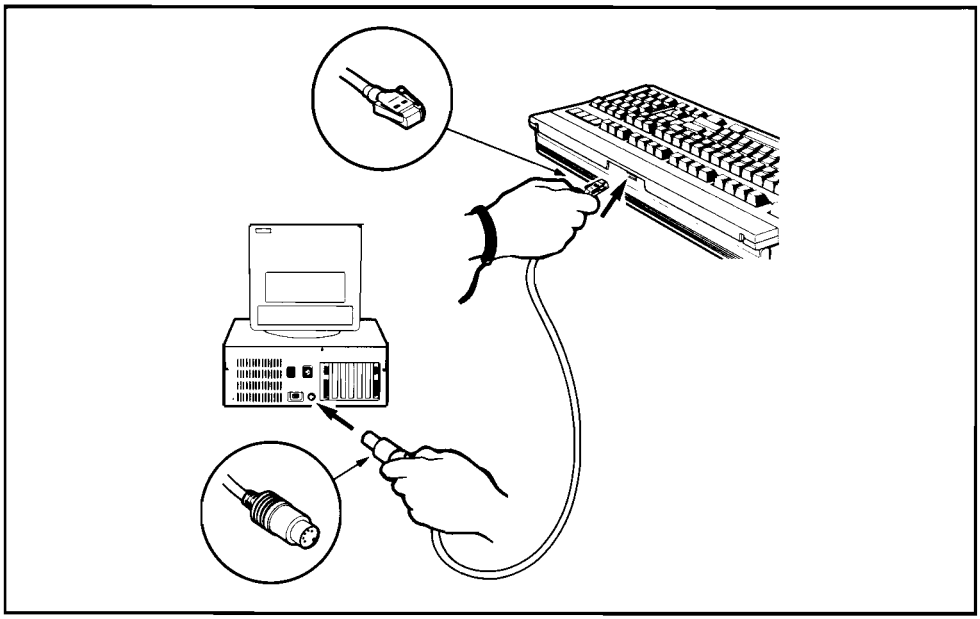
1. **Install any options and accessories.**

   You will find detailed installation instructions in the chapters mentioned.

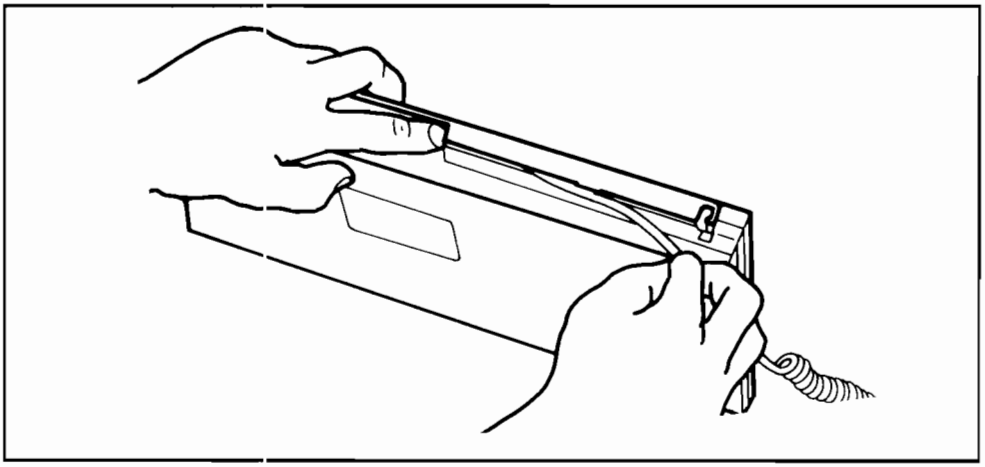
   - Remove the cover (see Chapter 2)
   - Remove the Processor/Memory Card (see Chapter 3) before installing:
     - Memory modules (see Chapter 4)
     - The coprocessor (see Chapter 4)
     - The security lock (see Chapter 5)
   - Replace the Processor/Memory Card (see Chapter 3)
   - Install video, memory, and accessory cards (see Chapter 6)
   - Install disk and tape drives (see Chapter 7)
   - Replace the cover (see Chapter 2)

   Record the type of accessory, slot and configuration in Appendix B. Then go to Step 2.

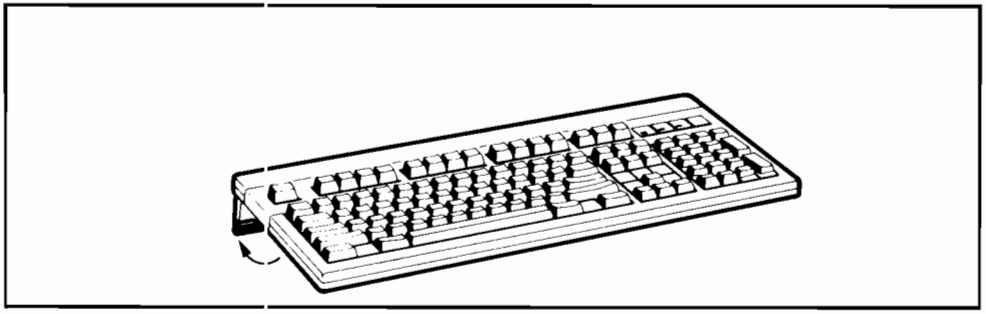
2. **Connect the keyboard to the computer.** (The round connector that plugs into the computer should have the alignment "notch" facing upwards.)



3. Slide the straight section of the keyboard cable under the cable retainer. Make sure it feeds out of the notch at the end of the cable retainer.

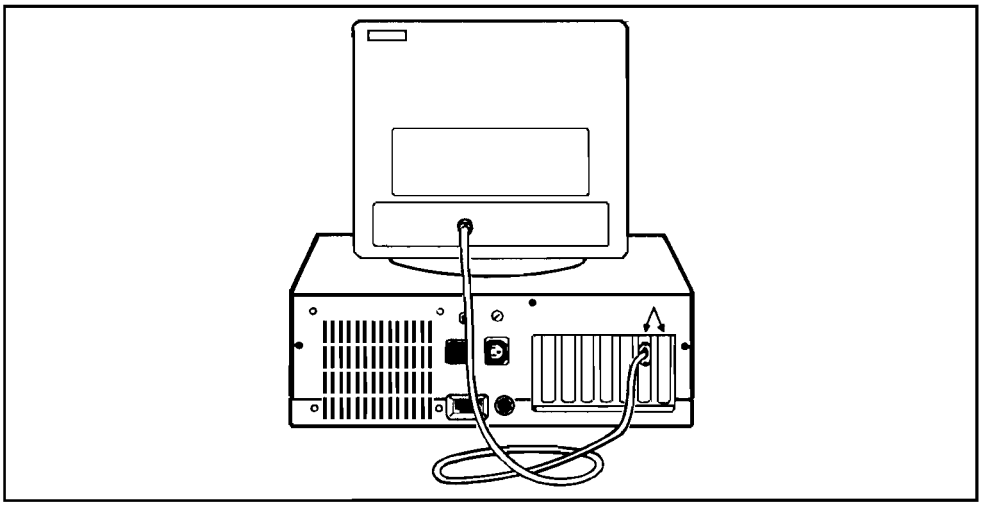


4. Flip out the built-in keyboard stand to tilt your keyboard up for more comfortable typing.

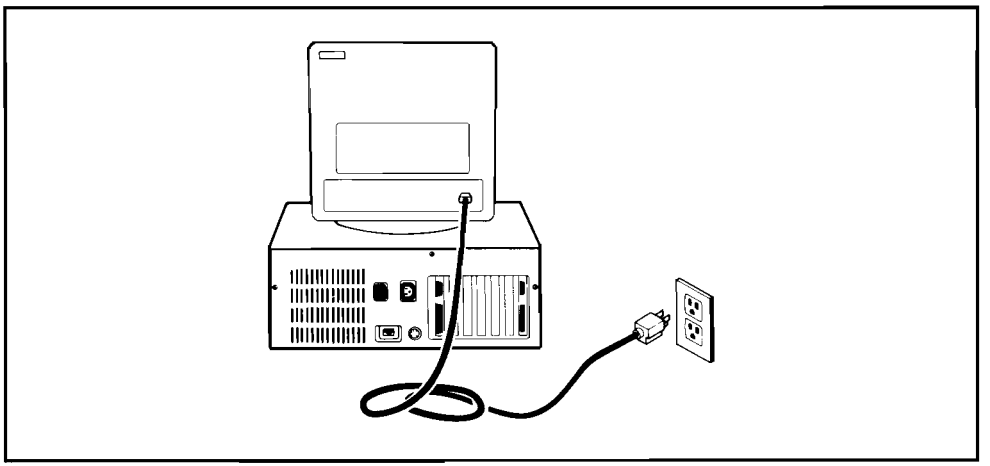


5. Place the display on top of the computer.

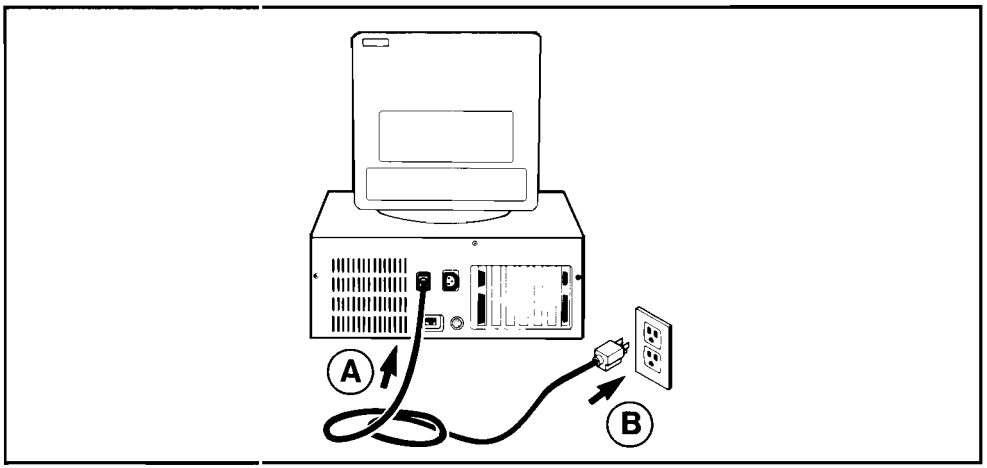
6. **Connect the display's video cable to the connector on the computer's video adapter (card).** The video adapter is usually located in slot 1 or 2.



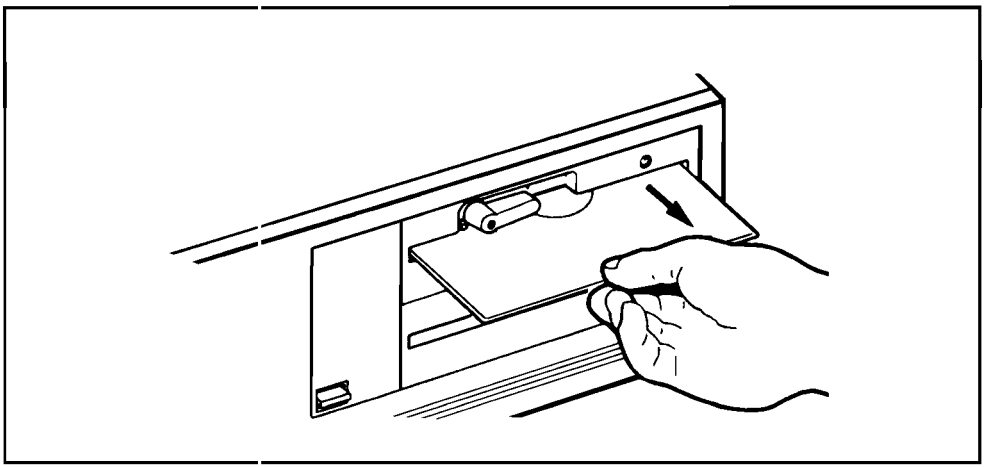
7. **Plug the display's power cable into a grounded (three-hole) AC outlet.**



8. Connect the computer's power cord to the computer (A). Plug the power cord into a grounded (three-hole) AC outlet (B).



9. Remove any cardboard shipping insert which may remain in your flexible disk drive.

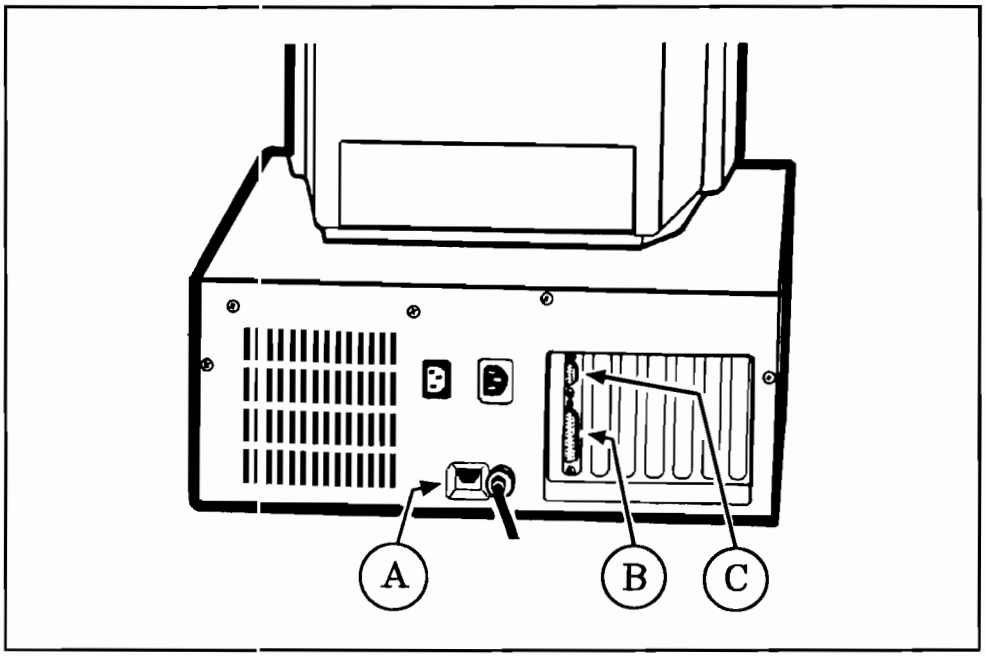


10. **Turn on your computer and configure it by running the SETUP program.**

    You will find the SETUP AND UTILITIES DISK in an envelope packaged with your computer. Refer to Chapter 8, "Configuring Your Computer," for information about running the SETUP program.

11. **Connect your printer, plotter, mouse, or other device to your computer. Tighten the cable screws to secure it to the computer.**

    Your computer comes with three connectors for peripheral devices: an HP-HIL device connector socket for an HP Mouse or Graphics Tablet (A), a 25-pin parallel device port (B), and a 9-pin serial communications port (C).



Note

The HP Mouse and HP Graphics Tablet, like many devices, require the installation of a software driver in order to work. Refer to Chapter 9, "Installing and Using the HP Utilities," for more information.

Before you use your printer or plotter with an application (such as a word processing or spreadsheet application), configure the printer or plotter. Refer to your application manuals for more information.

12. **Install your operating system.**

    Refer to your MS-DOS (or other operating system) manual for instructions.

13. **Install the HP utilities if MS-DOS is your operating system.**

    Refer to Chapter 9, "Installing and Using the HP Utilities," for more information.

14. **Install any utilities and drivers provided with the options and accessories you installed.**

15. **Learn how to use your computer.**

    Refer to Chapter 10, "Using the HP Vectra Enhanced Keyboard," and Chapter 11, "Controlling Computer Functions," for more information.

2

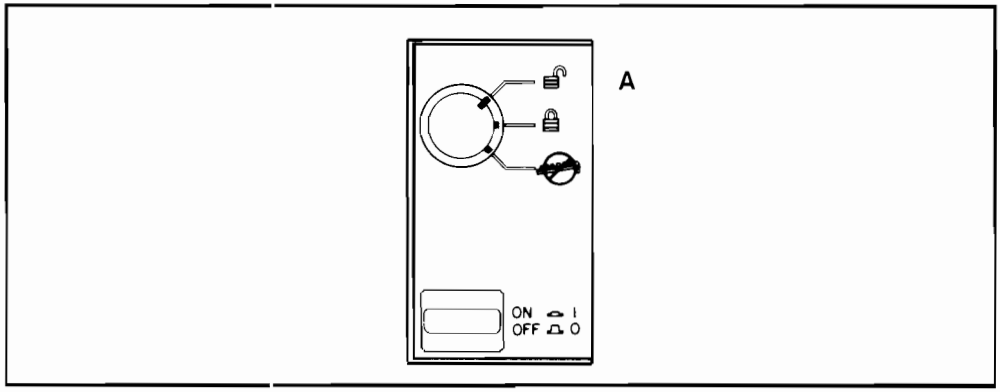
Removing/Replacing the Cover

Removing the Cover

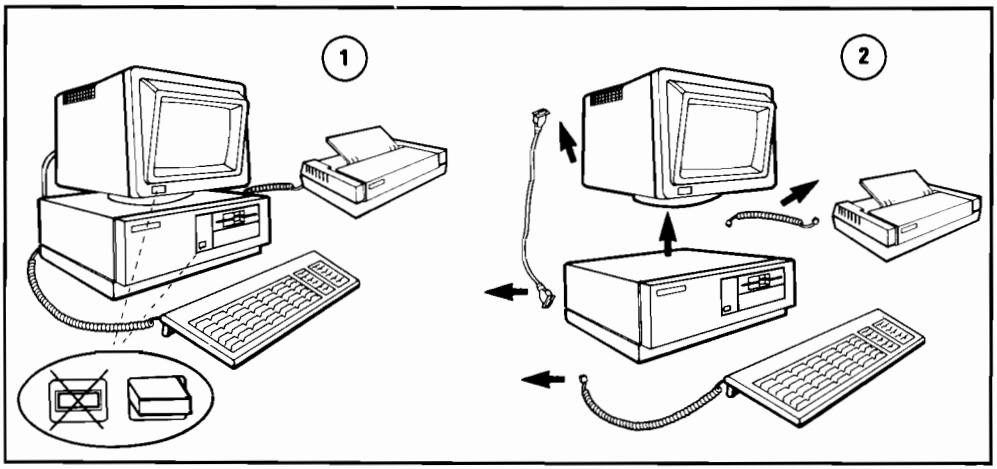
Remove the cover to install accessories that go inside the computer:

- Memory modules
- Numeric coprocessor
- Security lock
- Accessory cards
- Disk drive or tape drive.

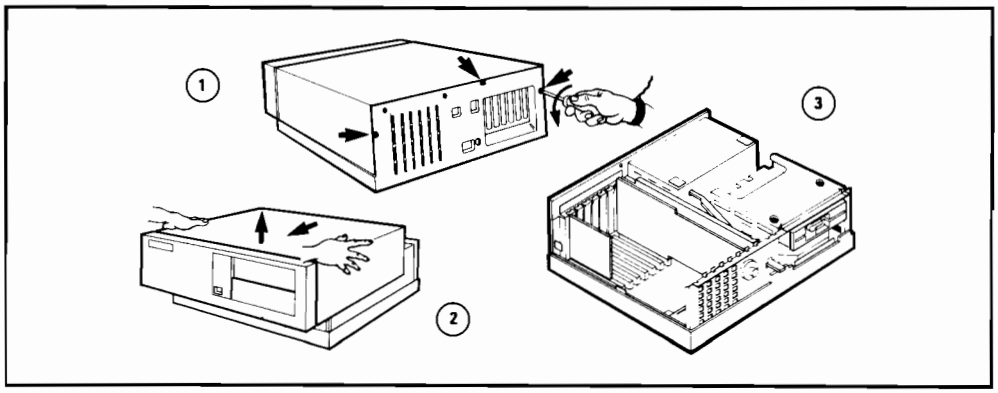
1. **If fitted, set the security lock to the cover unlocked position (A).**



2. **Switch OFF the computer and disconnect all cables.**

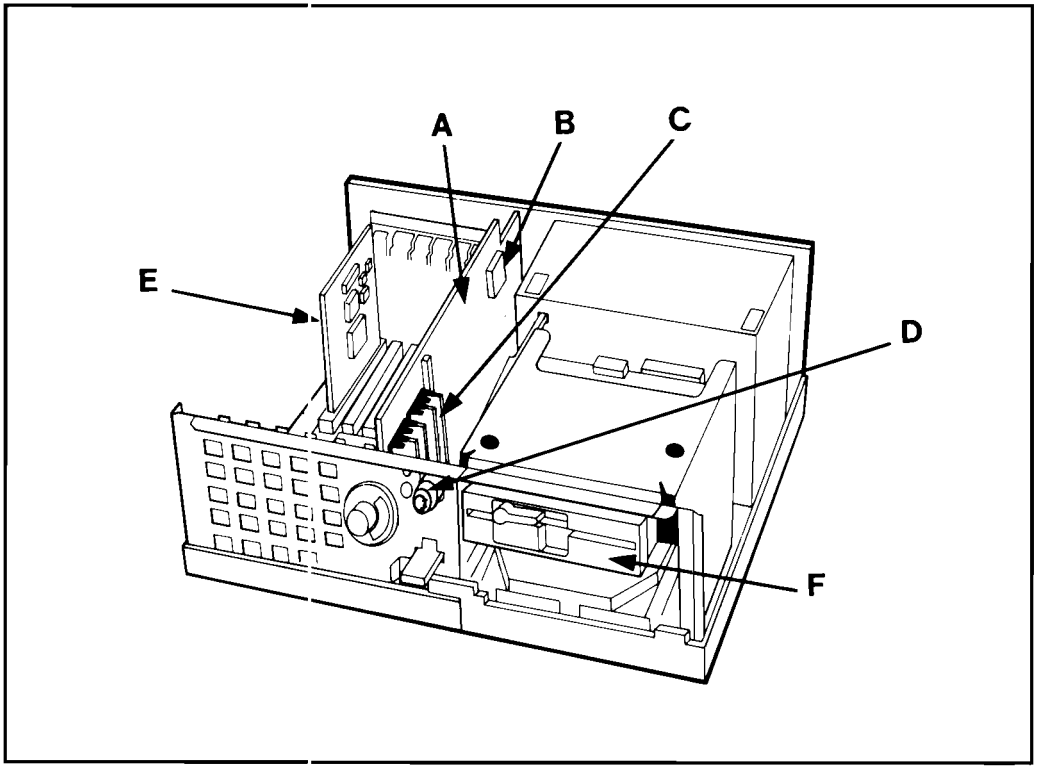


3. **Remove the cover:** Unscrew and remove the screws. Slide the cover forward 4 cm (1.5 inches). Lift it off.



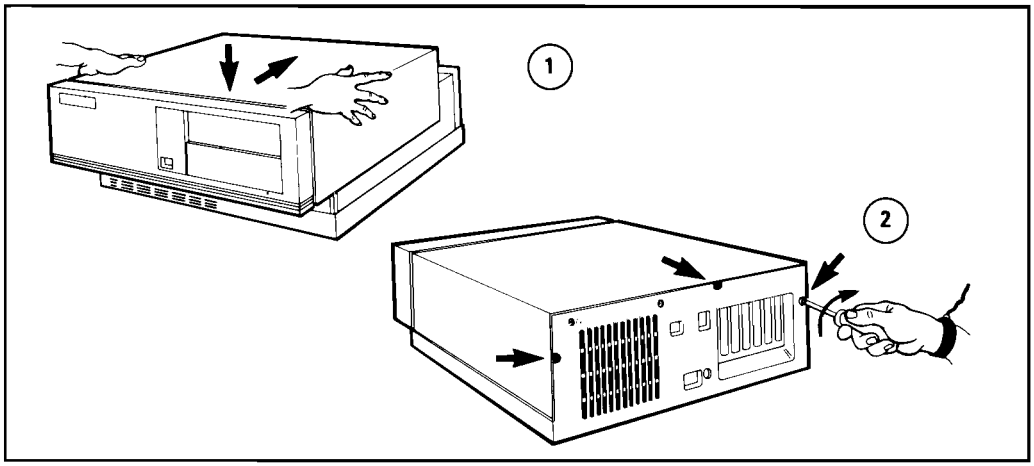
Location of Options/Accessories

A = Processor/Memory Card	see Chapter 3
B = Numeric coprocessor	see Chapter 4
C = Memory modules	see Chapter 4
D = Security lock	see Chapter 5
E = Accessory cards	see Chapter 6
F = Disk or tape drives	see Chapter 7



Reinstalling the Cover

Replace the cover: Lower the cover onto the computer, 4 cm (1.5 inches) from the rear panel. Slide the cover into place. Replace and tighten the screws.



Where to Go Next

When you have finished installing options/accessories in the computer, read Chapter 1 to connect the keyboard and display, and complete the setup process.

3

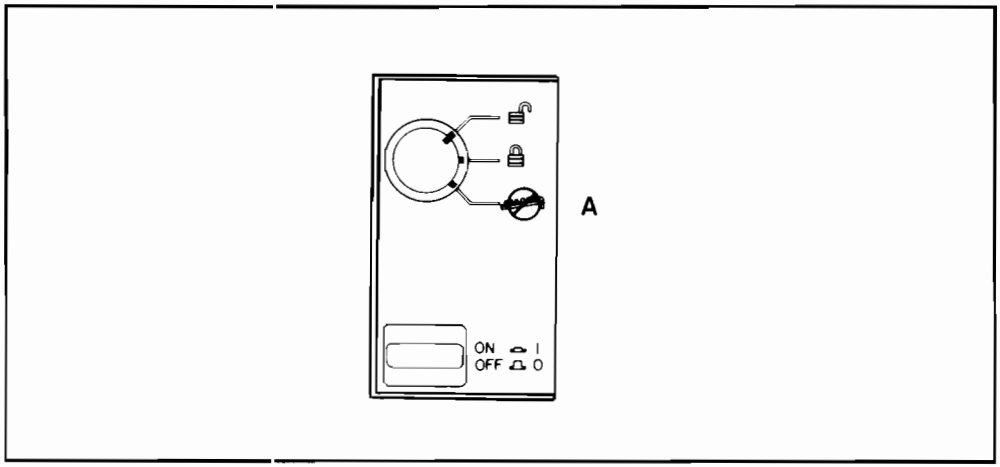
Removing/Replacing the Processor/Memory Card

Removing the Processor/Memory Card

Remove the Processor/Memory Card to install:

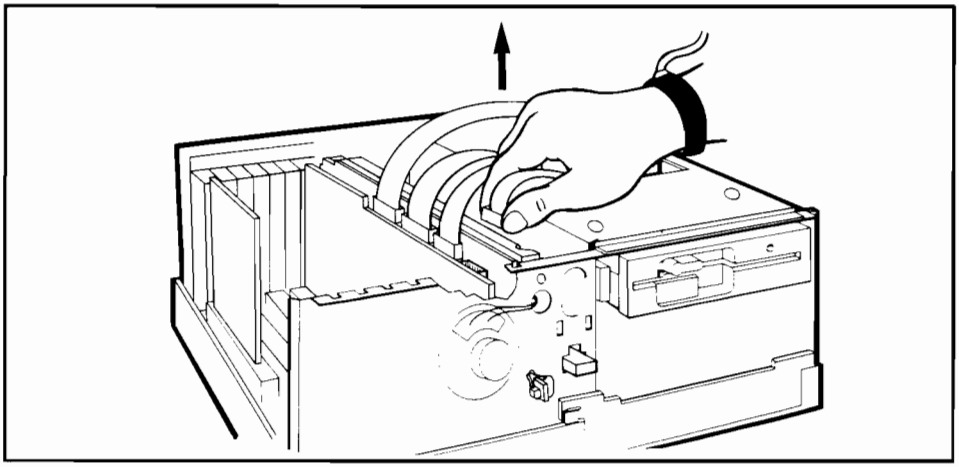
- Memory modules
- Numeric coprocessor
- Security lock.

1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **If fitted, set the security lock to the keyboard locked position (A).**

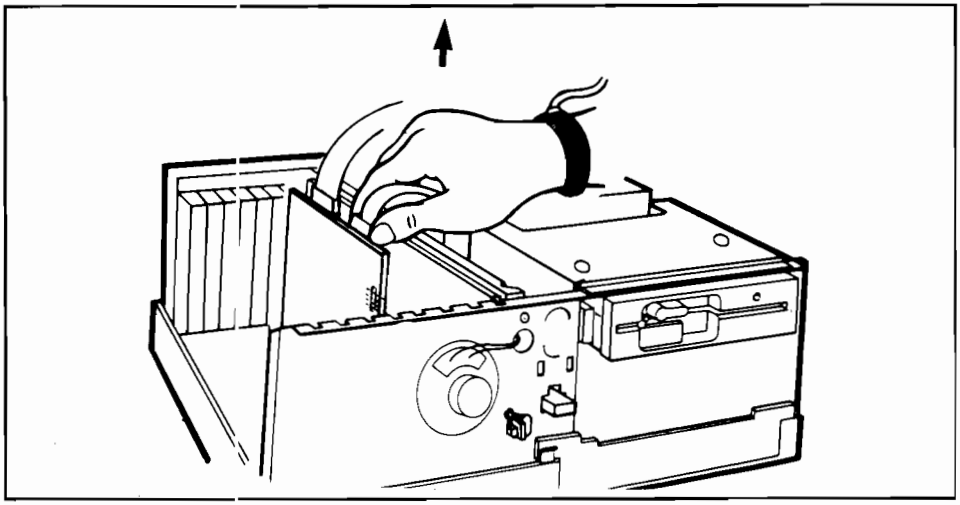


3. **Unplug all the cables from the controller card (slot 7).**
   There are several different types of controller card, depending on the disk drive installed in the computer (see Chapter 13 for details).

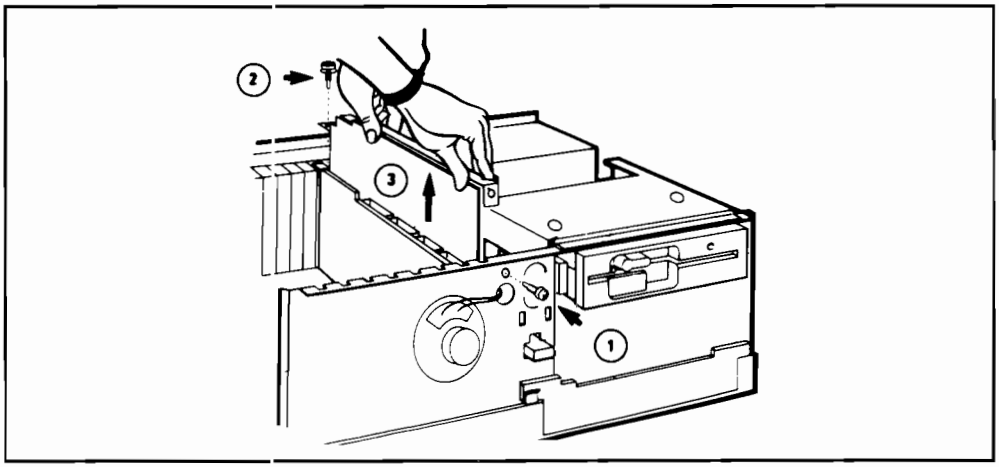
   a. If you have an ST-506 or ESDI controller card, remove ALL the cables as shown below:



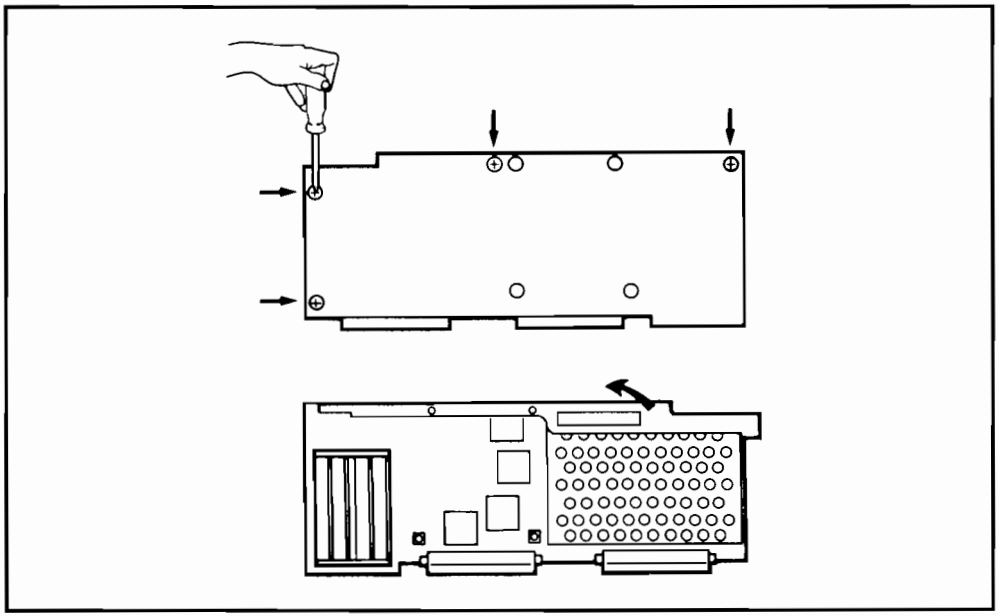
b. AT Multifunction Controller Card (for embedded-AT disk), remove the cables.



4. **Unscrew and remove the Processor/Memory Card (slot 8).**



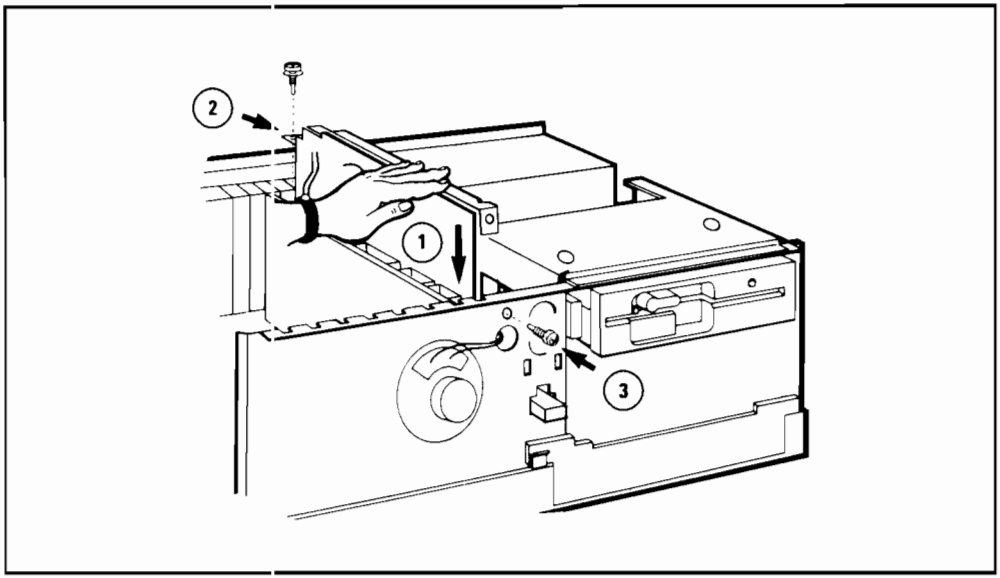
5. **If you are going to install a numeric coprocessor:** Some Processor/Memory Cards have a metal cover over the coprocessor socket. If your card has a metal cover, remove it as follows:
   - QS/20: Remove the Memory Extension Card (if used). See Chapter 4.
   - Remove the metal cover:
     - Unscrew and remove the screws at the **back** of the Processor/Memory Card.
     - Lift off the metal cover from the **front** of the Processor/Memory Card.



Read Chapter 4 to install memory modules or a coprocessor.
Read Chapter 5 to install a security lock.

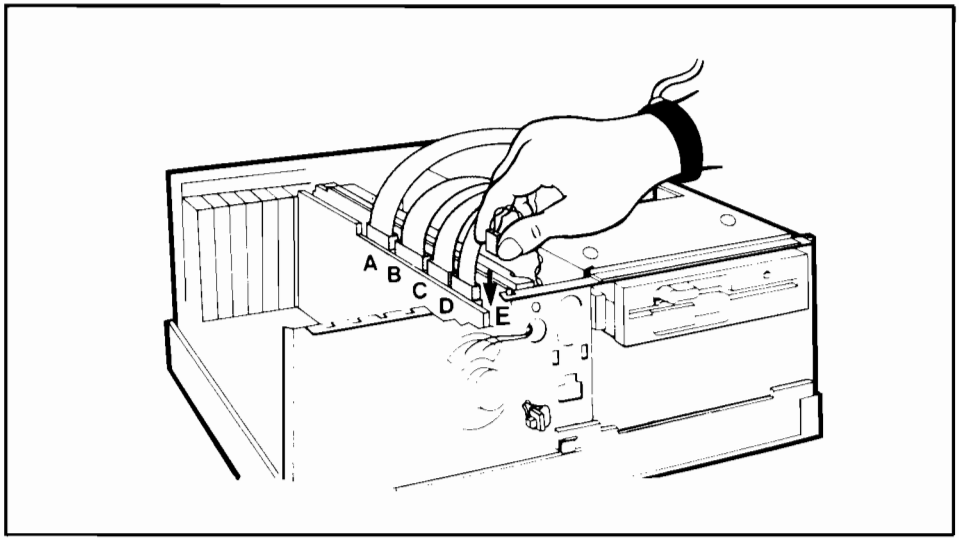
Reinstalling the Processor Card

1. **If you removed a metal cover from the Processor/Memory Card, replace it.**
2. **QS/20: If you removed the Memory Extension Card from the Processor/Memory Card, replace it.** See Chapter 4.
3. **Replace the Processor/Memory Card (slot 8).** Replace and tighten the screws.

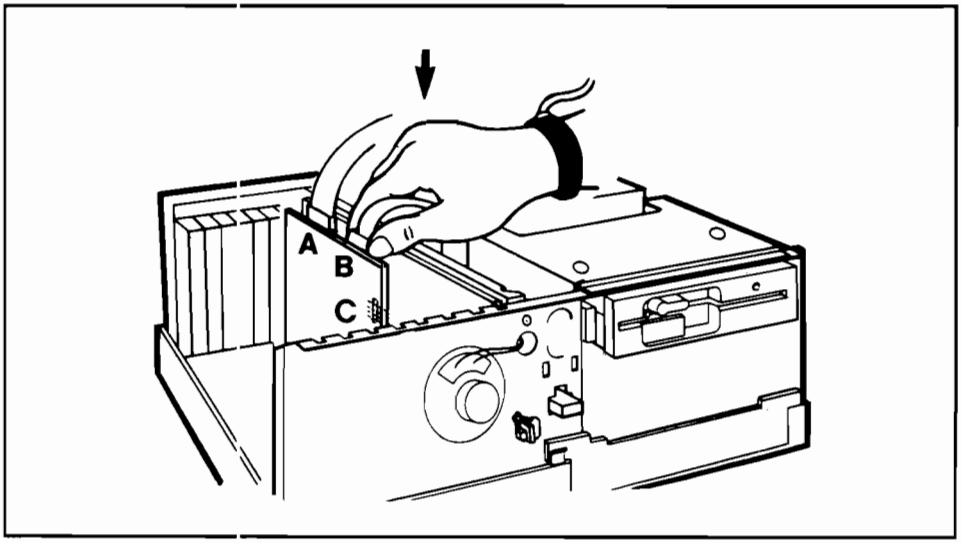


4. **Replace the cables on the controller card (slot 7).**

   a. For an ST-506 or ESDI controller card:
   A = flexible disk(s) cable, B = hard disk(s) control cable,
   C = first hard disk data cable, D = second hard disk data cable,
   E = disk activity light wire.



b. For an AT Multifunction Controller Card (embedded-AT disk):
A = flexible disk(s) cable, B = hard disk(s) control cable,
C = disk activity light wire.



Where to Go Next

Read Chapter 6 to install accessory cards.
Read Chapter 7 to install disk or tape drives.

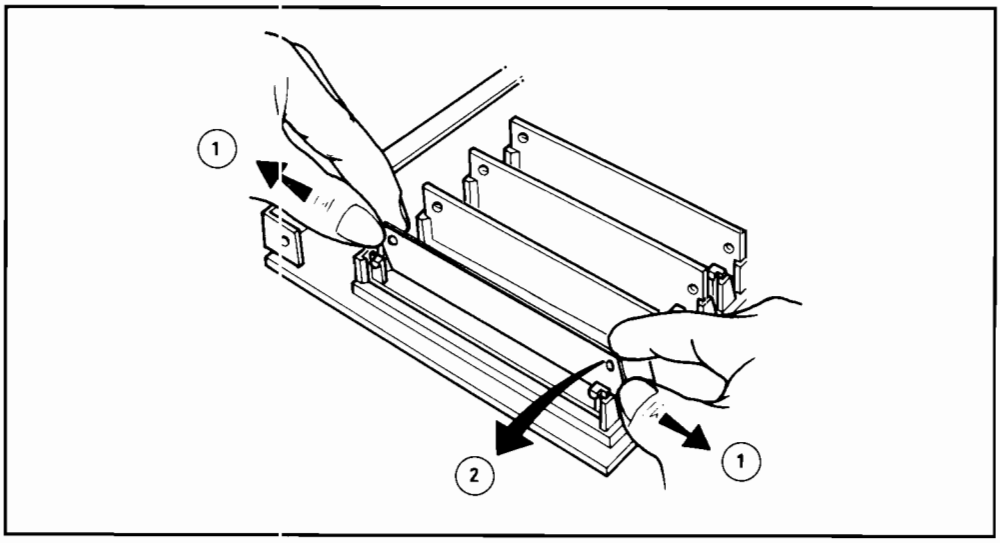
If you have finished installing options/accessories, replace the cover as described in Chapter 2. Then connect the keyboard and display as described in Chapter 1.

4

Installing Memory Upgrade Modules or a Coprocessor

Installing Memory Modules

1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **Remove the Processor/Memory Card.** See Chapter 3.
3. **QS/20: Remove the memory modules already installed on the Processor/Memory Card.** This is for ease of access for installing new modules. (The location of the memory modules is shown in the section "Where to Add Memory to the QS/20".)



Where to Add Memory to the QS/20

The QS/20 Processor/Memory Card has eight memory sockets labeled "A" and "B" alternatively, for a maximum of 8 MB.

A memory extension card is available with eight additional memory sockets labeled "C" and "D" alternatively, for an additional 8 MB.

Table 4-1 lists where to add memory.

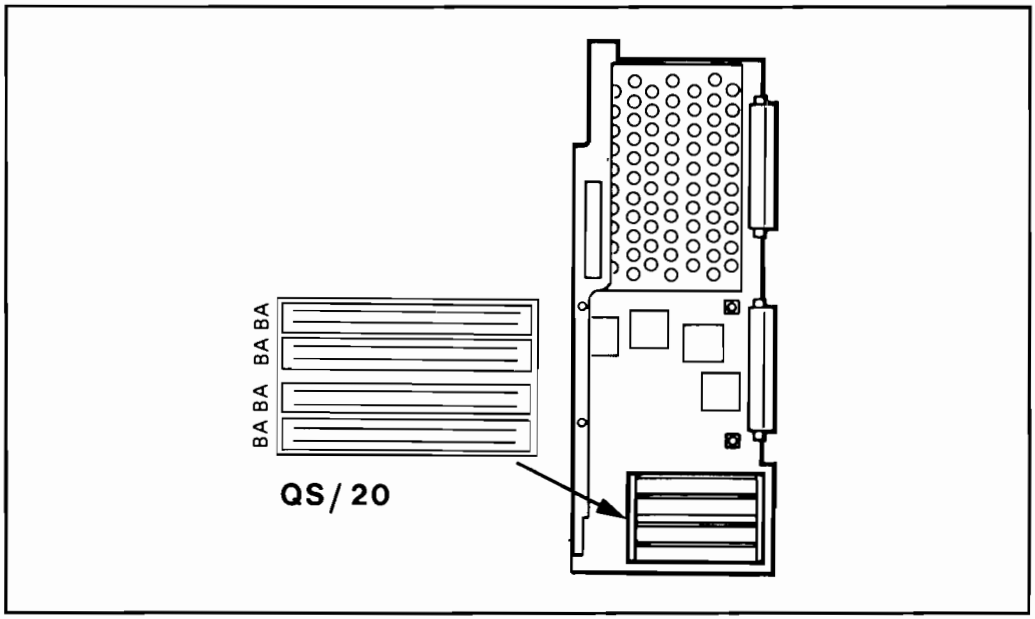


Table 4-1. How To Add Memory to the QS/20

For a TOTAL MEMORY of:	Install these modules:	In:	With Upgrade Kit:
1 MB	4 x 256 KB	All "A" sockets	Standard: No upgrade kit required
2 MB	8 x 256 KB	All "A" and "B" sockets	One 1 MB upgrade kit
4 MB	16 x 256 KB **or** 4 x 1 MB*	All "A", "B", "C" and "D" sockets **or** All "A" sockets	Either three 1MB upgrade kits and Memory Extension card, or one 4 MB upgrade kit
8 MB	8 x 1 MB*	All "A" and "B" sockets	Two 4 MB upgrade kits
10 MB	8 x 1 MB **and** 8 x 256 KB	All "A" and "B" sockets **and** All "C" and "D" sockets	Two 4 MB upgrade kits, one 1 MB upgrade kit and one HP Memory Extension card
16 MB	8 x 1 MB **and** 8 x 1 MB*	All "A" and "B" sockets **and** All "C" and "D" sockets	Four 4 MB upgrade kits and one HP Memory Extension card

* The four original 256 KB Modules are unused.

Where to Add Memory to the QS/16S

The QS/16S Processor/Memory Card has eight memory sockets for a maximum of 8 MB. Each pair of sockets form a "bank", and the banks are labeled "0", "1", "2" and "3".

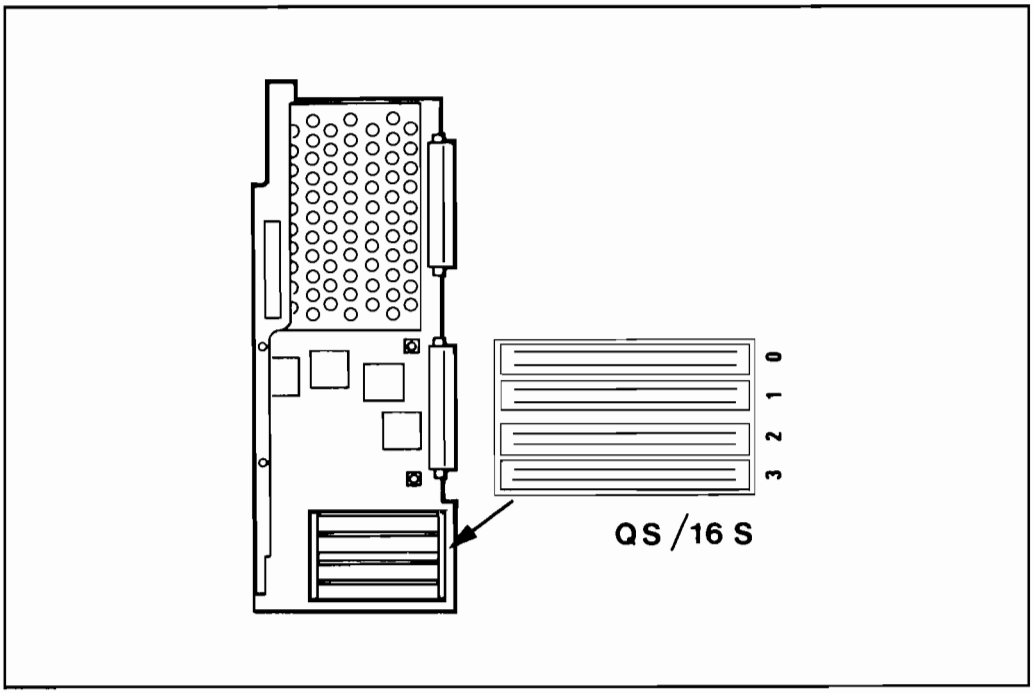


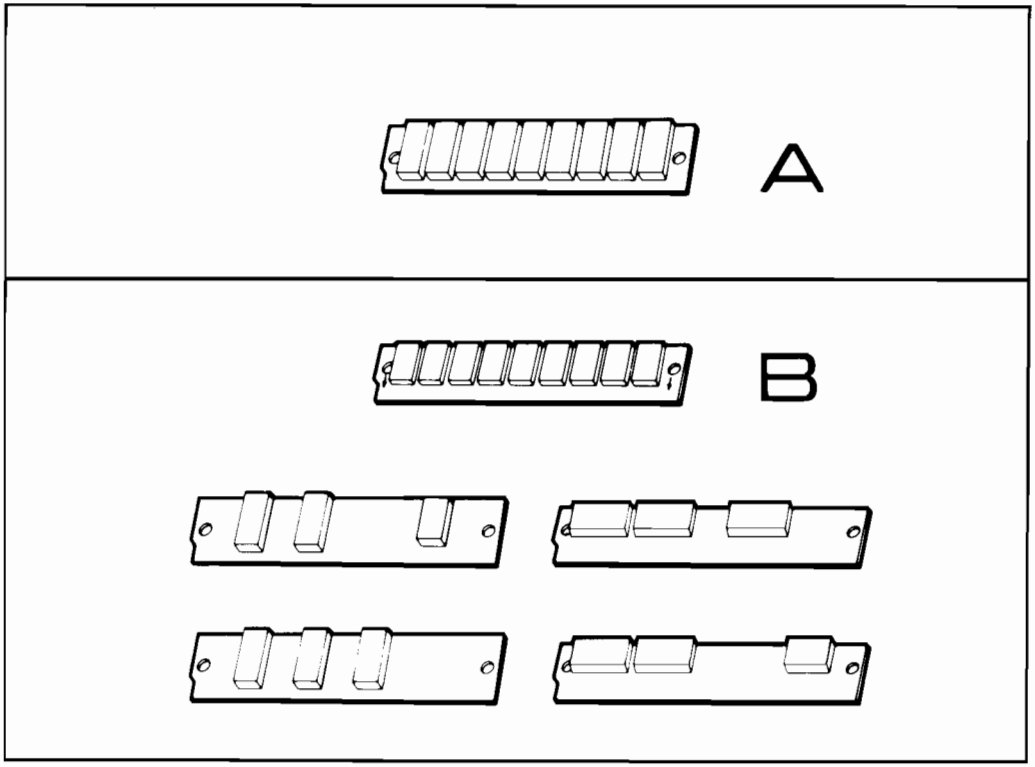
Table 4-2 lists where to add memory. It is recommended that you use either 1 MB or 5 MB or 8 MB of memory.

Table 4-2. How to Add Memory to the QS/16S

For a TOTAL MEMORY of:	Install These Modules:	In:	With Upgrade Kit:
1 MB	4 x 256 KB	All sockets in "0" and "1" banks	Standard: No upgrade kit required
2 MB	8 x 256 KB	All sockets in "0", "1", "2" and "3" banks	One 1 MB upgrade kit
3 MB	4 x 256 KB **and** 2 x 1 MB	All sockets in "0" and "1" banks **and** All sockets in "2" bank	One 2 MB upgrade kit
4 MB	4 x 1 MB*	All sockets in "0" and "1" banks	One 4 MB upgrade kit
5 MB	4 x 256 KB **and** 4 x 1 MB	All sockets in "0" and "1" banks **and** All sockets in "2" and "3" banks	One 4 MB upgrade kit
6 MB	6 x 1 MB*	All sockets in "0", "1" and "2" banks	One 4 MB and one 2 MB upgrade kit
8 MB	8 x 1 MB*	All sockets in "0", "1", "2" and "3" banks	Two 4 MB upgrade kits

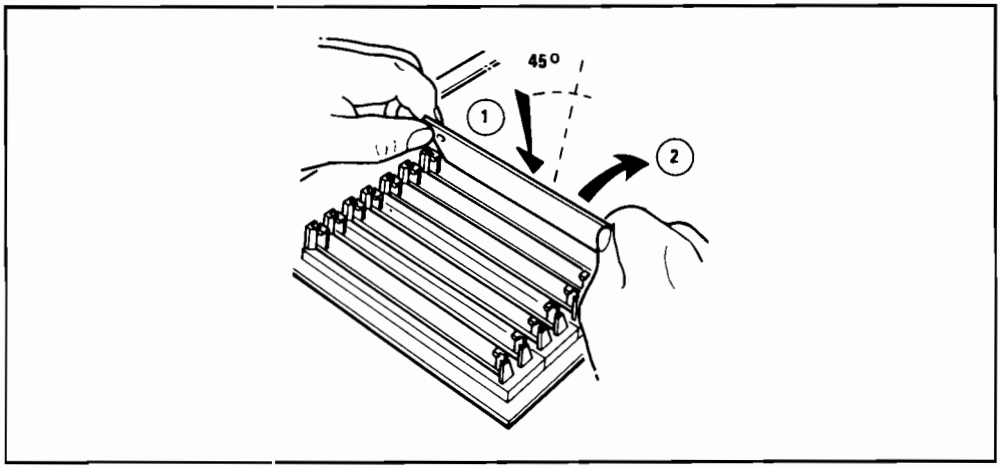
* The four original 256 KB Modules are unused.

Typical memory modules: A = 1 MB, B = 256 KB.

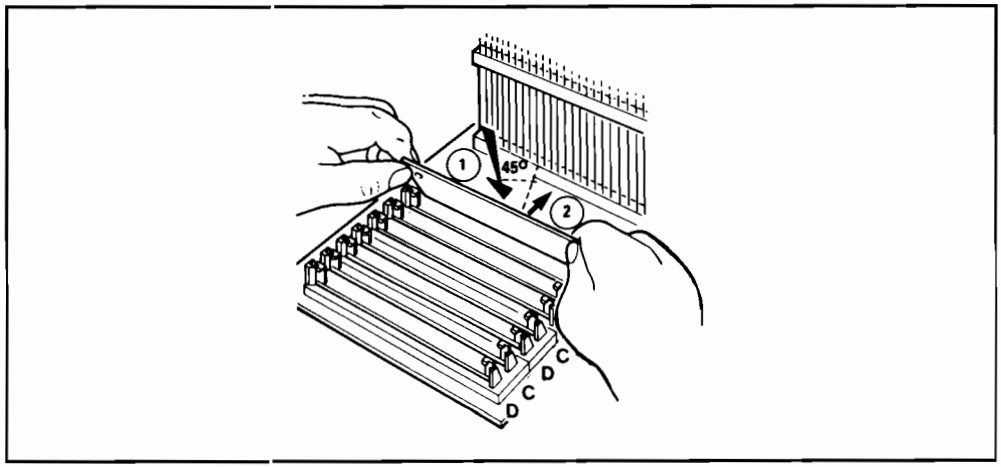


The QS/16S uses 100 nanosecond memory modules.
The QS/20 uses 80 nanosecond memory modules.

1. **Install the memory modules on the Processor/Memory Card.** Table 4-1 (for QS/20) or 4-2 (for QS/16S) shows where to add the modules.

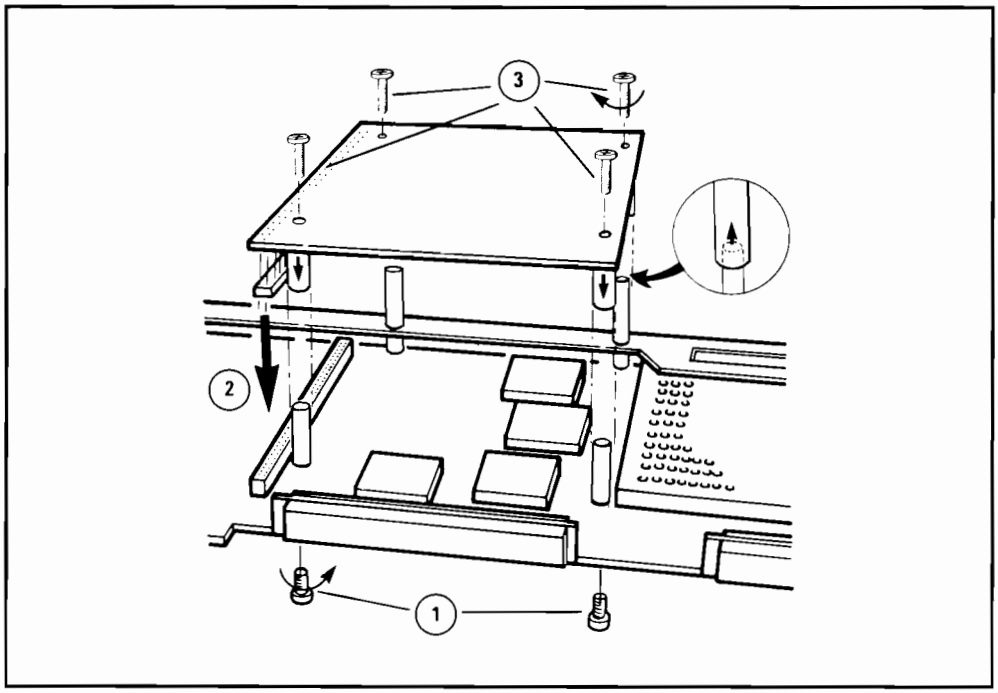


2. **QS/20: Install the memory modules on the Memory Extension Card, if used.**



3. **QS/20: Install the Memory Extension Card on the Processor/Memory Card, if used.**

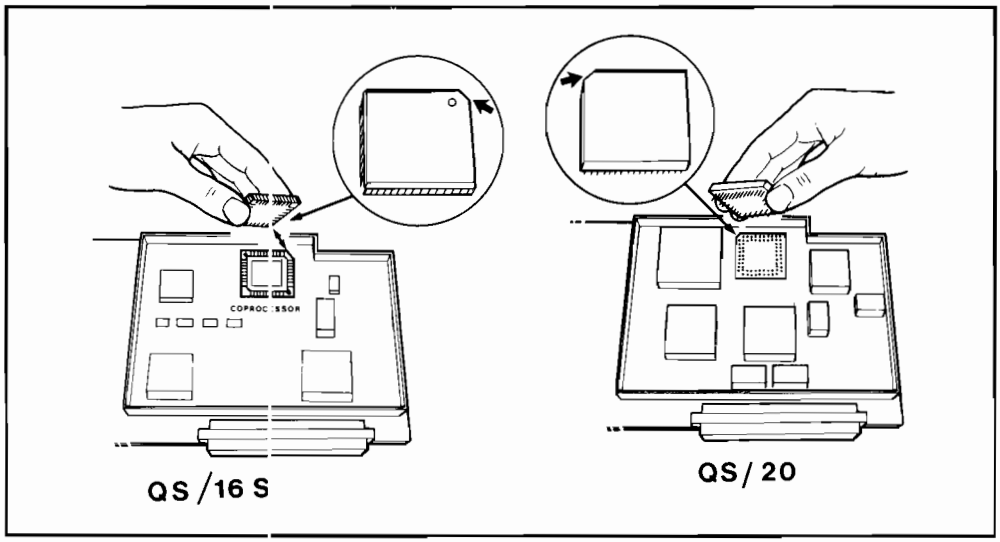
   (1) Screw the four spacers to the Processor/Memory Card.
   (2) Place the Memory Extension Card over the spacers on the Processor/Memory Card. Then press the Memory Extension Card's connector into the connector on the Processor/Memory Card.
   (3) Screw the Memory Extension Card to the Processor/Memory Card.



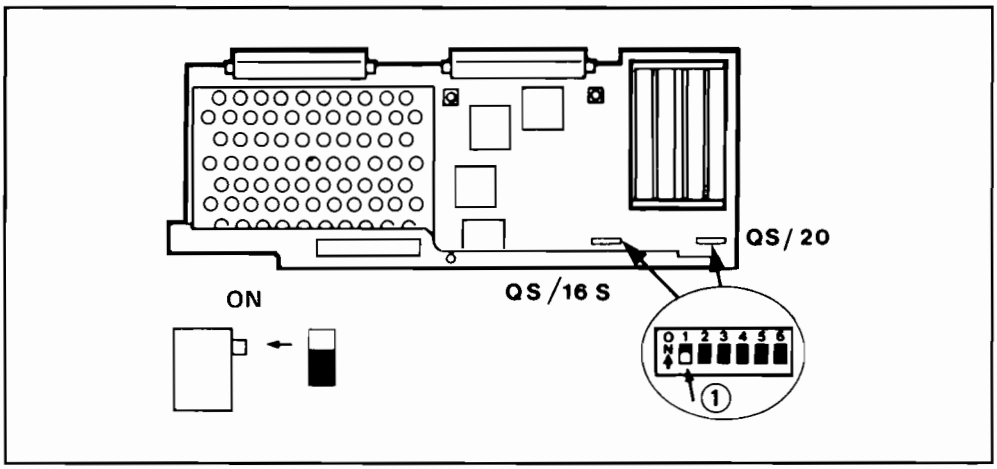
Read the next section to install a coprocessor.
Then read Where to Go Next at the end of this Chapter.

Installing a Numeric Coprocessor

1. **Switch off the computer and remove the cover.** See Chapter 2.
2. **Remove the Processor/Memory Card.** See Chapter 3.
3. **If fitted, remove the metal cover from the Processor/Memory Card.** See Chapter 3.
4. **Locate the corner marker on the chip—typically a broken corner.**
5. **Install the coprocessor.**
   a. Align the coprocessor over the socket—the chip's corner marker over:
      the top-right of the socket, QS/16S.
      the top-left of the socket, QS/20.
   b. Align the coprocessor pins with the holes in the socket.
   c. Press the coprocessor into place.



6. If you removed the metal cover from the Processor/Memory Card, replace it.
7. QS/20: If you removed the Memory Extension Card from the Processor/Memory Card, replace it.
8. Reset switch 1 (on the Processor/Memory Card) to the OFF position.



Where to Go Next

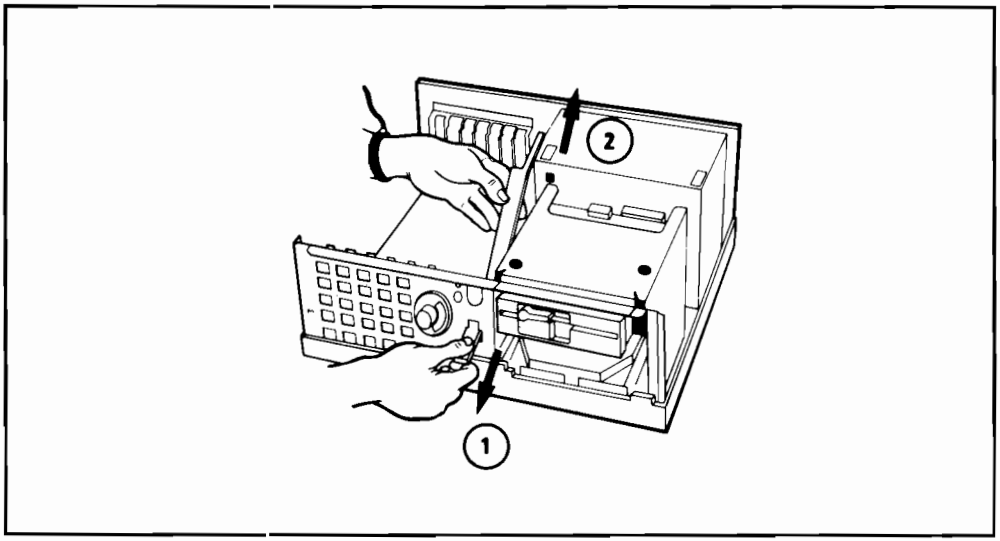
If you want to install a security lock, read Chapter 5.

Otherwise, read Chapter 3 to replace the Processor/Memory Card.

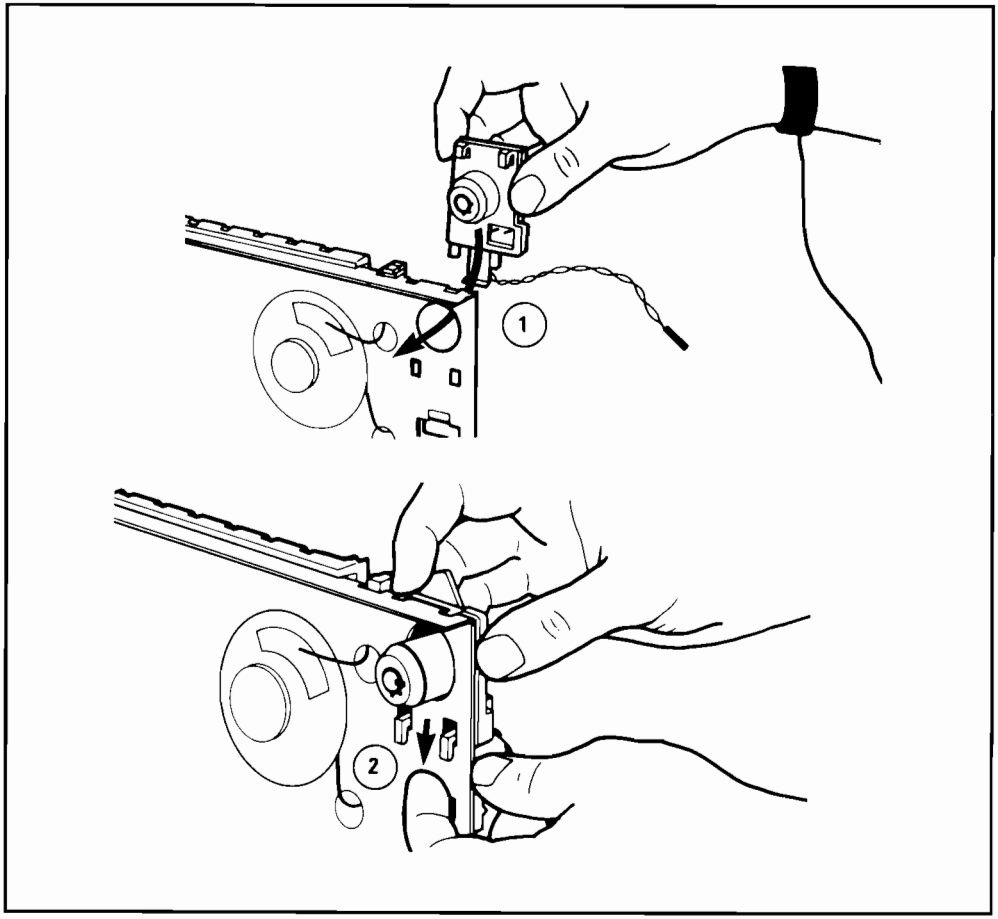
5

Installing a Security Lock

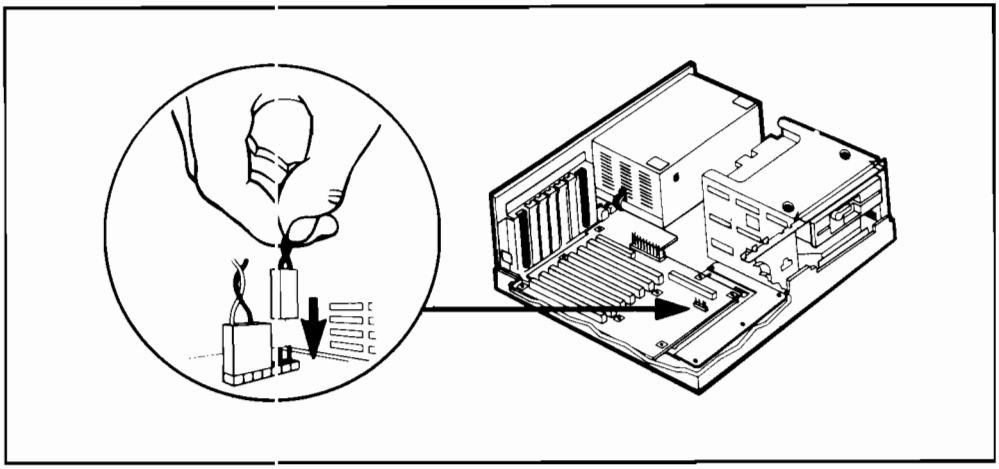
1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **Remove the Processor/Memory Card.** See Chapter 3.
3. **Remove the power shaft.** Firmly pull it out of the power unit, and set it aside.



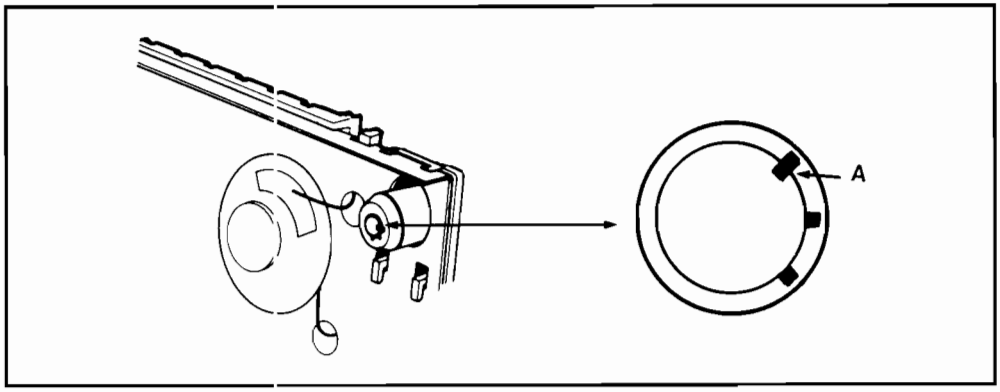
4. **Install the security lock.** From inside the computer, insert the lock through the computer frame, with the four hook-tabs through their holes in the frame. Firmly press down on the lock assembly.



5. Plug the security lock wire into the connector on the System Interface Card.

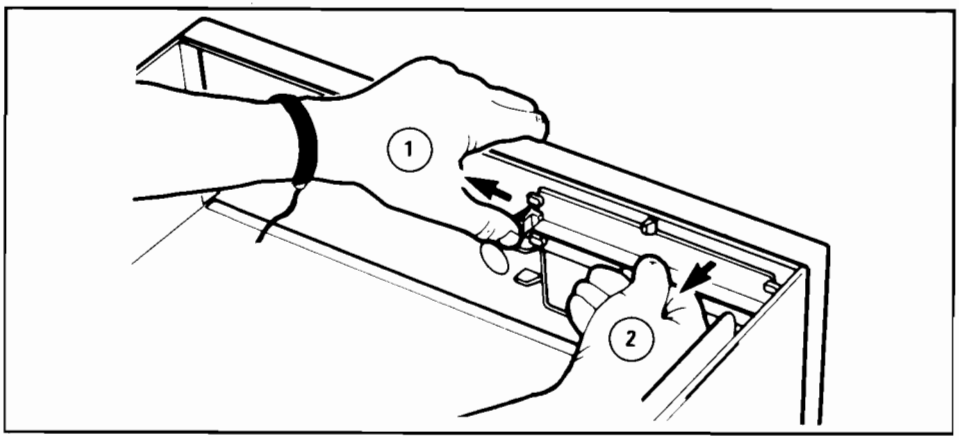


6. Set the security lock to the cover unlocked position (A).

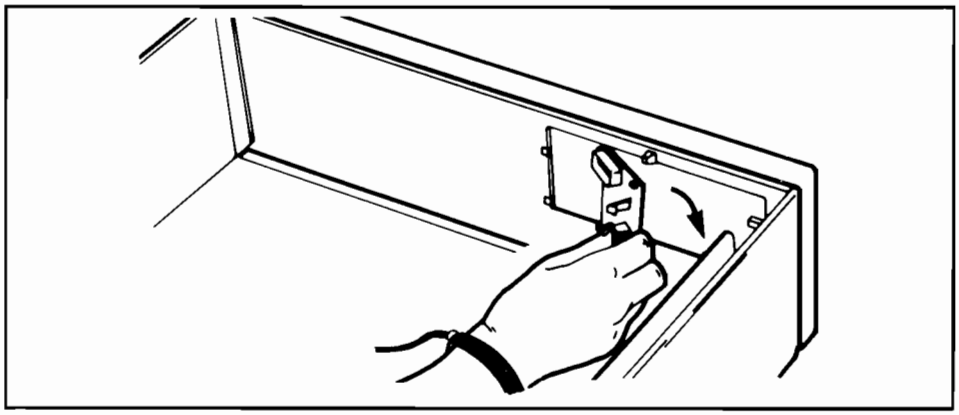


7. **Remove the old power button panel from the cover.** Turn the cover upside down.

   a. Remove the blank panel from the disk slot in computer's cover. Unclip the locking tab, and lift the panel out.

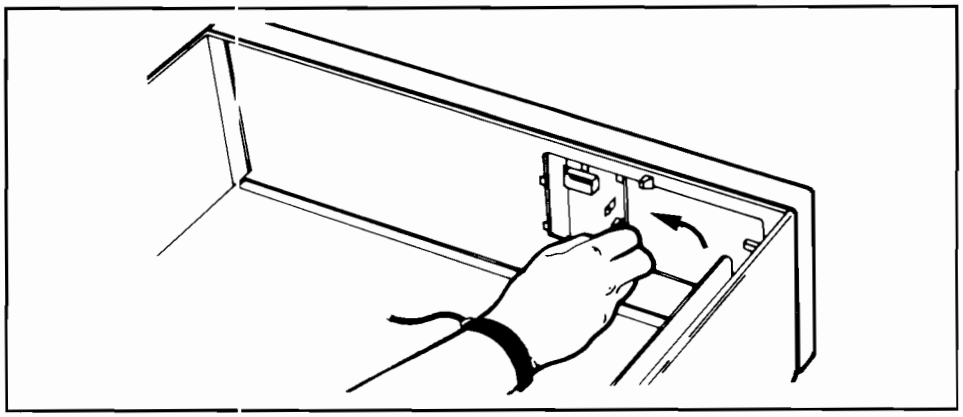


   b. Remove the old power button panel. Pull it firmly over the locking tabs.

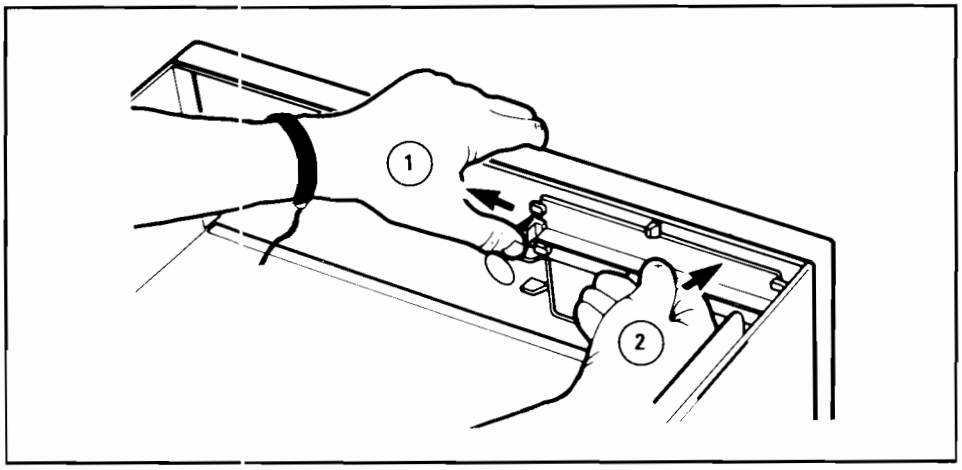


8. **Insert the new power button panel in the cover.**

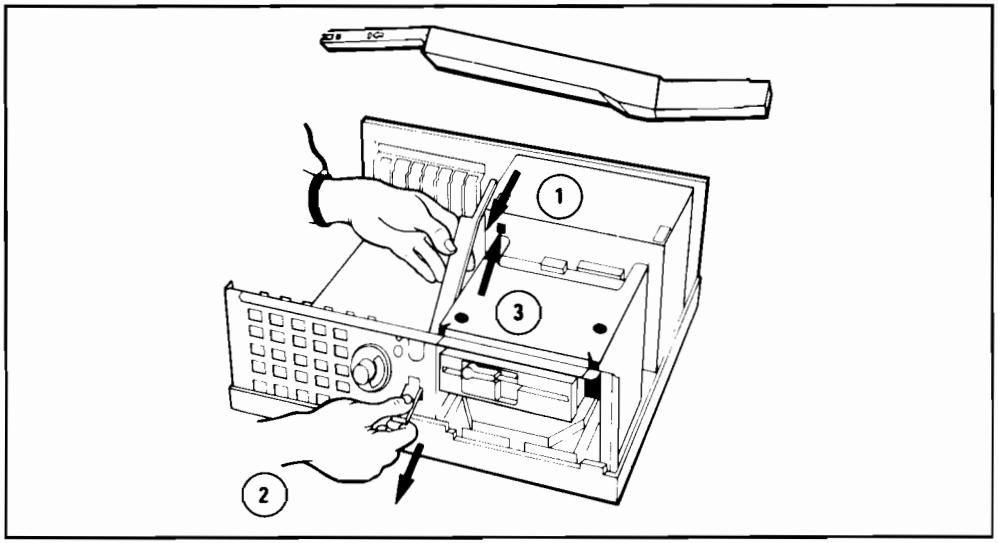
   a. Insert the new power button panel. Push it firmly over the locking tabs.



   b. Reinstall the blank panel in the computer's cover. (Skip this step if you will install a flexible disk drive.)



9. **Reinstall the power shaft.** Ensure it "clicks" into the power unit.



Where to Go Next

Read Chapter 3 to replace the Processor/Memory Card.

6

Installing Accessory Cards

Note

Leave the card in its anti-static bag until you are ready to install it. Handle the card by the edges only.

The computer is delivered with a Processor/Memory Card in slot 8 and a controller card in slot 7

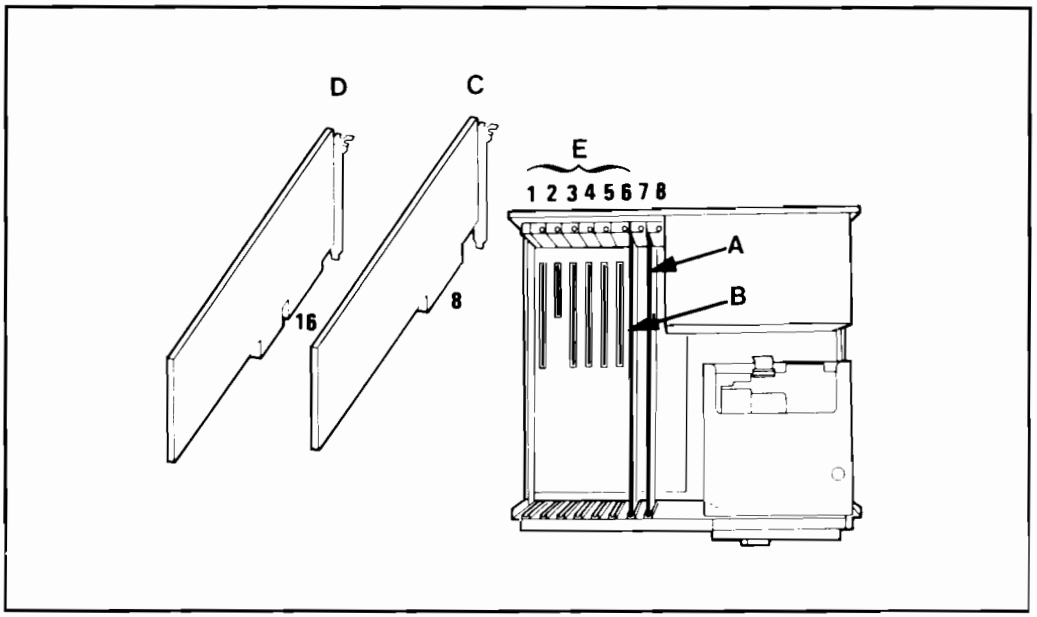
Slots 1 to 6 can be used for your cards:

- Slot 2 for cards fitted with a single 8-bit edge connector.
- Slots 1 and 3 to 6 for cards fitted with a double 16-bit edge connector or with a single 8-bit edge connector.

The controller card has a 9-pin serial connector configured as serial port 1 (COM1), and a 25-pin parallel connector configured as parallel port 1 (LPT1).

If you are installing cards that use a serial or parallel port, make sure they do not use COM1 or LPT1. Alternatively, change the controller card's configuration as described in Chapter 13.

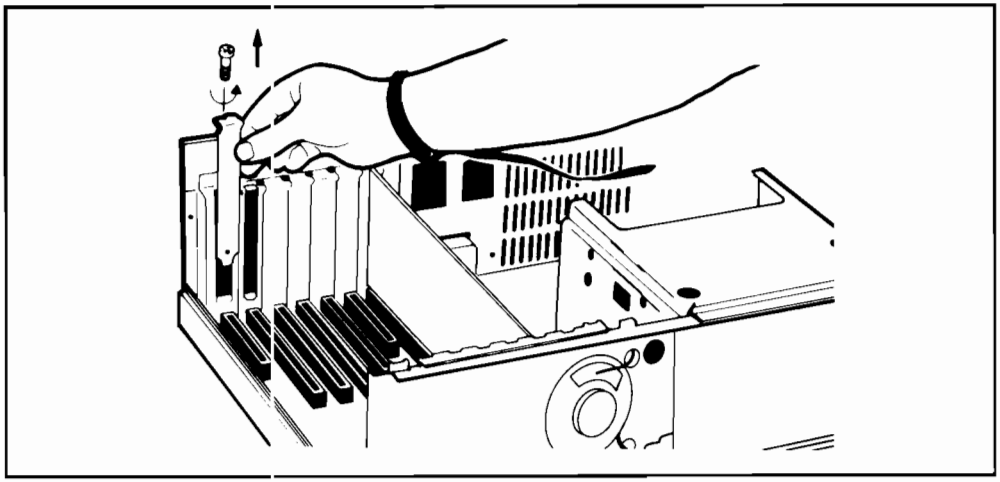
A = Slot 8 - Processor/Memory Card
B = Slot 7 - Controller card
C = 8-bit card
D = 16-bit card
E = Slots 1 to 6 for your cards



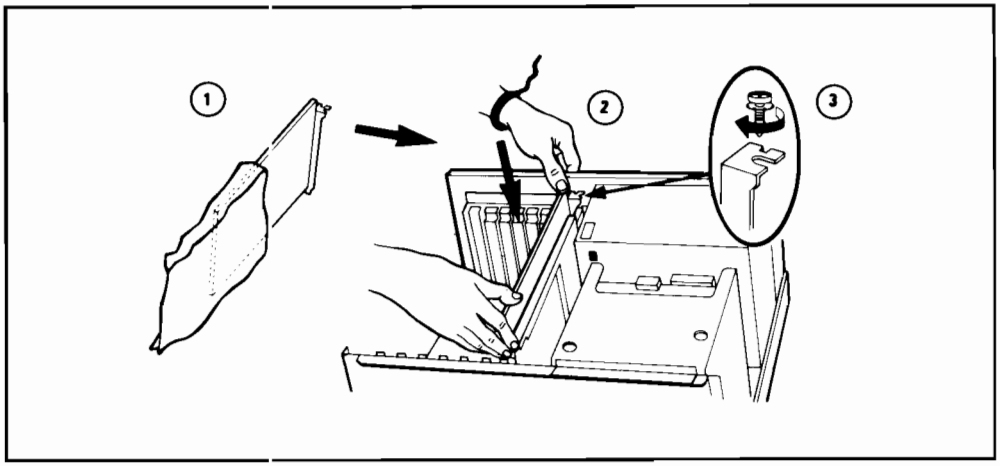
To install a card:

1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **Configure the card.** Refer to the card's manual to see if it has any switch/jumper settings to be changed (set as necessary) or has to be installed in a specific slot.

3. Choose an accessory card slot. Unscrew and remove the slot cover.



4. Insert the accessory card in the slot. Replace and tighten the screw.



Where to Go Next

Read Chapter 7 to install disk or tape drives.

If you have finished installing options/accessories, replace the cover as described in Chapter 2. Then connect the keyboard and display as described in Chapter 1.

7

Installing Internal Disk or Tape Drives

Note

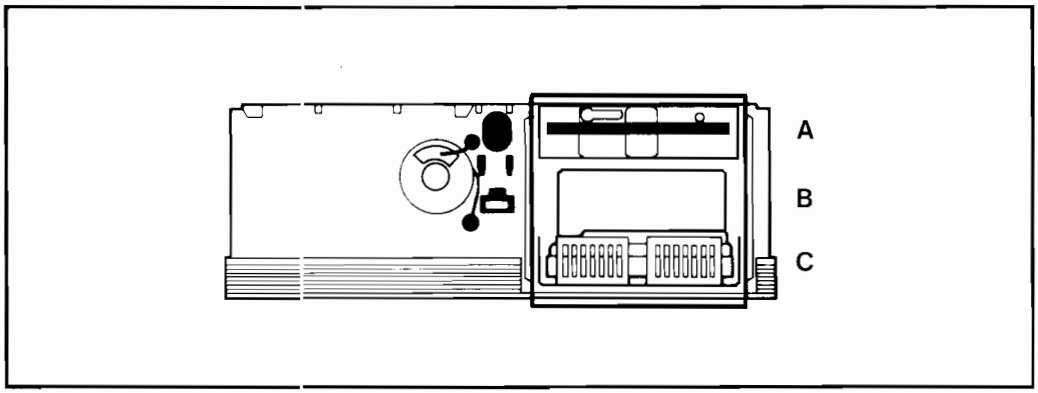
Leave the disk drive in its anti-static bag until you are ready to install it. Handle the drive by the edges only. Do not drop it.

The computer has three shelves for disk drives. It is delivered with a flexible disk drive in the top shelf. The other two shelves can be used for your flexible disk drives or hard disk drives.

If you have a hard disk drive, install it in the bottom shelf first.

If you have a second flexible disk drive or hard disk or tape drive, install it in the middle shelf.

A = Top shelf, B = Middle shelf, C = Bottom shelf



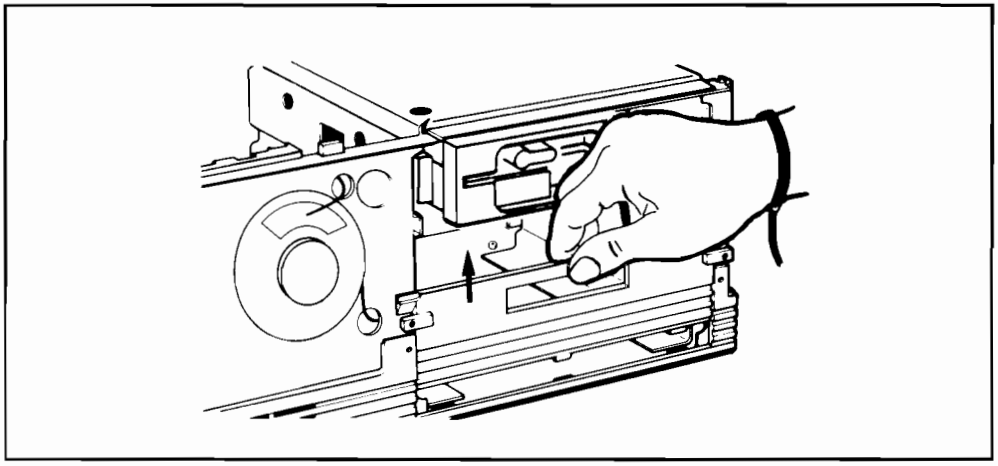
Installing a Hard Disk Drive

Ensure your hard disk drive uses the same type of disk controller that is installed in your computer.

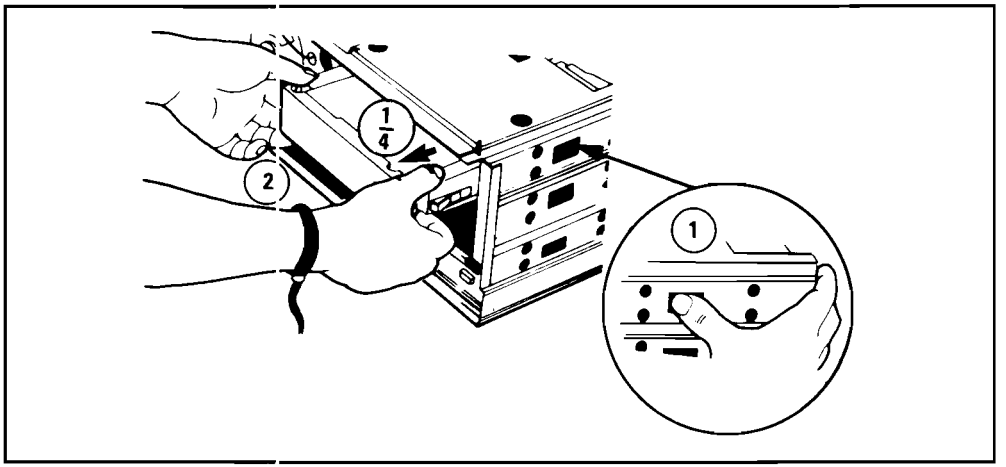
To determine the type of controller, refer to Chapter 13 or Appendix B.

If you are installing a hard disk drive that comes with its own controller card, set this controller to the secondary address (and make sure the controller has a utility to allow it to operate at the secondary address) or disabled.

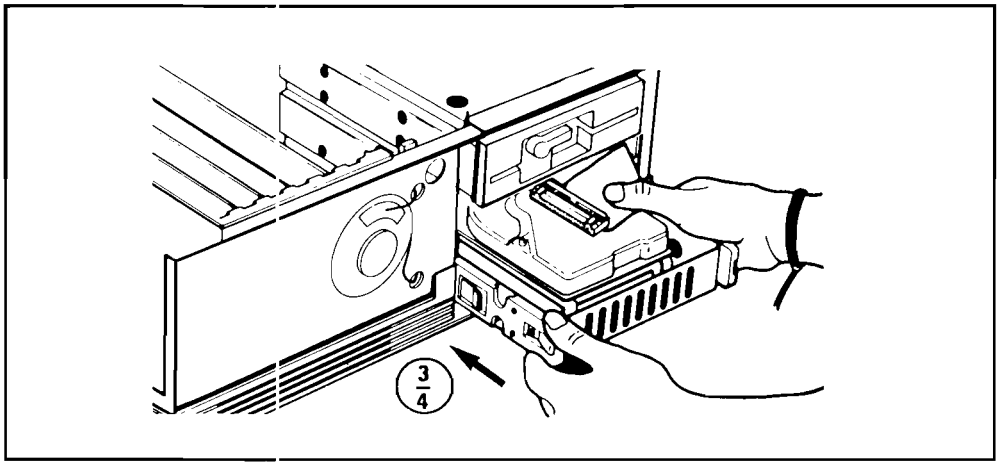
1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **Configure the disk drive.** Refer to the drive's manual to see if it has any jumpers or terminating resistors (set as necessary) or has a special installation procedure.
3. **Remove the blank panel from the hard disk drive slot in the computer.**



4. Slide the flexible disk $^1/_4$ of the way out of the top shelf.

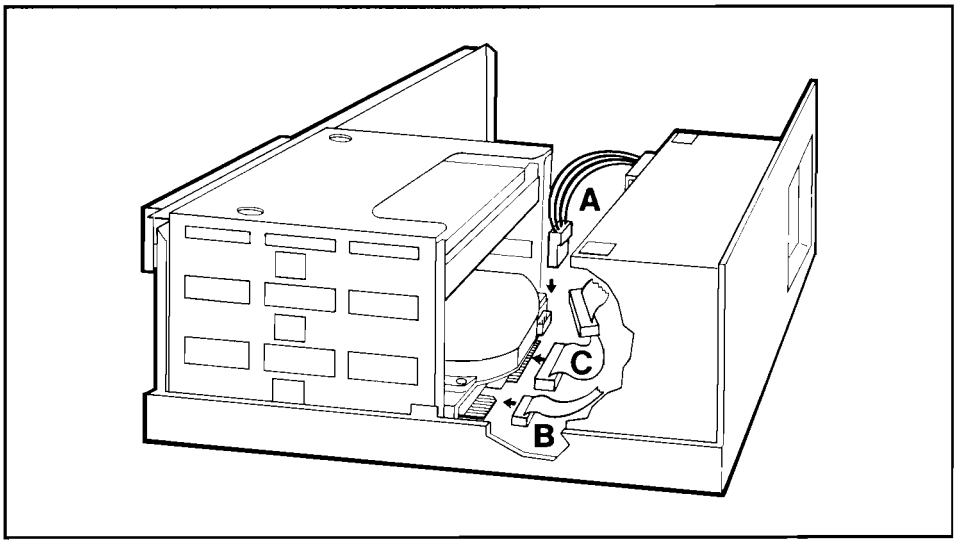


5. Slide the first hard disk drive $^3/_4$ of the way into the bottom shelf.

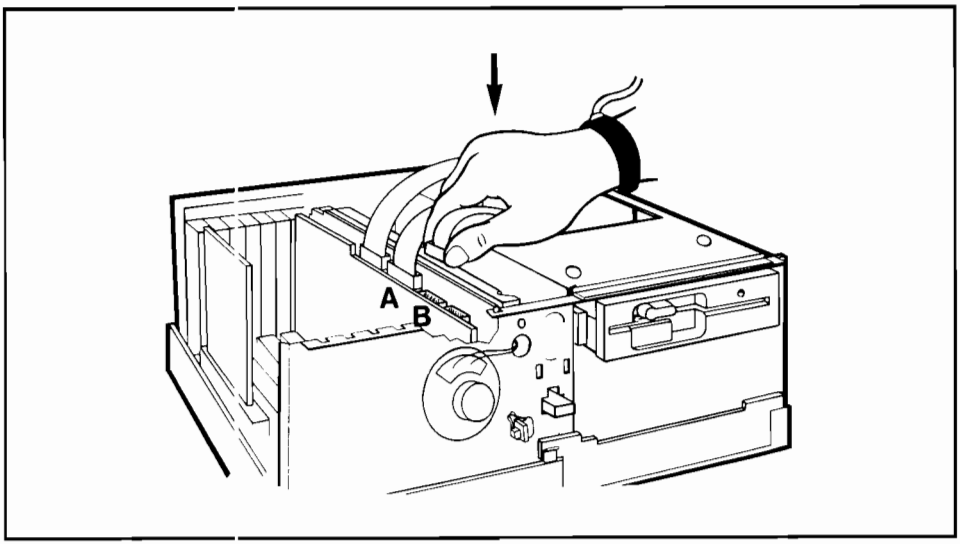


6. **If you are installing an ST-506 or ESDI hard disk drive:**

   a. Plug the power, data (20-pin), and control cable (34-pin) into the drive.
   A = Power cable, B = First hard disk data cable,
   C = Hard disk control cable (use the LAST connector)

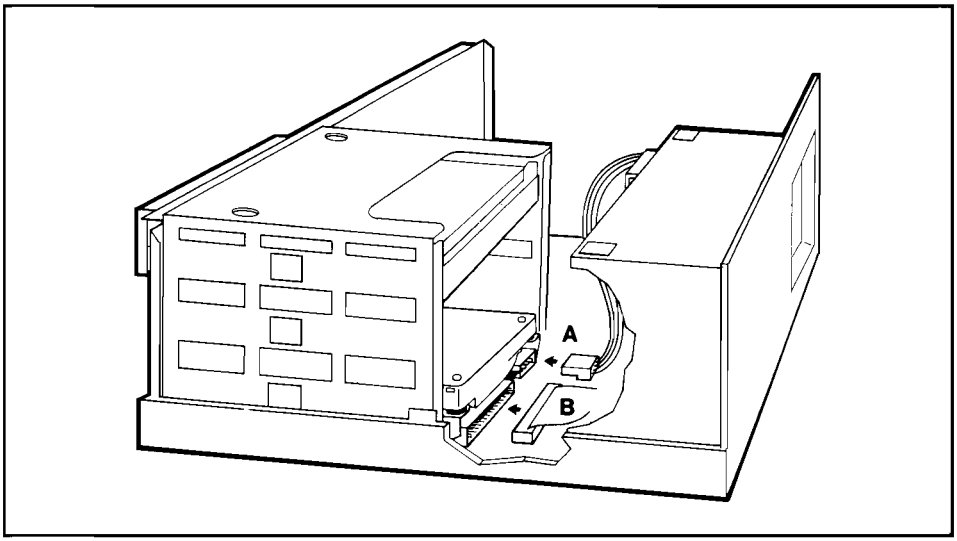


b. Plug the other end of the cables into the ST-506 or ESDI controller card (slot 7).
A = hard disk(s) control cable, B = first hard disk data cable.

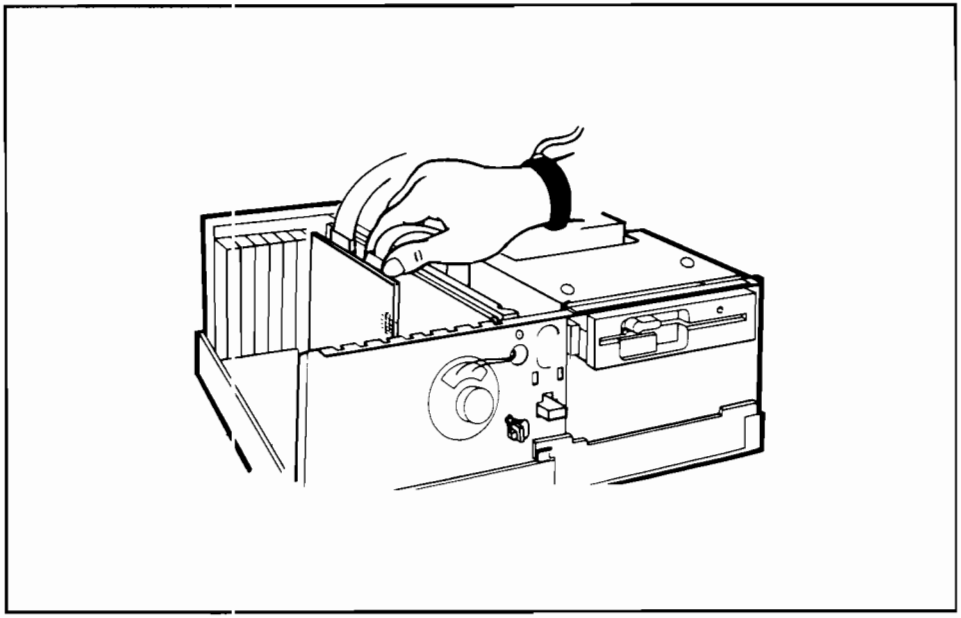


7. **If you are installing an embedded-AT controller hard disk drive:**

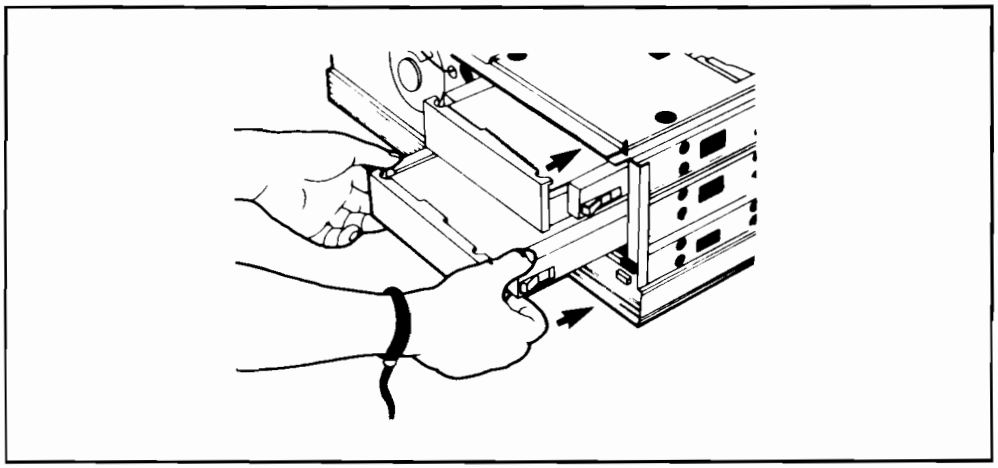
   a. Plug the control (40-pin) and power cables into the drive.
      A = Power cable,
      B = Hard disk control cable (use the LAST connector)



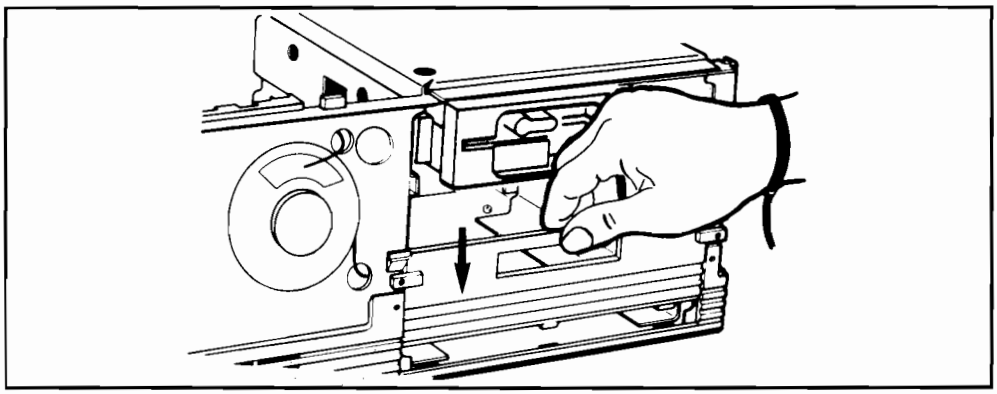
b. Plug the other end of the control cable into the AT Multifunction Controller Card (slot 7).



8. **Slide the disk drives firmly into place.**



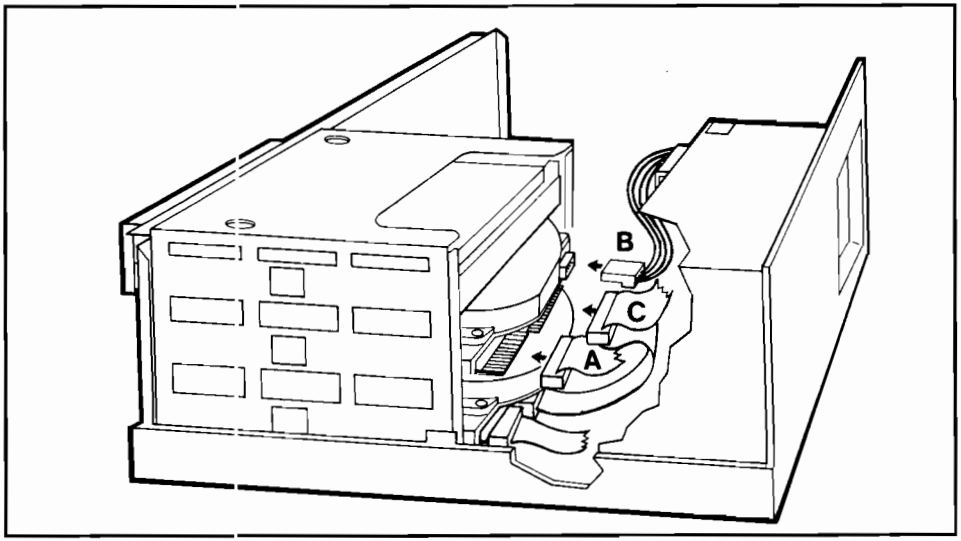
9. **Reinstall the hard disk drive blank panel.**



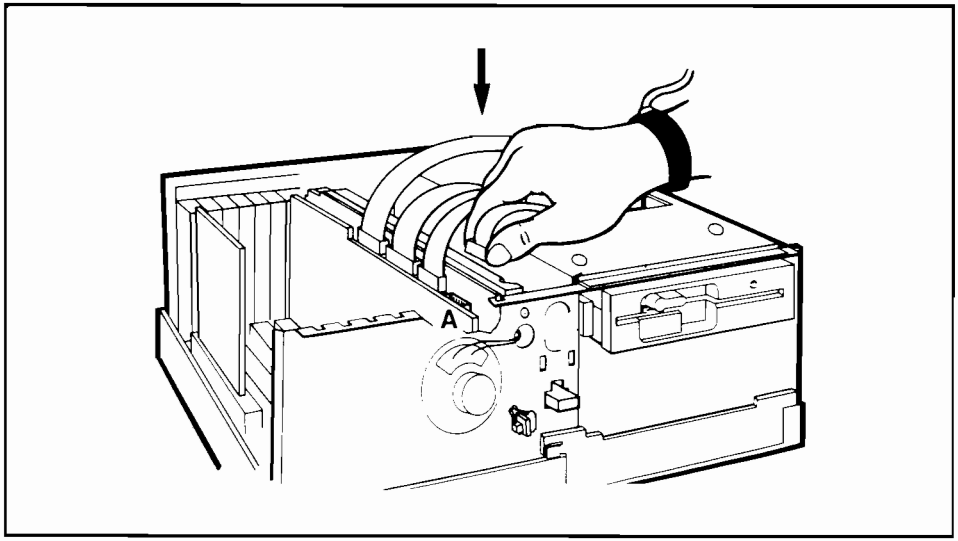
Installing a Second Hard Disk Drive

Follow the same procedure as for the first hard disk drive, except:

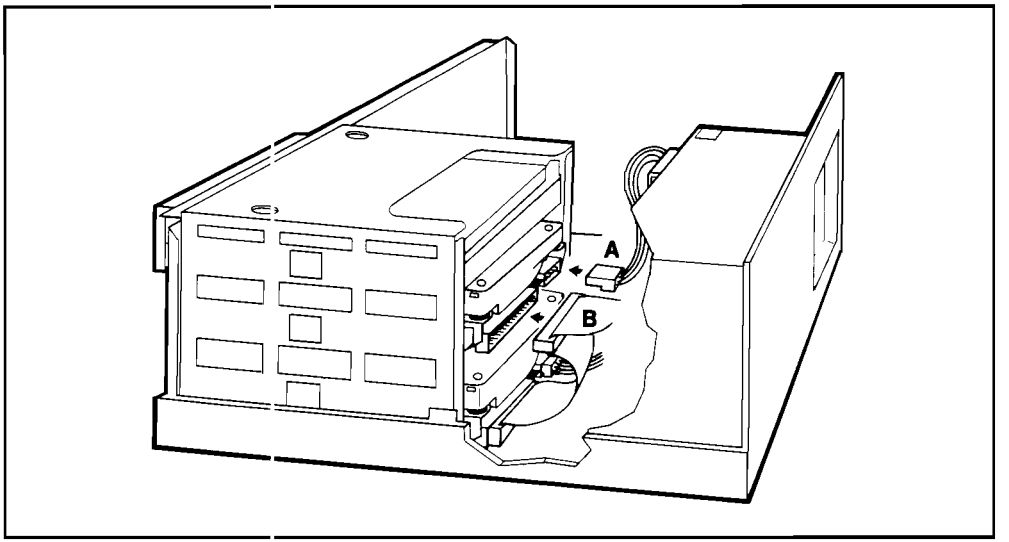
1. **Install the second drive in the middle shelf.**
2. **For an ST-506 or ESDI drive:**
   a. Plug the data cable (supplied with the disk), control cable and power cable into the drive.
   A = Second hard disk data cable, B = Power cable,
   C = Hard disk control cable (use the MIDDLE connector)



b. Plug the other end of the data cable into the ST-506 or ESDI controller card (A) in slot 7.



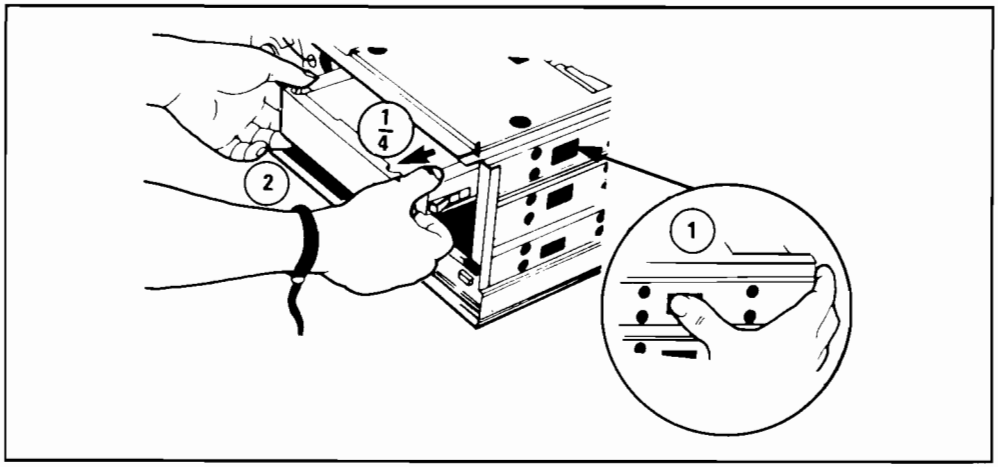
3. **For an embedded-AT controller drive:** Plug in the control cable and power cable.
   A = Power cable
   B = Hard disk control cable (use the MIDDLE connector)



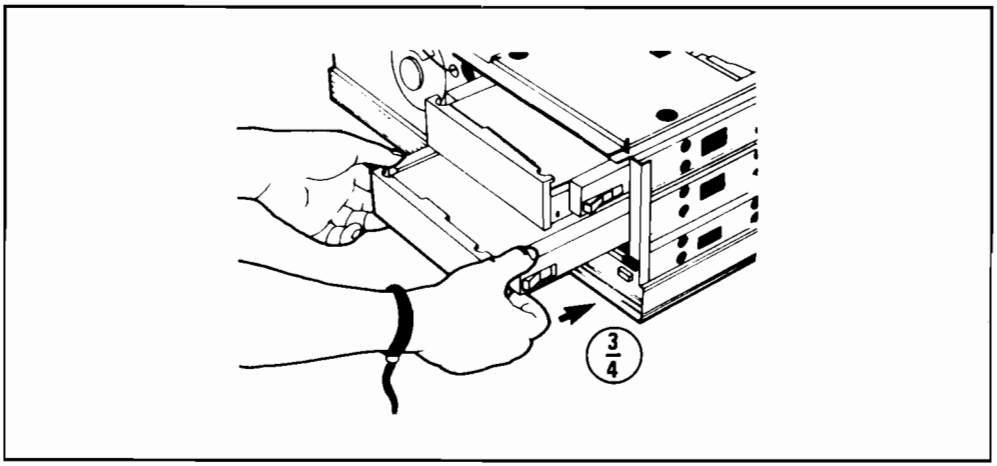
Read the next section to install a flexible disk.
Then read Where to Go Next at the end of this chapter.

Installing a Second Flexible Disk Drive

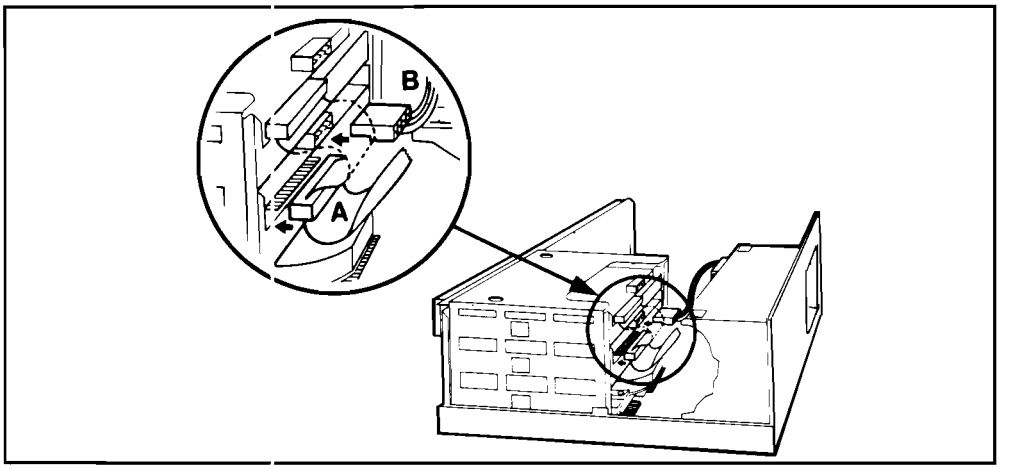
1. Slide the first flexible disk $^1/_4$ of the way out of the top shelf.



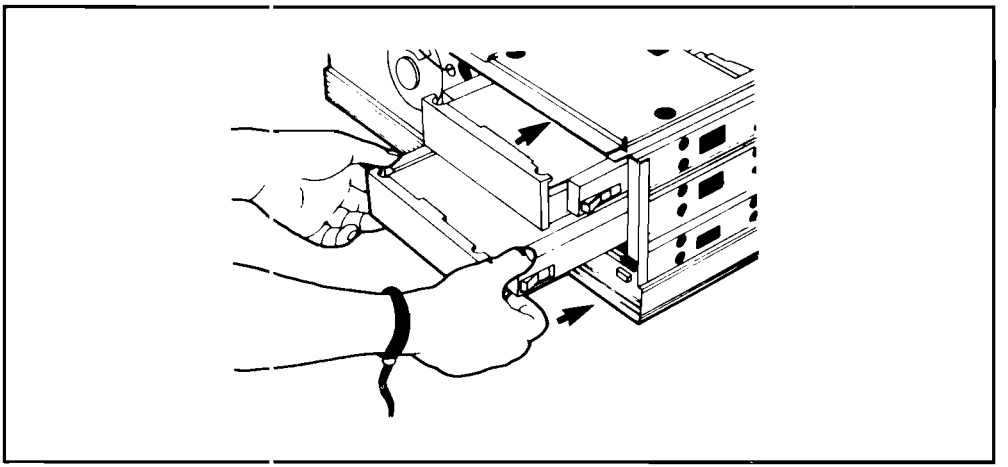
2. Slide the second flexible disk drive $^3/_4$ of the way into the middle shelf.



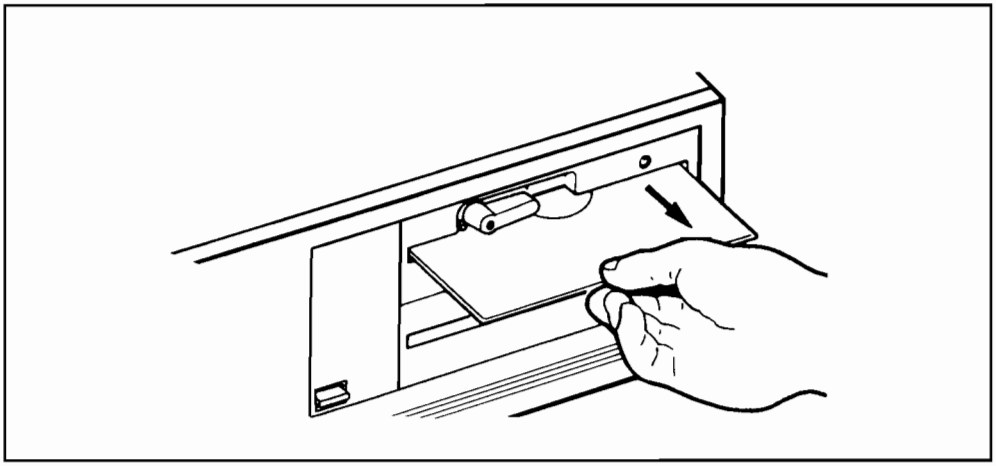
3. **Plug in the data (20-pin) and power cables into the drive.**
   A = Flexible disk control cable (use the MIDDLE connector),
   B = Power cable



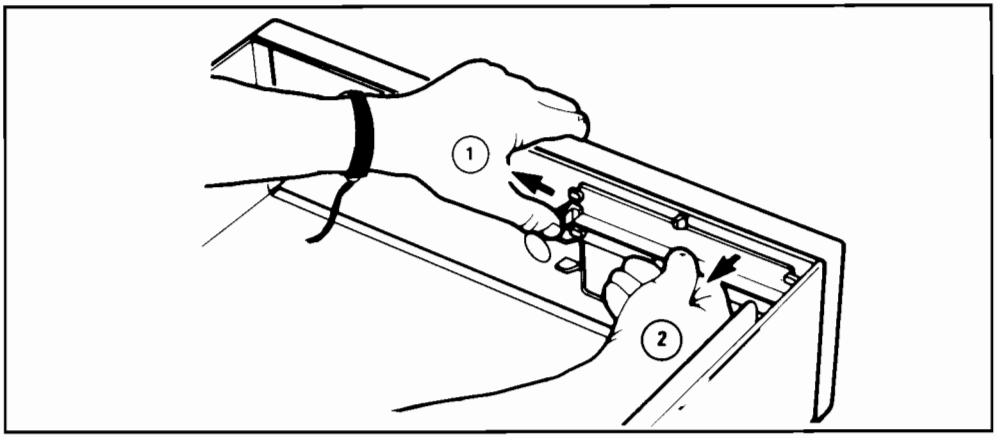
4. **Slide the disk drives firmly into place.**



5. **Remove the shipping insert from a 5.25-inch flexible disk drive.**



6. **Remove the blank panel from the disk slot in the cover.** Turn the computer cover upside down. Unclip the locking tab, and lift the panel off.



Where to Go Next

If you have finished installing options/accessories, replace the cover as described in Chapter 2. Then connect the keyboard and display as described in Chapter 1.

8

Configuring Your Computer

You use the SETUP program to give your computer information about items that have been installed, and how those items are configured.

Run the SETUP program when you start your computer for the first time. You must also run the SETUP program when you install anything new in your computer (such as drives, memory, or a video adapter).

The First Time You Use Your Computer

Complete these steps if this is the *first* time you are turning on your computer.

1. Make sure your computer and display are plugged in, but turned off.
2. Turn on the display.
3. *Without* inserting any disks, turn on the computer.

The computer performs its self test and memory count. It will beep once if it is set to its slow speed, and twice if it is set to its fast speed.

If this message appears:

"`Invalid configuration information - Run SETUP program Strike F1 to continue`" or "`Insert system disk in drive and press any key to continue`"

- Run option 1 (Set System Configuration) of the SETUP program.
- Run option 4 (Initialize Internal Hard Disk) if this is the first time you are starting your computer AND you have an ST-506 hard disk drive.

Running the SETUP Program

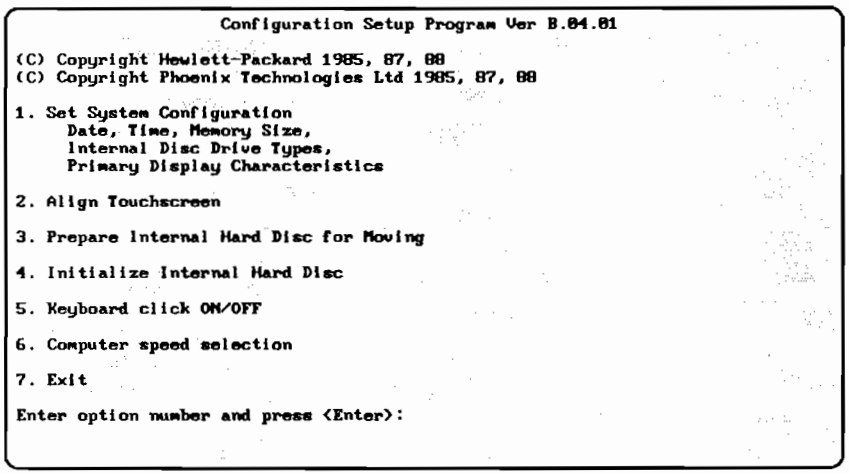
1. Insert the SETUP AND UTILITIES DISK in drive A.
2. Restart your computer by holding down Ctrl and Alt and pressing Del.
3. If you are prompted to select the language type of your keyboard, do so.

   If you are prompted to enter a file name of a previously saved configuration file and you have one you wish to use, do so.

   The SETUP main menu will then appear.
4. Select the option that you need to run by typing the number of the option and pressing Enter.

   (Pressing any key will automatically put you in option 1 if you received the message "`Invalid configuration information - Run SETUP program Strike F1 to continue`".)

   All options are documented on the screen. If you need more information on any option, refer to the next section, "SETUP Program Options."



SETUP Program Options

The six SETUP program options are described below. Some options documented here may not be displayed on your screen - these options cannot be used with your computer model.

1. Set System Configuration

You *must* run the Set System Configuration option when:

- You start your computer the first time.
- You add new options or accessories, such as an accessory card, a drive, or additional memory.
- You change the battery pack.
- You wish to change the time or date.

When you run option 1, you will be prompted to answer questions with a Y (Yes) or N (No). Each screen is self-documenting.

Hard Disk Drive Type

The *Set System Configuration* screen includes **Hard Disk C: and D:** fields for the type of hard disk - a number between 1 and 47. The correct hard disk drive type is printed on the hard disk drive. You can also find the hard disk drive type for *factory-installed* hard disk drives in Appendix B.

The Hard Disk Drive Type *is not* the number of megabytes on the hard disk. If you give an incorrect hard disk drive type, the drive will not work properly.

For example, a 42 MB hard disk drive is type 37, and an 84 MB hard disk drive is type 38.

The hard disk type depends on the ROM BIOS of your computer.

The ROM BIOS number appears when you start your computer (or press Ctrl Alt Del). To halt the display to read the number, press Pause. Press any key to continue.

The table below shows the characteristics for hard disk drives on:

- the HP Vectra QS/16S with BIOS ROM version F.02.03 or higher.
- the HP Vectra QS/20 with BIOS ROM version D.02.03 or higher.

Hard Disk Characteristics (QS/16S: F.02.03, QS/20: D.02.03)

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
1	966	9	-1	966	151 MB
2	615	4	300	615	20 MB
3	615	6	300	615	32 MB
4	940	8	512	940	64 MB
5	940	6	512	940	48 MB
6	615	4	none	615	20 MB
7	462	8	256	511	32 MB
8	733	5	none	733	30 MB
9	900	15	none	901	116 MB
10	820	3	none	820	20 MB
11	855	5	none	855	36 MB
12	855	7	none	855	52 MB
13	306	8	128	319	20 MB
14	733	7	none	733	44 MB
16	612	4	0	663	20 MB
17	977	5	300	977	40 MB
18	977	7	none	977	58 MB
19	1024	7	512	1023	62 MB

Hard Disk Characteristics (QS/16S: F.02.03, QS/20: D.02.03) (continued)

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
20	1775	7	-1	1780	330 MB
21	1630	8	-1	1630	360 MB
22	733	5	300	733	30 MB
23	1222	15	-1	1222	319 MB
24	1024	5	-1	1024	44 MB
25	1024	8	-1	1024	71 MB
26	1024	9	-1	1024	80 MB
27	646	16	-1	646	333 MB
28	1023	16	-1	1023	528 MB
29	271	16	-1	271	139 MB
30	1294	16	-1	1294	667 MB
31	732	7	300	732	42 MB
32	1240	7	-1	1240	151 MB
35	611	16	-1	611	315 MB
36	1631	15	-1	1631	651 MB
37	965	5	-1	964	42 MB
38	965	10	-1	964	84 MB
39	511	10	none	511	88 MB
40	624	10	none	624	108 MB
41	624	14	none	624	152 MB
42	1023	15	-1	1023	267 MB
43	805	4	-1	805	42 MB
44	820	6	none	820	40 MB
45	791	8	none	791	103 MB
46	791	12	none	791	155 MB
47	791	16	none	791	310 MB

The table below shows the characteristics for hard disk drives on:

- the HP Vectra QS/16S with BIOS ROM version F.02.02 or lower.
- the HP Vectra QS/20 with BIOS ROM version D.02.02 or lower.

Hard Disk Characteristics (QS/16S: F.02.02, QS/20: D.02.02)

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
1	306	4	128	305	10 MB
2	615	4	300	615	20 MB
3	615	6	300	615	32 MB
4	940	8	512	940	64 MB
5	940	6	512	940	48 MB
6	615	4	none	615	20 MB
7	462	8	256	511	32 MB
8	733	5	none	733	30 MB
9	900	15	none	901	116 MB
10	820	3	none	820	20 MB
11	855	5	none	855	36 MB
12	855	7	none	855	52 MB
13	306	8	128	319	20 MB
14	733	7	none	733	44 MB
16	612	4	0	663	20 MB
17	977	5	300	977	40 MB
18	977	7	none	977	58 MB
19	1024	7	512	1023	62 MB
20	733	5	300	732	30 MB
21	733	7	300	732	44 MB
22	733	5	300	733	30 MB
23	306	4	0	336	10 MB
24	612	4	305	663	20 MB
25	306	4	none	340	10 MB
26	612	4	none	670	20 MB
27	698	7	300	732	40 MB
28	976	5	488	977	40 MB
29	306	4	0	340	10 MB

Hard Disk Characteristics (QS/16S: F.02.02, QS/20: D.02.02) (continued)

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
30	611	4	306	633	20 MB
31	732	7	300	732	42 MB
32	1023	5	none	1023	42 MB
39	511	10	none	511	88 MB
40	624	10	none	624	108 MB
41	624	14	none	624	152 MB
42	791	15	none	791	103 MB
43	1023	16	none	1023	142 MB
44	820	6	none	820	40 MB
45	791	8	none	791	103 MB
46	791	12	none	791	155 MB
47	791	16	none	791	310 MB

Memory

The *Set System Configuration* screen includes fields for memory. The three kinds of memory are: **system base memory (or base memory), reserved memory,** and **extended memory.**

System base memory is the memory located from 0 KB to 640 KB. It is used by your computer's operating system (MS-DOS or other) and by application programs.

HP Vectra computers are typically shipped with 640 KB of system base memory.

Note

You can specify 512 KB system base memory to allow some specialized applications to run on your HP Vectra computer, even though it actually has 640 KB of system base memory.

Reserved memory is the memory located from 640 KB to 1 MB. It is used by applications to control video and disk operations, and by the BIOS and option ROMs.

Extended memory is memory located in the memory space above 1 MB. If you have extended memory, you *must* enter the total amount of extended memory in KB on the SETUP screen.

2. Align Touchscreen

This option aligns your display with HP Touch. HP Touch is an accessory that allows you to touch the screen to select certain functions or move the cursor.

3. Prepare Hard Disk for Moving

If you have a Hewlett-Packard 20 MB hard disk drive, you must use this option to park the hard disk drive heads before moving your computer. Using this option to park the drive heads protects the data on your hard disk when your computer is jostled. You should also use this option before removing a 20 MB hard disk drive from your computer.

For all other HP hard disk drives (40 MB and larger), the disk drive heads park automatically when you turn the computer off.

4. Initialize Internal Hard Disk

Initialization prepares a hard disk drive to receive data.

Hewlett-Packard high capacity hard disk drives greater than 40 MB *do not* need to be initialized using this option; they are fully initialized at the factory.

An ST-506 hard disk drive only must be initialized the first time you turn on your computer. You must also initialize any new ST-506 hard disk drive that you later add to your computer.

Hard disk drive initialization could take up to 1 minute per megabyte.

If your hard disk initialization fails, you will see the following error message:

```
Initialization of disk failed. Error returned=>
```

Check the following before attempting to rerun this option:

- Select the SETUP program option 1 (Set System Configuration) and make sure that the hard disk drive is properly configured. Verify that the Hard Disk Drive Type is correct.
- Verify that all data and power cables are correctly connected.

After you initialize a hard disk drive, you can install your operating system on it. If you are adding a second hard disk drive to your computer, you must format it before you can use it.

5. Keyboard Click ON/OFF

The Keyboard Click ON/OFF option turns the keyboard click (the sound that occurs when you press a key) ON and OFF.

When the keyboard click is ON, you can hear the keys as you type. When it is OFF, the keys are silent. Your computer comes pre-set with the keyboard click ON.

6. Computer Speed Selection

This option changes the speed at which your computer operates. Computers that can operate at multiple speeds come pre-set from the factory to run at the fastest speed possible. However, you may want to run the computer at a slower speed, when:

- You are using copy-protected software that needs to run at a slower speed initially.
- You are using software that needs to run at a slower speed all the time (for example, some games and communication software).

It is recommended that you use the pre-set speed. (The pre-set speed is displayed when you select this option.)

To use software that needs to run at a slower speed, use the HPMODE command. Refer to chapter 9, "Installing and Using the HP Utilities," for information about the HPMODE command.

Alternatively use the Ctrl Alt \ key sequence to change the speed. Refer to chapter 11, "Controlling Computer Functions," for information about the Ctrl Alt \ key sequence, and the keystrokes to use with non-US keyboards.

SETUP Program Command Line Options

The SETUP program has 15 command line options which are designed for use by service personnel or advanced users. The command line options are listed below. You can also type `/H` at the prompt on the SETUP main menu for a list of the command line options.

Command Line Option Descriptions

The following is a description of each SETUP command line option. It is important that you understand each option before using it.

/BAK **Make work disk of SETUP master disk.** This option creates a SETUP work disk from the SETUP AND UTILITIES DISK. If your SETUP work disk is ever damaged you will still be able to use the SETUP AND UTILITIES DISK.

/C **Specify drive characteristics for unknown hard disk drive type.** This option saves the characteristics of a hard disk drive that does not have a hard disk drive type listed in the Hard Disk Characteristics table in this chapter. This command line option alters the way option 4 (Initialize Internal Hard Disk) runs.

/D **Manually mark hard disk defects.** This option allows you to manually enter hard disk defects. You *must* have a list of defects from the factory to do this. A list of known defects is usually supplied with a hard disk purchased directly from the factory.

Known hard disk defects have already been marked on disks purchased from Hewlett-Packard. (These drives must be supported for use with the HP Vectra or factory-installed in the HP Vectra.) If, for some reason, you believe that this information may have been erased from the disk, you may use this option to re-mark all defects found at the factory.

This option changes the way option 4 (Initialize Internal Hard Disk) runs. You will be prompted for the cylinders and heads that contain defects. When you have entered eight cylinders and heads, you will be asked if you want to enter more. If you enter any defects incorrectly, you may change them.

The /D option runs one media scan, initializes the disk, and then runs a surface analysis. If you also use the /F (fast initialization) option, no media scan or surface analysis are done during the initialization and *only* the manually entered defects will be marked. (See the /F description.)

/E **Reinitialize drive types 40, 41, 42, 43, 45, 46, 47.** This option reinitializes Hewlett-Packard ESDI drive types 40, 41, 42, 43, 45, 46 and 47. These drives come pre-initialized from Hewlett-Packard and, under normal circumstances, there is no need to reinitialize them. But if you *must* reinitialize one of these drives, use this option. This option changes the way option 4 (Initialize Internal Hard Disk) runs.

/F **Fast initialization.** This option performs an initialization only: The media scan and surface analysis operations are eliminated. This option *does not* mark defects on a hard disk; therefore, use of this option is *not recommended.* If you choose to use this option with the /D option *no* media scan or surface analysis of the hard disk will take place. No defects other than those you have entered with the /D option will be marked. This option changes the way option 4 (Initialize Internal Hard Disk) runs.

/H **Display all available options.** This option displays all SETUP command line options available for use with your computer.

/I **Set hard disk interleave factor.** The interleave value determines the way the sectors are numbered on a track. You should only change this value if you have been instructed to do so by the hard disk drive installation manual or you understand the reasons for doing so. This option changes the way option 4 (Initialize Internal Hard Disk) runs.

/K*n* **Specify MS-DOS keyboard language driver.** This option allows computers that support the various language keyboards (English, French, Spanish, etc.) to use the SETUP program. With this option, select your language keyboard first, then run the SETUP program. Enter `/K0` ("0" is zero) at the prompt on the SETUP main menu to get a list of supported languages.

/M **Switch SETUP screens to monochrome.** The screens of the SETUP program are designed to be displayed on either color or monochrome displays. If you have a monochrome (single color) display, and the SETUP program screens look as if they are missing text, use this command line option to display screens as text only.

/P **Park hard disk drive heads.** This option parks hard disk drive heads. You can use this command line option in place of option 3 (Prepare Internal Hard Disk for Moving). Once run, turn off the computer immediately.

/R **Restore system configuration from a file to non-volatile RAM (CMOS).** This option restores your system configuration by copying the saved configuration from a file to the non-volatile RAM (CMOS).

/S **Make SETUP program the shell.** This option is a standard part of the CONFIG SYS file on the SETUP AND UTILITIES DISK. It resets the computer when the SETUP program is exited so that the operating system (MS-DOS or other) can then be loaded.

/SA **Save system configuration from non-volatile RAM (CMOS) to a file.** This option saves your SETUP configuration by saving the current non-volatile RAM (CMOS) image to a file.

/X **Scan hard disk drive and list all marked defects.** This option confirms that any defects found on the disk at the factory have been properly marked so that no data is written to them. To use this option, you must remove the cover of your computer and copy the list of cylinder and head defects found taped to the top of your hard disk drive.

Using the Command Line Options

You can enter the command line options at the MS-DOS prompt or at the prompt on the SETUP main menu.

To enter command line options at the MS-DOS prompt, enter

SETUP *options*

where *options* represents one or more of the command line options. Separate command line options with a blank space. For example:

SETUP /M /D /F

To enter command line options at the prompt on the SETUP program main menu, enter *only* the command line options. Separate command line options with a blank space. For example:

```
Enter option number and press <Enter>: /M /D /F
```

Where to Go Next

When you have finished configuring your computer, connect your printer, plotter or mouse as described in chapter 1. Then install the operating system as described in your MS-DOS manuals. After installing MS-DOS, install the MS-DOS utilities as described in Chapter 9.

9

Installing and Using the HP Utilities

NOTE: These utilities are for MS-DOS users only.

This chapter explains how to install the HP Utilities:

- HPMODE,
- HP-HIL Pointing Device Driver,
- the Video Graphics Adapter (VGA) Utilities, & DRIVERS
- and HP Extended Memory Manager Program/386.

The instructions in this chapter assume that you have your MS-DOS system files on your hard disk. If you use MS-DOS on a flexible disk, you should copy the utilities to that disk.

Preliminary Steps

Before you begin installing the HP Utilities you need to do several things:

1. Make a backup copy onto a flexible disk of your CONFIG.SYS file and AUTOEXEC.BAT file. (See your MS-DOS documentation for information about making backup copies.) This is to protect your files during the installation process.
2. Read the latest information about the HP Utilities by inserting the SETUP AND UTILITIES DISK in drive A and entering at the MS-DOS prompt:

   `TYPE A:\READ.ME | MORE` Enter

   (Press Enter to "page through" the information on your screen.)

3. **Copy the utilities to your hard disk** as follows:

   a. Make a directory for the Vectra utilities by typing:

      ```
      MD C:\UTILITY Enter
      ```

   b. Copy the utilities to the UTILITY directory by inserting the SETUP AND UTILITIES DISK in drive A and typing:

      ```
      XCOPY A:\*.* C:\UTILITY Enter
      ```

HPMODE Command

The HPMODE Command is an HP Utility that allows you to temporarily change the processing speed of your computer.

If you copied the SETUP AND UTILITY DISK to the UTILITY directory as described in "Preliminary Steps", you automatically installed HPMODE.

See Chapter 11, "Controlling Computer Functions", for more information about changing processing speed and for HPMODE Command syntax.

Insert VGA UTILITIES
Type A:
Type UNPACK <enter>
& follow instructions

The HP-HIL Mouse and Pointing Device Driver

The Hewlett-Packard Human Interface Link (HP-HIL) is the Hewlett-Packard standard interface for linking HP-HIL pointing devices (such as an HP Mouse or HP Graphics Tablet) with your personal computer. The HP-HIL driver controls the HP-HIL interface and allows an HP-HIL device to communicate with software applications.

Note

If you want to set the HP-HIL driver so that it *does not* load automatically, skip the following procedures. If you copied the SETUP AND UTILITY DISK to the UTILITY directory, no further installation steps are necessary.
However, each time you want to use an HP-HIL pointing device, you must enter at the MS-DOS

```
C:\UTILITY\MOUSE (Enter)
```

If you want the HP-HIL driver to load automatically when you start the computer, read the next steps.

Preliminary Steps to Automatically Load the HP-HIL Driver

Verify that your CONFIG.SYS file *does not* have a line containing the file MOUSE.SYS. At the MS-DOS prompt type:

```
TYPE C:\CONFIG.SYS (Enter)
```

If CONFIG.SYS *does* contain a MOUSE.SYS line, remove the line from the file using a word processor before proceeding to the next steps.

Automatically Installing the HP-HIL Driver with the INSTALL Program

To run the INSTALL program, you need a personal computer with two flexible disk drives, or at least one hard disk drive and one flexible disk drive.

1. Start your computer. Make sure the MS-DOS prompt or PAM (Personal Application Manager) appears on your screen. If you are in PAM, select: DOS COMMANDS and press (Enter)

2. Start the automatic installation program by typing

   `C:\UTILITY\INSTALL` Enter

3. Follow the instructions on your screen.

4. Restart your computer by pressing Ctrl, Alt and Del simultaneously.

You have successfully installed your HP-HIL driver and are now ready to use HP-HIL devices with your computer.

Manually Installing the HP-HIL Driver

There are two ways to manually install the HP-HIL driver:

1. using the CONFIG.SYS file if you want to permanently load the mouse driver.
2. using the AUTOEXEC.BAT file if you want to be able to load and unload the mouse driver.

Installing the HP-HIL Driver Using CONFIG.SYS

1. Add this line to your `CONFIG.SYS` file using a word processor

   ```
   DEVICE=C:\UTILITY\MOUSE.SYS
   ```

2. Restart your computer by pressing CTRL Alt and DEL simultaneously.

You have successfully installed your HP-HIL driver and are now ready to use HP-HIL devices with your computer.

Installing the HP-HIL Driver Using AUTOEXEC.BAT

1. Add this line to your `AUTOEXEC.BAT` file using a word processor

   ```
   C:\UTILITY\MOUSE.COM
   ```

2. Restart your computer by pressing CTRL Alt and DEL simultaneously.

This loads the mouse driver.

If you want to remove the mouse driver from memory without restarting the computer, change to the UTILITY directory and type MOUSE OFF Enter at the MS-DOS prompt.

Video Graphics Adapter (VGA) Utilities

If you have an HP D1180A Video Graphics Adapter (VGA) installed in your computer, you may use the Video Graphics Adapter Utilities to:

- select a different video mode to accommodate an application that requires a video standard (mode) other than VGA, or
- install drivers for application programs that have an enhanced display mode exceeding the VGA standard, or
- use an alternate character font.

If you copied the SETUP AND UTILITY DISK to the UTILITY directory as described in "Preliminary Steps", you automatically installed the VGA Utilities.

You may use the VGA utilities to control your display as described below.

Selecting a Different Video Mode

If you find that an application does not run correctly, you may need to use the HPVGA.EXE program to tell your VGA card to emulate the type of card required by your application. You can select a different video mode through menu choices or by typing in commands at the MS-DOS prompt.

Note

The changes that you make will be in effect only until you restart or shut off the computer, or you select another video mode.

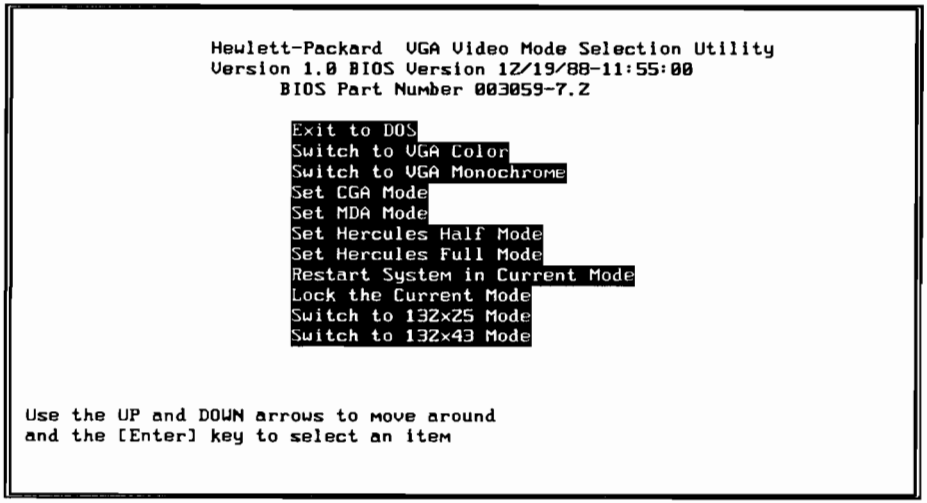
To "lock" your changes so they will not be lost when you shut off the computer, choose **Lock the Current Mode** from the Video Mode Selection menu.

Selecting a Different Video Mode from a Menu

1. Enter

   C:\UTILITY\HPVGA (Enter)

   The Video Mode Selection menu appears:



2. Select the video mode you want and press (Enter).
3. Choose Exit to DOS when you are finished making your changes.

Selecting a Different Video Mode from the MS-DOS Prompt.

Insert your VGA Utilities disk in drive A and enter

`A:HPVGA` *option* (Enter)

option can be any of the following choices:

Option	What it selects
VGA	VGA Color mode (default)
CGA	Non-VGA CGA mode
MDA	Non-VGA MDA mode
HERC0	Non-VGA Hercules half-page mode
HERC1	Non-VGA Hercules full-page mode
COLOR	VGA color mapping as needed
MONO	VGA monochrome mapping as needed
13225	132 x 25 text mode
13243	132 x 43 text mode
LOCK	Locks the current mode.
RESTART	Restarts the system in the current video mode.

Installing Drivers for Applications with Enhanced Video Modes

Your HP D1180A Video Graphics Adapter supports several video modes beyond the VGA standard. These enhanced modes allow the computer to display 132 columns of text and 800 x 600 dot resolution graphics on multi-frequency displays. If you have option 1A7 of the HP VGA, you can also use the 640 x 480 x 256-color graphics modes provided for some applications.

To use any of these enhanced modes, you must first install a software driver that was designed to support the particular program that you want to use. The VGA Utilities provide drivers for these programs:

- AutoCAD 2.18 or later
- Cadvance
- Microsoft Windows 1 03
- Word Perfect
- WordStar 3.3
- WordStar Professional 4

Note

In the following sections, it is assumed that you will provide the path to the application program you want to run when you execute the command (see your MS-DOS documentation for an explanation of paths).

It is also assumed that you are using color VGA mode. If you are not, use HPVGA.EXE to switch the video mode to VGA color. (See "Selecting Another Video Mode" for instructions.)

Installing the AutoCAD Drivers

800 x 600 Extended Resolution Graphics

1. Copy the driver file **DS800.EXE** to your flexible AutoCAD work disk or to the subdirectory (ACAD) on your hard disk that contains AutoCAD by entering

   ```
   COPY C:\UTILITY\DS800.EXE C:\ACAD Enter
   ```

2. Load the driver file by changing to the directory where you copied it, and entering **DS800**. (You will have to do this *every time* prior to running AutoCAD in 800 x 600 mode–or, you can put the command in a batch file.) This message appears when the driver is loaded:

   ```
   ---AutoCAD ADI Driver---
   VGA !!! 800 x 600 V1.00
   ```

3. Start AutoCAD and configure the video display for the "ADI display" driver. Accept the default, "7A", as the hexadecimal interrupt code.

4. When all configuration options are set correctly for your system, exit to the main menu and save your configuration changes.

5. Refer to your AutoCAD documentation for more information on configuring AutoCAD.

640 x 480 Extended Graphics Mode

1. Copy the driver file DS480.EXE to your flexible AutoCAD work disk or to the subdirectory (ACAD) on your hard disk that contains AutoCAD by entering

   ```
   COPY C:\UTILITY\DS480.EXE C:\ACAD Enter
   ```

2. Load the driver file by changing to the directory where you copied it, and entering DS480. (You will have to do this *everytime* prior to running AutoCAD in 640 x 480 mode–or, you can put the command in a batch file.) This message appears when the driver is loaded:

   ```
   ---AutoCAD ADI Driver---
   VGA !!! 640 x 480 V1.19
   ```

3. Start AutoCAD and configure the video display for the "ADI display" driver. Accept the default, "7A", as the hexadecimal interrupt code.

4. When all configuration options are set correctly for your system, exit to the main menu and save your configuration changes.

5. Refer to your AutoCAD documentation for more information on configuring AutoCAD.

Installing the Cadvance Drivers

Caution

The procedures in this section *change* your Cadvance program. Make sure you are using a *work copy* of your Cadvance disk, *not* the original program disk.

800 x 600 Graphics Mode

1. Replace the file named GS.DRV on your Cadvance disk (or in the directory where you keep Cadvance) with the file named GS800.DRV from the UTILITY directory on your hard disk. For example, if Cadvance is in a subdirectory named CAD on the C drive, you would enter:

   ```
   COPY C:\UTILITY\GS800.DRV C:\CAD\GS.DRV Enter
   ```

   When you start Cadvance, it will automatically be in 800 x 600 graphics mode.

640 x 480 x 16-Color Graphics Mode

1. Replace the file named `GS.DRV` on your Cadvance disk (or in the directory where you keep Cadvance) with the file named `GS480.DRV` from the UTILITY directory on your hard disk.

   For example, if Cadvance is in a subdirectory named CAD on the C drive, you would enter:

   ```
   COPY C:\UTILITY\GS480.DRV C:\CAD\GS.DRV (Enter)
   ```

   When you start Cadvance, it will automatically be in 640 x 480 x 16-color graphics mode.

Installing the Microsoft Windows 1.03 Driver

Before you install the Windows driver, you will first modify your Windows setup disks.

Caution

This procedure *changes* some files on your Windows setup disks and *erases* other files that are not needed. To avoid losing files that you may need for using MS-Windows with other video modes, *make new work copies* of your MS-Windows disks to use with the 640 x 480 mode.

---

1. Enter

   ```
   C:\UTILITY\WIN480 (Enter)
   ```

2. Follow the instructions on the screen as the computer changes your Windows setup disks to support the HP VGA in 640 x 480 graphics mode.
3. Insert the modified Windows Setup Disk (disk 1) in drive A and enter:

   ```
   A:SETUP (Enter)
   ```

4. Respond to the displayed Setup questions as described in your Windows documentation.

   When you start MS-Windows, it will automatically be in 640 x 480 x 16-color graphics mode.

Installing the WordPerfect Driver

The WordPerfect driver lets you use a 132-column text mode. (WordPerfect version 4.2 can use 132-column text modes without modifying the software.)

1. Enter the command for the mode you want to use. Select the mode you want from the following table:

For this mode:	Enter this command:
132 columns x 25 rows	C:\UTILITY\HPVGA 13225 (Enter)
132 columns x 43 rows	C:\UTILITY\HPVGA 13243 (Enter)
80 columns x 25 rows (standard)	C:\UTILITY\HPVGA VGA (Enter)

   These commands could also be used in a batch file.

2. Start WordPerfect using the `/S` parameter in order to specify the setup options.
3. Specify the screen options that describe your new configuration and save the changes.
4. Use the `HPVGA VGA` command to switch back to the standard 80-column x 25-line text mode.

Installing the WordStar 3.3 Driver

The WordStar 3.3 driver allows you to use a 132-column text mode. Before you install the driver, you will modify your work copy of the WordStar program.

Caution

These procedures create a modified version of your WordStar program. *Be sure* that you are using a work copy of your WordStar disk instead of the original program disk.

1. Copy the WS.COM file from your WordStar program disk to a flexible work disk or hard disk subdirectory. This copy will be your new, modified version of WordStar. Give this copy a different name, such as WS132.COM.

For example, if your old version of WordStar is on a flexible disk and you want to put the new version of WordStar in a directory called WORDSTAR on your hard disk, you might enter:

```
COPY A:\WS.COM C:\WORDSTAR\WS132.COM Enter
```

2. Copy the program DEBUG.COM from your MS-DOS system disk to your new WordStar work disk or subdirectory.
3. Copy the files MAKE.BAT, 43, 25, and HPVGA.EXE from the UTILITY directory to your new WordStar work disk or subdirectory. For example, you might enter

```
COPY C:\UTILITY\25 C:\WORDSTAR Enter
```

4. Change to the WordStar work disk or subdirectory and execute the MAKE batch file by entering:

```
MAKE nn filename Enter
```

Where *nn* is the number of rows of 132-column text you want to use (possible values are 43 or 25), and *filename* is the new name you selected for your modified WordStar program (for example, WS132.COM).

5. Confirm that you want to modify your WordStar disk when asked, and the MAKE batch file will change your new copy of WordStar.
6. Change to the UTILITY directory and enter the command for the mode you want to use (you must do this *before* you run your modified version of WordStar). Select the mode you want from the following table above.

For this mode:	Enter this command:
132 columns x 25 rows	HPVGA 13225 Enter
132 columns x 43 rows	HPVGA 13243 Enter
80 columns x 25 rows (standard)	HPVGA VGA Enter

7. Start your modified version of WordStar.
8. Use the `HPVGA.VGA` command to switch back to the standard 80-column by 25-line text mode.

Installing the WordStar Professional 4 Driver

The WordStar Professional 4 driver lets you use a 132-column text mode.

1. Use the WordStar WSCHANGE installation program to tell WordStar the screen size you will be using in number of rows and columns of text (either 132 x 25 or 132 x 43).
2. Change to the UTILITY directory and enter the command for the mode you want to use. (You must do this *before* you run WordStar.) Select the mode you want from the following table.

For this mode:	Enter this command:
132 columns x 25 rows	HPVGA 13225 (Enter)
132 columns x 43 rows	HPVGA 13243 (Enter)
80 columns x 25 rows (standard)	HPVGA VGA (Enter)

3. Use the `HPVGA.VGA` command to switch back to the standard 80-column by 25-line text mode.

Installing the Font Loading Utility

To override the default character fonts that your video card uses, select a non-default font using the FONTLOAD.COM program. The non-default font will stay resident in computer memory until you:

- turn off the computer,
- restart the computer by pressing (Ctrl) (Alt) and (Del), or
- load another font.

Fonts are displayed only in the video modes for which they are valid. For example, a CGA font can be used in VGA mode, but a VGA font cannot be used in a CGA mode.

1. Enter

   `C:\UTILITY\FONTLOAD` *filename* Enter

   where *filename* is one of the font filenames in the table below.

Non-Default Fonts You May Select

Video Mode	Font Filemane	Font
CGA	NOR8X8.FNT	Norsk/Dansk
EGA	NOR8X14.FNT	Norsk/Dansk
VGA	NOR8X16.FNT	Norsk/Dansk
CGA	IBM8X8.FNT	IBM-compatible
EGA	IBM8X14.FNT	IBM-compatible
VGA	IBM8X16.FNT	IBM-compatible

Use the command `FONTLOAD SYSTEM` to reactivate the last non-default font in use.

HP Expanded Memory Manager Program/386

Note

Install HPEMM/386 *before* you install the HP Vectra Disk Cache program that came packaged with your MS-DOS operating system. (Disk caching may need to use some of the memory created by HPEMM/386.)

HP Expanded Memory Manager/386 (HPEMM/386) is a utility that takes control of portions of *base, reserved,* and *extended* memory and converts them into *expanded* memory which is usable by MS-DOS applications.

If you copied the SETUP AND UTILITY DISK to the UTILITY directory as described in "Preliminary Steps", you automatically installed HPEMM/386.

If you want the HPEMM/386 to load automatically when you start the computer, read the next steps.

Preliminary Steps to Automatically Load HPEMM/386

Decide if you need to load HPEMM/386.

- **Load** HPEMM/386 if you are planning to use software written to Lotus-Intel-Microsoft Expanded Memory Specification (LIM EMS), version 4.0 or earlier. This includes Microsoft® Windows/286, release 2 of Lotus® 1-2-3®, dbase III®, and dBase III® Plus.
- **Do not load** HPEMM/386 if you:
  - Plan to use Microsoft® Windows/386 all the time. (Windows/386 includes the features of HPEMM/386.)
  - Use an operating system other than MS-DOS.

- To load HPEMM/386, add this line to your **CONFIG.SYS** file using a word processor.

  ```
  DEVICE=C:\UTILITY\HPEMM386.SYS
  ```

  Note that you can create a customized command line by adding parameters to the HPEMM386.SYS command. See "Customizing the HPEMM/386 Command Line".

  If you have other device drivers that use extended or expanded memory, you should place the command lines in this order in your **CONFIG.SYS** file:

  - HPEMM386.SYS device driver
  - VDISK.SYS or RAMDRIVE.SYS device drivers
  - other expanded memory device drivers

  Otherwise, the HPEMM386 command line can go anywhere in the CONFIG.SYS file.

- Restart your computer by pressing Ctrl Alt and Del simultaneously.

Customizing the HPEMM/386 Command Line

To modify the way HPEMM/386 functions, you must create a customized form of the HPEMM/386 command line and place the line in your CONFIG.SYS file using a word processor. Use the syntax and parameters described below to create a customized command line.

HPEMM/386 Command Line Syntax. Parameters that appear in brackets [ ] are optional. Variables that you fill in appear in *italics.*

DEVICE=[*drive:*] [*path*] HPEMM386.SYS [*size*] [*state*] [FRAME=*frame*] [W=*on*|*off*] [INCLUDE=*xxxx- yyyy*] [EXCLUDE=*zzzz-aaaa*] [EXT=*ext*] [DMA=*nnn*] [NOXRAM] [AMRS=*xx*] [LOWFRAME] [REBOOT] [NOHMA] [NOWARMBOOT] [NUMHANDLES=*nn*] [HMAMIN=*nn*]

Explanation of HPEMM/386 Command Line Parameters.

Parameter	What it Does
drive:	Refers to the drive where HPEMM/386 is installed. Default: If no drive is specified, the active drive is assumed.
path	Specifies the path from the root directory to the directory where HPEMM/386 is installed. Default: If no path is specified, the current directory is assumed.
size	Specifies, in kilobytes (KB), the amount of memory to convert into expanded memory. The size must be a multiple of 16KB and can range from 16KB to the total amount of memory available to HPEMM/386. If you specify a size that is greater than the amount of memory available, all available memory is converted. Memory available to HPEMM/386 equals the sum of all extended memory not being used by other programs plus a portion of reserved memory (to a maximum of 256 KB, depending on the accessory cards you've installed), minus about 90 KB to store the HPEMM386.SYS file. Specify a size only if you plan to install other programs (e.g. VDISK) in extended memory after HPEMM/386. In this case, to calculate the value for size, subtract the amount of extended memory you wish to leave for these programs from the amount of memory available to HPEMM/386. Default: If no size is specified, HPEMM/386 converts into expanded memory all memory available to HPEMM/386.

state

Specifies the on/off state of expanded memory as soon as CONFIG.SYS is executed. (In all cases, HPEMM/386 is loaded, but depending on the state you select, it might or might not convert any memory into expanded memory.) Options for state are AUTO, ON, and OFF.

- AUTO makes expanded memory available **only** when it is requested by an application. This is the recommended value.
- ON makes expanded memory available as soon as MS-DOS has executed the CONFIG.SYS file. If a LIM EMS application does not function properly with AUTO, use ON.
- OFF "turns off" expanded memory. Use OFF if you get an error message stating that your application is not compatible with expanded memory.

To change the state of HPEMM/386 during a work session, see "Turning On or Off Expanded Memory Temporarily".

Default: If no value is specified, the default value of AUTO is used.

FRAME=*frame*

Specifies the beginning address (in hexadecimal) of the 64 KB primary page frame. The beginning address must be a multiple of 16 KB (or 400 hex) and must fall between 768 and 896 KB (C000 and E000 hex). (This address is called the "page frame address".) See the table below for possible page frame addresses you can enter.

Do not specify a page frame address, but let HPEMM/386 choose the most appropriate value. If you find, however, that HPEMM/386 interferes with the operation of another I/O device (such as a network card, video card, or external disk drive card), you might want to specify a page frame address. From the table below, pick an address that is not being used by any I/O card; for example, C000. Then type **FRAME=C000** in your HPEMM/386 command line (or its shortened form **FRAME=C0**).

Default: If no FRAME parameter is specified, HPEMM/386 chooses the most appropriate page frame address for you, depending on the accessory cards installed in your system.

Various Page Frame Addresses You Can Use

Type:	Then Type a Page Frame Address (in Hex):
FRAME=	C000 or C0
	C400 or C4
	C800 or C8
	CC00 or CC
	D000 or D0
	D400 or D4
	D800 or D8
	DC00 or DC
	E000 or E0

W=*on*|*off*

Specifies whether support for the Weitek FPA is on or off. Use OFF for a Vectra QS.

Default: If nothing is specified, W=OFF.

Note

The values that you can use for INCLUDE and EXCLUDE depend on the optional hardware installed in your system. We strongly recommend that you do NOT specify INCLUDE or EXCLUDE values unless you are familiar with how your optional hardware and LIM EMS 4.0 operate.

INCLUDE=*xxxx-yyyy*
EXCLUDE=*zzzz-aaaa*

Specifies (in hexadecimal) portions of address space between 0 KB and 1 MB to add (INCLUDE) or subtract (EXCLUDE) from the default addresses to which HPEMM/386 maps pages of expanded memory. (The default addresses are 256 to 640 KB, or 4000 to A000 hex, as well as 64 KB of addresses starting at the FRAME address.) Each address used with INCLUDE or EXCLUDE must be a multiple of 16 KB (400 hex).

Suppose you want HPEMM/386 also to map expanded memory to addresses from 640 to 704 KB (A000 to B000 hex) and addresses from 800 to 832 KB (C800-D000) in addition to default addresses from 256 to 640 KB. You would type:

```
INCLUDE=A000-B000,C800-D000
```

Suppose you have a large number of installed drivers and do NOT want HPEMM/386 to map memory to addresses from 256 to 384 KB (4000 to 6000 hex). (You still want HPEMM/386 to map memory to addresses from 384 to 640 KB.) You would type:

```
EXCLUDE=4000-6000
```

Default: If INCLUDE and EXCLUDE parameters are not specified, HPEMM/386 maps expanded memory to addresses from 256 KB to 640 KB and to the 64 KB of addresses starting at the FRAME address (see the discussion on FRAME above).

Note

If you have an **HP 82328A Intelligent Graphics Controller Adapter** card or an HP ScanJet card installed, you must specify the card's address range using the EXCLUDE option. The address range for this card is typically CC00-D000. If you have configured the card to use a different address range, the value will be different. Refer to the documentation that comes with your graphics card for more information.

EXT=*ext*

Specifies, in kilobytes, the amount of extended memory to leave when HPEMM/386 is installed. The rest of available memory is converted to expanded memory. If you specify EXT, do not specify Size, and vice versa. Use the EXT parameter when you want to install other programs (e.g. VDISK) in extended memory after you install HPEMM/386.

Default: If no value is specified for EXT, HPEMM/386 converts into expanded memory
(1) all available memory except for the 64KB that XMS uses, OR
(2) the amount of memory you specified for Size.

DMA=*nnn*

Specifies the number of internal DMA (Direct Memory Access) buffers used by HPEMM/386. Each DMA buffer is 1 KB in size. The number of DMA buffers may be any number between 8 and 128.

When applications or drivers perform DMA, the data being transferred must first pass through buffers inside HPEMM/386. The number of DMA buffers must be large enough to accommodate the largest DMA request made by your application. However, allocating unneeded DMA buffers increases the amount of memory used by the HPEMM/386 program, thus reducing the amount of expanded memory that can be provided to

applications. In almost all cases, the default value provides sufficient DMA buffers.

You may wish to increase the number of DMA buffers if you suspect that HPEMM/386 is interfering with the operation of a peripheral controller card (such as a tape drive or flexible disk controller).

You may wish to decrease the number of DMA buffers if you need a little more expanded memory and doing so does not interfere with the operation of other devices in your system.

Default: If no DMA parameter is specified, 16 DMA buffers are allocated.

NOXRAM

This option will prevent HPEMM/386 from using reserved memory.

You may wish to use this option if you suspect that HPEMM/386's use of reserved memory is interfering with the operation of an accessory card. Using this option will result in less expanded memory being available for use by your application.

Default: If this option is not specified, HPEMM/386 will use as much reserved memory as possible.

AMRS=*xx*

Allocates Alternate Map Register Sets. These are useful to speed program switching under some environments, such as Windows. Each AMRS increases the memory used by HPEMM/386 by 4 KB. Possible *xx* values are 0 - 15, default is zero.

LOWFRAME

Allows the EMS page frame to appear in the base memory region (below 640 KB). Since this option consumes 64 KB of base memory, it should only be used if hardware cannot be reconfigured to allow a free 64 KB page in the memory address region above the base 640 KB.

NOHMA	Disallow High Memory Area usage (64K above 1MB).
NUMHANDLES=*nn*	Reset the number of XMS handles to *nn*. The default number is 32, the minimum is 2 and the maximum is 255.
HMAMIN=*nn*	Require that users of the High Memory Area request at least *nn* kilobytes of memory. The default is 0.
REBOOT	Causes HPEMM/386 to filter access to the circuitry which controls resets to the 80386 processor. This may be required to be compatible with software that resets the processor (such as your computer's SETUP program). You should specify this option if you are using Windows/286. However, use of this option increases the amount of processing associated with the keyboard. This may cause problems when high-speed communication occurs simultaneously with keyboard usage.
NOWARMBOOT	Reduces the amount of reserved memory used by HPEMM/386 by 4KB. This parameter **should not be specified** if you are installing an application that automatically reboots the computer at the end of the installation process. NOWARMBOOT does not allow HPEMM/386 to execute some necessary cleanup routines when the machine is rebooted by the application–this puts the computer into an unstable state.

Sample Command

```
DEVICE=C:\UTILITY\HPEMM386.SYS 8192 ON FRAME=C0 INCLUDE=A000-B000
```

This tells the computer:

1. Look on drive C: in the UTILITY subdirectory for the HPEMM/386 file.
2. Convert 8192 KB (8 MB) of reserved memory plus extended memory into expanded memory.
3. Expanded memory is turned ON when CONFIG.SYS is executed.
4. Set the page frame address to C0000 (768 KB).
5. In addition to mapping expanded memory to the default addresses from 256 to 640 KB, let HPEMM/386 map memory to addresses from 640 to 704 KB (A000 to B000 hex).

Finding Out How Much Expanded Memory You Have

When you turn on your computer, a message tells how much Total Memory, Base Memory, Reserved Memory, and Extended Memory you have. (Total Memory = Base + Reserved + Extended.) Since HPEMM/386 has not been loaded yet, this message does **not** include the amount of expanded memory.

A few seconds later, when CONFIG.SYS is executed (and HPEMM/386 is loaded), you get a revised memory message. (If you only have 1 MB Total Memory, the message is much shorter.)

The values for Base Memory, Reserved Memory, and Extended Memory should be unchanged from the previous message. The other lines in the message are explained below.

```
640K Base Memory
  xxxK Usable as Expanded Memory
384K Reserved Memory
  xxxK Previously Allocated
  xxxK Converted to Expanded Memory
xxxK Extended Memory
  xxxK Previously Allocated
  xxxK Converted to Expanded Memory
  xxxK Occupied by HPEMM386
  xxxK Available
yyyK Expanded Memory Available
```

Message Displayed After HPEMM/386 is Loaded

1. **Usable as Expanded Memory:** The amount of base memory under the control of HPEMM/386.
2. **Converted to Expanded Memory:** The amount of reserved memory under the control of HPEMM/386.
3. **Previously Allocated:** In the case of Reserved Memory, this is memory that cannot be used because other installed accessory cards are using it. In the case of Extended memory, this is the amount of extended memory being used by programs such as VDISK.
4. **Converted to Expanded Memory:** The amount of extended memory under the control of HPEMM/386.
5. **Occupied by HPEMM386:** The amount of extended memory used to store the HPEMM386.SYS file.
6. **Available:** The amount of extended memory not being used by HPEMM/386 or other programs. (This amount equals total extended memory minus the values listed in 3, 4, and 5.)
7. **Expanded Memory Available:** The total amount of reserved memory and extended memory under the control of HPEMM/386. (This amount equals the sum of the values listed in 2 and 4.) If you specified a size parameter in your CONFIG.SYS file, this amount also equals that value.

Note

The MS-DOS command CHKDSK only shows the amount of **base memory** you have (up to 640 KB). Do **not** use CHKDSK to find the amount of expanded extended memory.

Turning On or Off Expanded Memory Temporarily

To turn expanded memory on or off during the current work session, you can type a special command at the MS-DOS prompt. (This command runs the HPEMM386.COM program.) The command has this format:

HPEMM386 [*state*] (Enter)

(Remember that the options for *state* are AUTO, ON, and OFF.)

After you use this command, your new HPEMM/386 parameters are in effect for the rest of the work session (or until you use the command again). As soon as you restart your computer, however, the HPEMM/386 parameters set up in the CONFIG.SYS file are restored.

Here are some examples of how to use this command:

1. To find out the On/Off state of expanded memory is on or off, type

   ```
   HPEMM386 (Enter)
   ```

   You get a message that resembles one of these:

   ```
   HPEMM386  ON
   HPEMM386  AUTO
   ```

2. To change the On/Off state of expanded memory, type one of these:

   ```
   HPEMM386 AUTO
   HPEMM386 ON
   HPEMM386 OFF
   ```

   If you try to turn expanded memory off while you have a TSR (Terminate and Stay Resident) program in expanded memory (such as the HP Vectra Disk Cache Program), you will get an error message.

HPEMM/386 Error Messages

Converting all available memory,
but unable to supply all requested expanded memory

Explanation: You requested that HPEMM/386 take control of more memory than is currently available. Therefore, HPEMM/386 simply takes control of all extended memory that is available.

Expanded Memory in Use - Unable to turn OFF
Remove resident program using expanded memory

Explanation: You tried to turn off HPEMM/386 while you have a TSR (Terminate and Stay Resident) program in expanded memory. First remove the TSR program from expanded memory (see the instructions in your TSR program manual). Then you can turn off expanded memory.

Extended memory in use - Unable to turn ON or AUTO
Remove resident program using extended memory

Explanation: You installed HPEMM/386 with the OFF option in your CONFIG.SYS file, then installed a driver or Terminate-Stay- Resident (TSR) program which uses extended memory, and afterwards used HPEMM386.COM to change the state of HPEMM/386 to ON or AUTO. In this case, HPEMM/386 is unable to create expanded memory until the extended memory used by the TSR program is released. You must either remove the TSR program which is using extended memory or change CONFIG.SYS to install HPEMM386.SYS using the AUTO or ON option.

FRAME value overlaps accessory hardware
Specify a different FRAME value in CONFIG.SYS

Explanation: You specified a page frame address [FRAME] that is already being used by an accessory card. Change your CONFIG.SYS file in one of these two ways: (1) Remove the FRAME parameter from your command line and let HPEMM/386 choose the most appropriate value (the recommended

solution); OR (2) Specify a different value for FRAME, i.e. an address that is not being used by an accessory card.

```
HPEMM386 internal error #xx at address XXX:YYY
Press any key to restart your computer
```

Explanation: You have encountered an error in the HPEMM/386 software. Restart your computer. If the problem persists, contact your dealer or your HP representative.

```
HPEMM386 not found
Add "DEVICE=HPEMM386.SYS" to CONFIG.SYS and
ensure that HPEMM386.SYS is on your system disc
```

Explanation: You tried to run HPEMM386.COM without first installing HPEMM386.SYS. Make sure you have copied HPEMM386.SYS to your hard disk and have added the HPEMM/386 command line to your CONFIG.SYS file. (Use the command line `DEVICE=HPEMM386.SYS` or refer to "Preliminary Steps to Automatically Load HPEMM/386" for more information.)

This message may also appear if you run HPEMM386.COM with an old version of HPEMM386.SYS. Make sure you have copied the new version of HPEMM386.SYS on your hard disk, then rerun the HPEMM386.COM program.

```
HPEMM386 not installed
```

Explanation: You cannot install HPEMM/386. (This message is displayed with another message that explains why.)

```
HPEMM386 - Privileged Operation Detected
This application must run with HPEMM386 OFF
Deactivate HPEMM386 and (C)ontinue or (R)estart? (C/R)
```

Explanation: You tried to load a protected-mode application that is incompatible with HPEMM/386. You can do one of the following: (1) Type `C` to turn off HPEMM/386 and restart your application; or

(2) type R to restart your computer.
In the future, remember to type HPEMM386 OFF before you run this program. Then, when you finish running the program, type HPEMM386 AUTO or HPEMM386 ON.

HPEMM386 unable to access extended memory --
error code xx.

Explanation: HPEMM/386 found a hardware problem. Try one of the following: (1) Continue working without expanded memory; OR (2) Restart your computer; if the problem persists, check your hardware.

HPEMM386 unable to enter protected mode --
error code xx.

Explanation: HPEMM/386 found a hardware problem. Try one of the following: (1) Continue working without expanded memory; OR (2) Restart your computer; if the problem persists, check your hardware.

Incorrect version of HPEMM386.SYS installed
Ensure that HPEMM386 SYS and HPEMM386.COM
are the same version

Explanation: You tried to use HPEMM386.COM with an old version of HPEMM386.SYS. Install the new version of HPEMM386.SYS on your hard disk and restart your computer. Then type your HPEMM386 command again at the MS-DOS prompt.

Insufficient Extended Memory Available
Allocate Less Extended Memory to other programs

Explanation: You've already installed one or more programs (e.g. VDISK) that are using most of extended memory; and you have not left HPEMM/386 enough extended memory to convert to expanded memory.

To obtain expanded memory, change your CONFIG.SYS file so that your other programs use less extended memory. Then restart your computer.

```
Invalid Address specified
Must be a multiple of 16 KB
```

Explanation: In the HPEMM/386 command line in your CONFIG.SYS file, you specified an unacceptable value for FRAME, INCLUDE, or EXCLUDE. Edit your CONFIG.SYS file (using a word processor that creates unformatted files) so that the values for these three parameters are all multiples of 16 KB (or 400 hex).

```
Memory Size rounded
Must be a multiple of 16 KB
```

Explanation: In the HPEMM/386 command line in your CONFIG.SYS file, you specified a value for SIZE that is not a multiple of 16 KB. HPEMM/386 rounded down to the next lower size that is a multiple of 16, and converted that amount of memory to expanded memory.

```
No Page Frame Available
Reconfigure hardware to make a page frame available
```

Explanation: HPEMM/386 must have a 64 KB page frame between 768 and 960 KB. If you have installed several cards with option ROMs, they might be using all of these addresses. To remedy the situation, reconfigure your cards (e.g. move the jumpers to assign different addresses to the cards) so that 64 KB is free. For details, see the manuals that came with your cards.
If you cannot reconfigure your cards, you may use the [LOWFRAME] option (described in "Explanation of HPEMM/386 Command Line Parameters".)

```
Preceding EMS manager found
Remove it or set HPEMM386 size to zero
```

Explanation: You have put command lines to install two expanded memory managers in your CONFIG.SYS file. Either remove one of them, or specify a zero size parameter for HPEMM/386.

```
Size and EXT both specified
Use at most one of them
```

Explanation: In the HPEMM/386 command line in your CONFIG.SYS file, you specified values for both Size and EXT; you can use only one parameter or the other (see "Explanation of HPEMM/386 Command Line Parameters". Correct your CONFIG.SYS file.

```
Stack fault at memory address XXX:YYY
Restart your computer
```

Explanation: You have encountered an error in the LIM EMS or FPA software you are using with HPEMM/386. Restart your computer and then start that software again. If the problem persists, contact your dealer.

```
Unable to create expanded memory
```

Explanation: You have only 1 MB of total memory and several optional cards installed. Therefore, you don't have enough reserved memory for HPEMM/386 to convert to expanded memory.

```
Unrecognized Parameter in CONFIG.SYS
Modify CONFIG.SYS
```

Explanation: You made an error in the HPEMM/386 command line in your CONFIG.SYS file. Correct it using EDLIN or a word processor that creates unformatted files. For more information on parameters, refer to "Customizing the HPEMM/386 Command Line".

`Unrecognized Parameter on Command Line`
`Valid options are ON, OFF, AUTO, W=ON, W=OFF`

Explanation: You typed an incorrect form of the HPEMM386 command at the MS-DOS prompt. Try again; the format is `HPEMM386 [state]`. A Weitek FPA is not supported on the Vectra QS, so you cannot use `[W=ON|OFF]`.

`Virtual Machine already in use`
`Remove software using virtual machine`

Explanation: You might have put the HPEMM/386 command line in your CONFIG.SYS file twice. To check, enter `TYPE C:\CONFIG.SYS` at the MS-DOS prompt. To correct your CONFIG.SYS file, use a word processor that creates unformatted (ASCII) files.

`Weitek FPA not found`

Explanation: You specified W=ON in your CONFIG.SYS file or in the HPEMM386 command at the MS-DOS prompt; however, you do NOT have a Weitek FPA.

`Weitek FPA unavailable while OFF`

Explanation: You tried to turn on support for your Weitek FPA (W=ON) with HPEMM/386 in the OFF state. You must first set HPEMM/386 to AUTO or ON mode.

`Wrong Machine Type`
`Must run on an 80386`

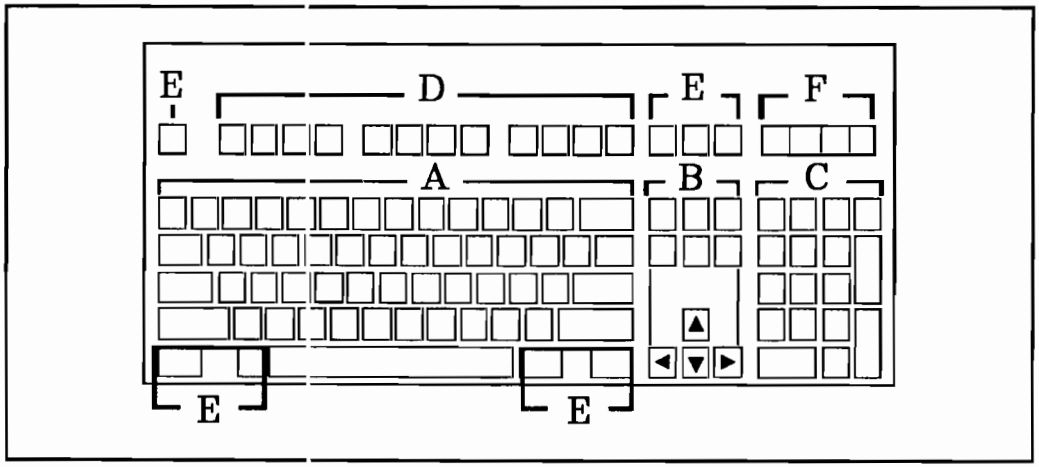
Explanation: You tried to install HPEMM/386 on the wrong kind of computer. You must install HPEMM/386 on a 80386-based computer.

10

Using the HP Vectra Enhanced Keyboard

The keys on the keyboard are arranged in the following groups, as shown in the figure below.

A. Typewriter keys
B. Cursor keys
C. Numeric keys
D. Function keys
E. Computer control keys
F. Indicator lights



Note

Since application programs can change the function of the keyboard, the information presented here may not hold true in all situations.

Typewriter Keys

Most of the keys on the typewriter keypad perform like standard typewriter keys. However there are some keys that are unique to computers. The keys that act differently than their corresponding keys on the standard typewriter are described in this section.

The Shift Key

By pressing the Shift key, you can type capital letters, symbols, and alternate punctuation marks. If Num Lock is ON, pressing the Shift key will allow you to use the numeric keypad as a cursor keypad. If Caps Lock is on, pressing a Shift key allows you to type lowercase letters. However, for certain countries, the Shift key turns off Caps Lock.

The Backspace Key

The Backspace key moves the cursor one space to the left, and usually erases any characters in the cursor's path.

The Tab Key

The Tab key moves the cursor from one tab marker to the next. If you use it in conjunction with the Shift key, the cursor moves back to the previous tab marker.

The Enter Key

The Enter key returns the cursor to the left side of the screen. Applications usually add a line feed instruction as well. Also, pressing the Enter key after you have entered data or instructions tells the computer to process them.

The Caps Lock Key

The Caps Lock key locks the alphabetic keys into capital letters until you press Caps Lock again. (For certain countries, you cancel Caps Lock by pressing Shift). If Caps Lock is ON, to use the numeric keys you must also press the Shift key. When Caps Lock is ON, an indicator light is on.

Computer Control Keys

You can combine many of the computer control keys in sequence to perform various computer functions. For more information on these key sequences, see the chapter, "Controlling Computer Functions." The normal function of each key is described below. However, applications can direct almost any key to perform a function.

The Ctrl Key

You use the Ctrl key in conjunction with other keys to perform certain computer functions. Typically, you hold down this key while pressing another key.

The Alt Key

U.S. keyboards have two Alt keys, non-U.S. keyboards have only one. You use this key much as you use the Ctrl key. However, the function of the Alt key differs with each application, so you need to refer to your application documentation for its current function.

The AltGr Key (found on non-U.S. keyboards only)

The AltGr key allows you to type the symbols that are found on the side (or vertical face) of some keycaps. Hold it down while pressing the key with the symbol you require.

Note that this key is not the same as the Alt key.

The Escape Key

Usually, the Esc key interrupts a function or process. You should, however, use this key as described in the manuals that come with the applications you are using.

The Print Screen/SysRq Key

The [Print Screen] key prints the contents of the screen on your printer. [Print Screen] works with a parallel printer. If you have some other kind of printer (serial or HP-IB), refer to the documentation for your operating system and application programs to find out how to print.

Some applications use the [SysRq] key to return to the operating system environment. Refer to the manual that comes with your application for the exact use of the [SysRq] key.

The Pause Key

The [Pause] key stops scrolling of data on the screen. Press [Ctrl] [Pause] to resume scrolling.

The Scroll Lock Key

Use of the [Scroll Lock] key depends on the application you are using. If you press [Scroll Lock], it remains on until you press the [Scroll Lock] key again. When [Scroll Lock] is on, an indicator light is on.

The Function Keys

The function keys are [F1] through [F12]. They are located in the top-most row of the keyboard.

The function keys may perform tasks which would otherwise require several keystrokes. Different applications assign different tasks to each set of function keys. The documentation that comes with the application tells you what tasks are assigned to the function keys.

The Cursor Keys

The cursor keys control the movement of the cursor on the screen. The arrows on the keys ▲ ▼ ◀ ▶ indicate the direction in which they move the cursor.

The Insert Key

The Insert key inserts characters into a line of text. To stop inserting characters, press the Insert key again.

The Delete Key

The Delete key erases the character on which the cursor is positioned. In addition, all characters to the right of the deleted character move one character to the left.

The Home Key and the End Key

In many applications, the Home and the End keys move the cursor to the upper left corner or lower right corner of the screen respectively. Some applications use these keys to move the cursor to the beginning or end of the current line.

The Page Up and Page Down Keys

The Page Up and Page Down keys move the cursor a set number of lines upward or downward.

The Numeric Keys

The numeric keys contain a calculator arrangement of numbers and symbols.

The Num Lock Key

Press this key to enter numbers using the numeric keypad. When [Num Lock] is ON, an indicator light is on. To return the numeric keypad to cursor control, press [Num Lock] again.

Note

Note that when you start your computer, the Num Lock indicator light is ON. To cancel [Num Lock], press the [Num Lock] key again.

The Enter Key

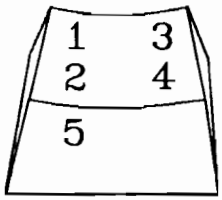
This key works like the [Enter] key of a calculator. Press [Enter] when you are finished with a calculation.

The Operation Keys

Use these keys to do your calculations. Press [/] for division, [*] for multiplication, [−] for subtraction, and [+] for addition. The [Page Up], [Page Down], [Insert] and [Delete] keys function exactly like the keys on the cursor keypad.

Special Keys on European Keyboards

Some keycaps on non-US keyboards can have up to five symbols on them. This section explains how to access these symbols. The following explanation refers to the illustration below.



Positions 1 and 2

These positions are common to most keyboards. To type the symbols at **position 1** you must hold down one of the Shift keys while pressing the key with the symbol you require.

To type the symbols at **position 2** you simply press the key with the symbol you require.

Positions 3 and 4

These positions are only used on the *Swiss/French keyboard.* To type the symbol at **position 3** you must hold down one of the Shift keys while pressing the key with the symbol you require.

To type the symbol at **position 4** you simply press the key with the symbol you require.

Position 5

This position is common to most European keyboards. To type symbols at **position 5** you must hold down the AltGr key while pressing the key with the symbol you require.

Keyboard Layouts

If you have remapped your keyboard using MS-DOS commands, refer to the following illustrations of the HP Vectra PC Enhanced Keyboard layouts:

U.S.

German

Spanish

French

Norwegian

Swiss French/Swiss German

Swedish/Finnish

U.K./English

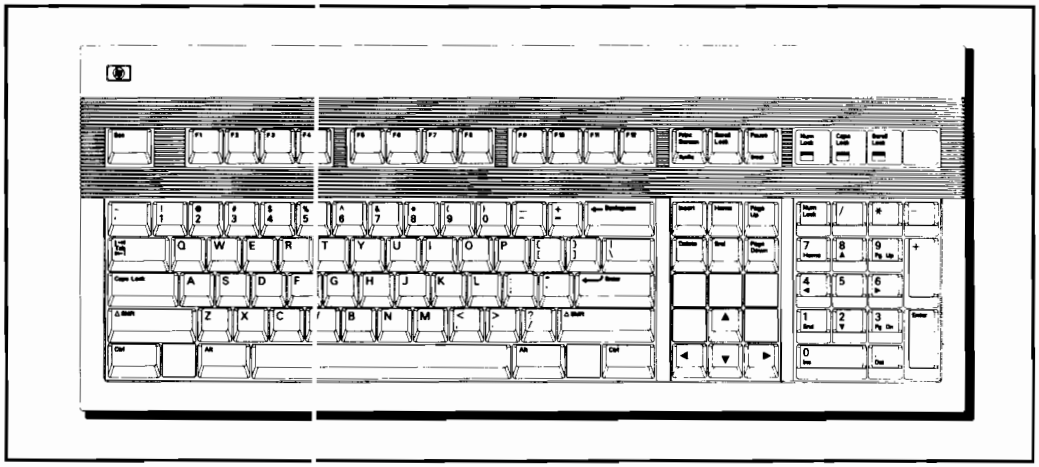
Danish

Italian

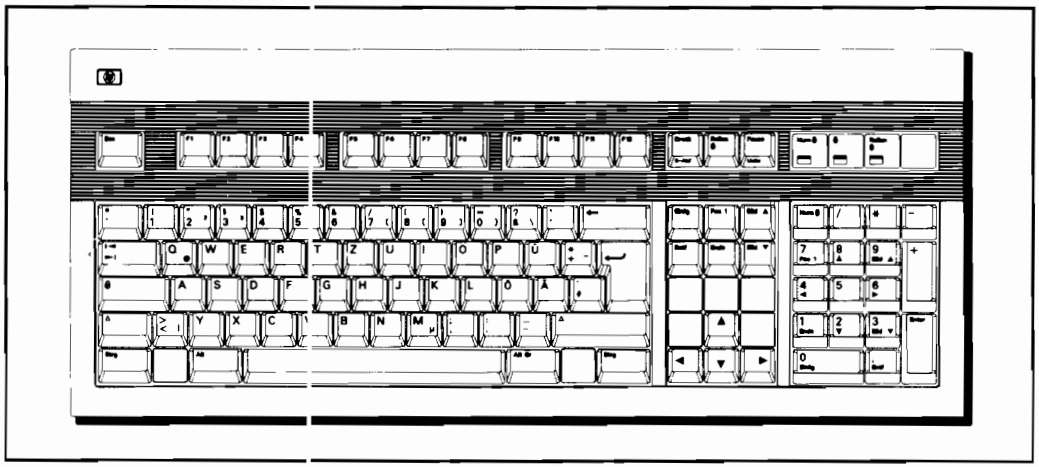
French Canadian

Belgian

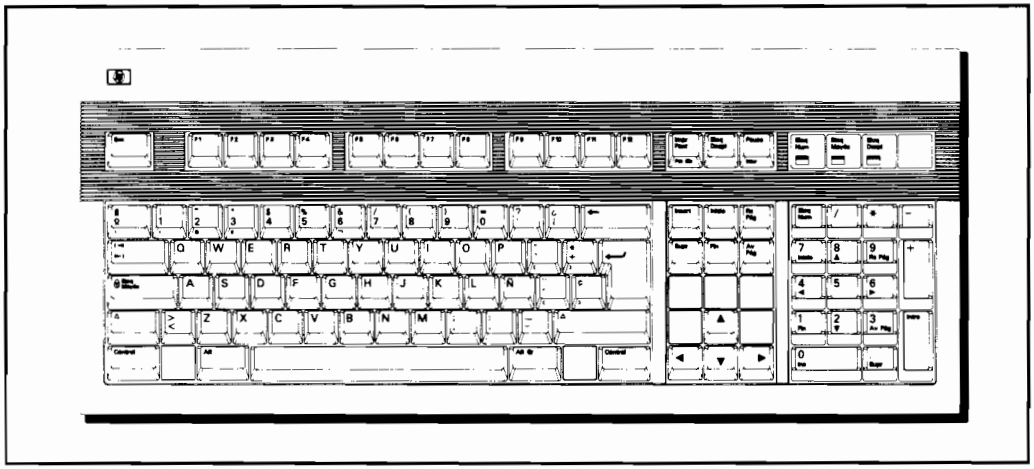
U.S.



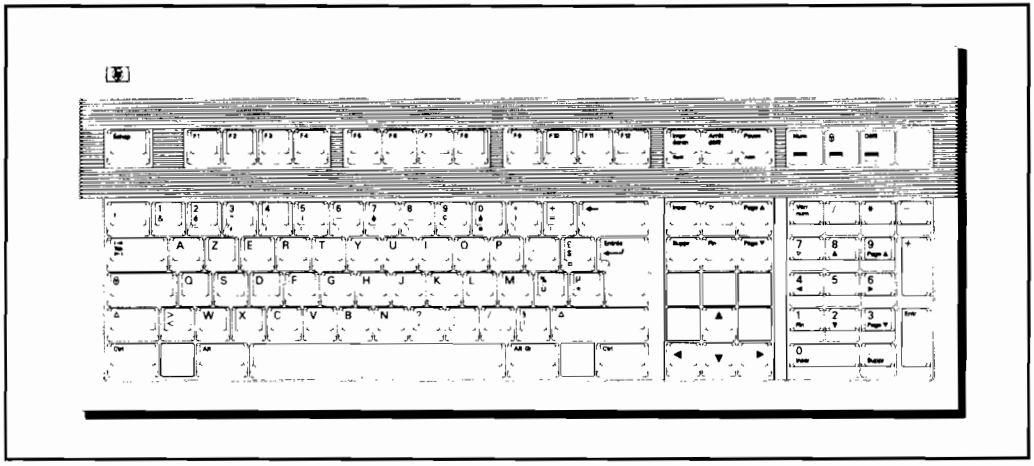
German



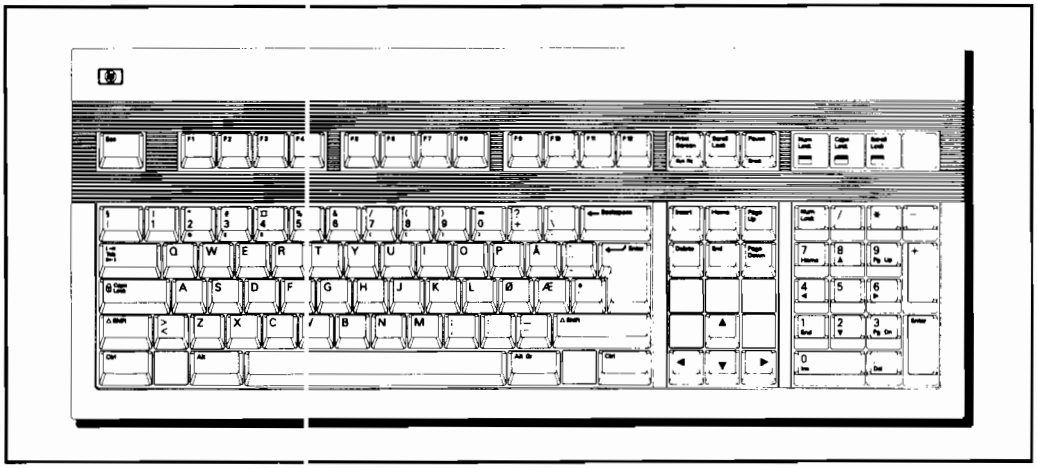
Spanish



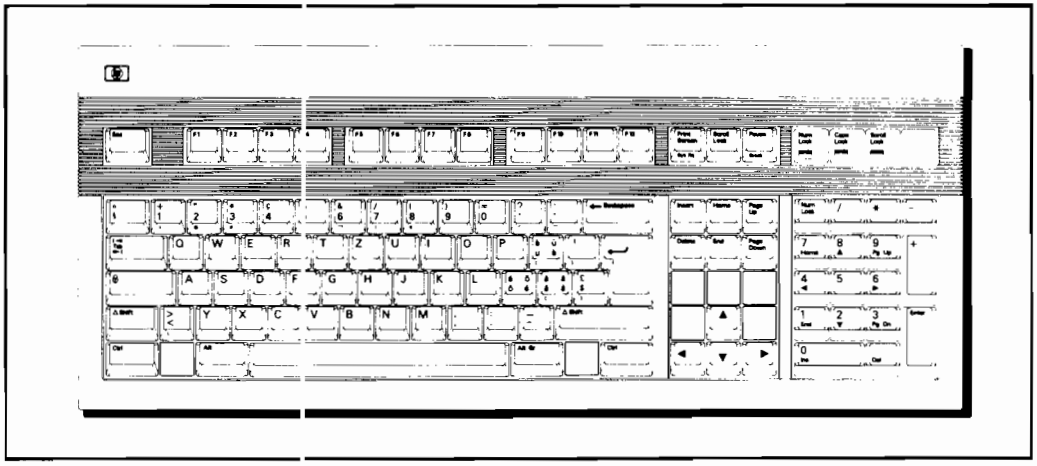
French



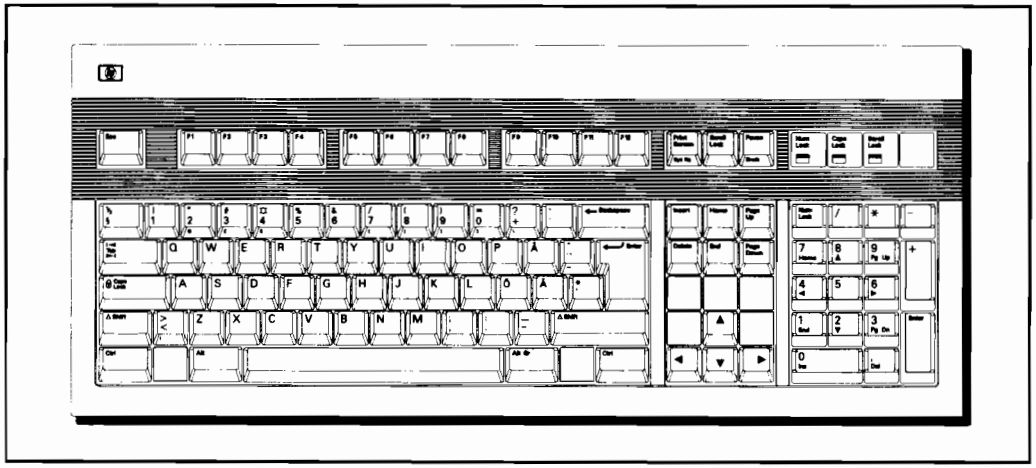
Norwegian



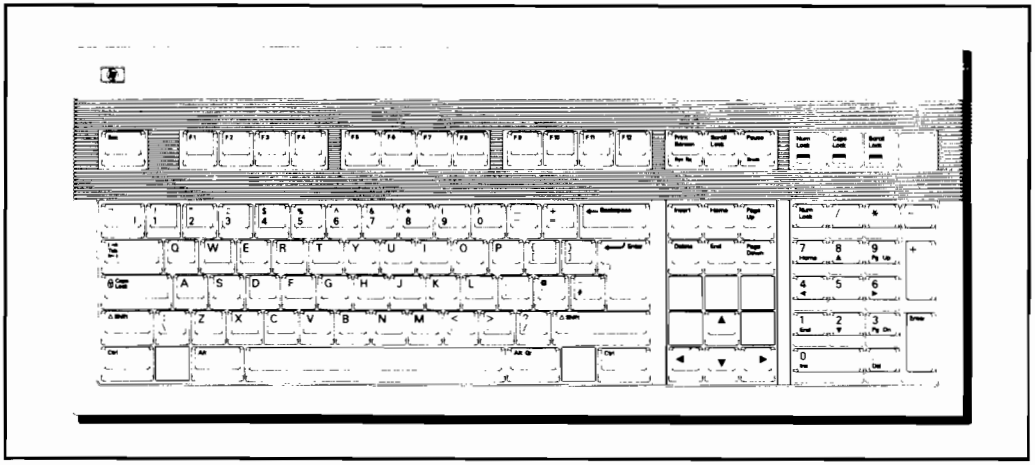
Swiss French/Swiss German



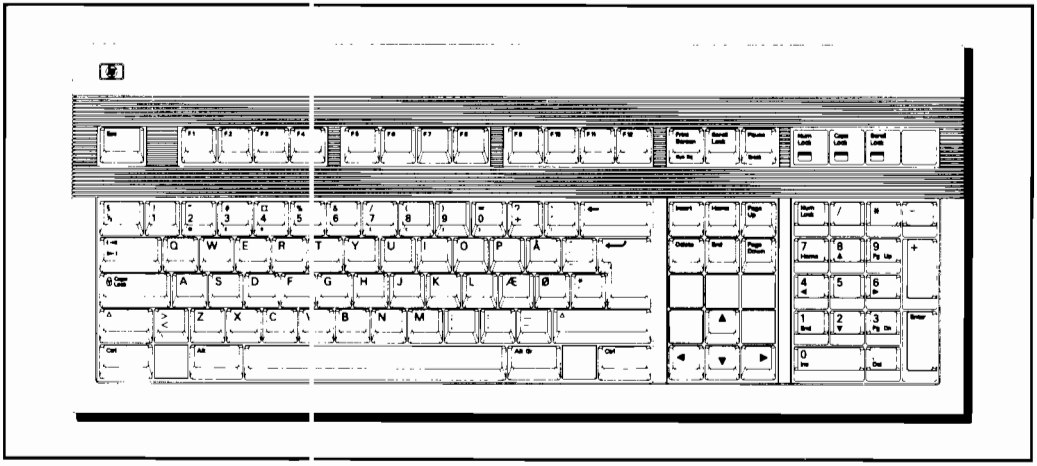
Swedish/Finnish



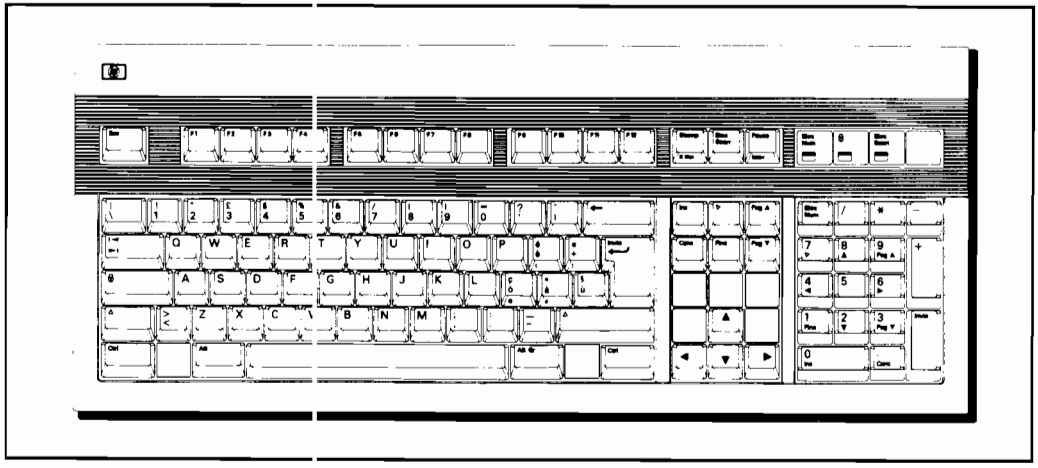
U.K./English



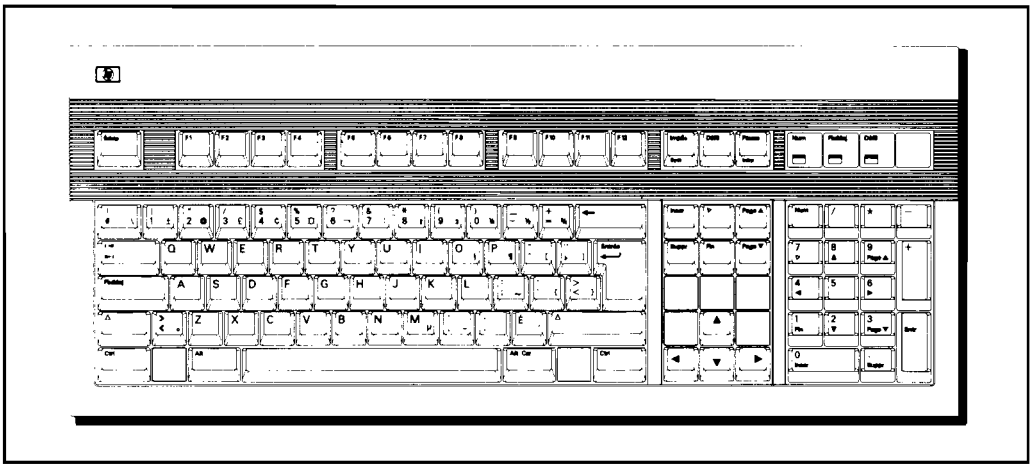
Danish



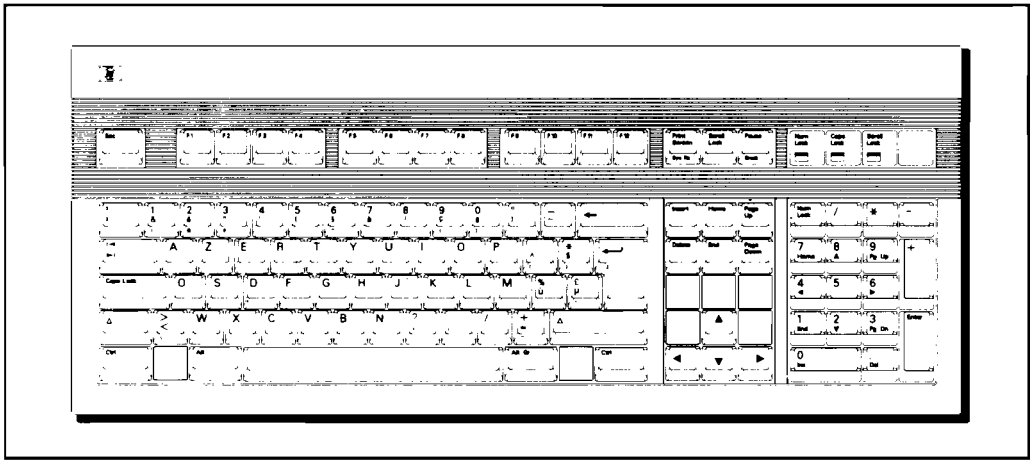
Italian



French Canadian



Belgian



11

Controlling Computer Functions

This chapter explains how to press a sequence of keys to:

- cancel MS-DOS commands,
- change the volume of your keyboard click,
- restart your computer,
- type extended characters,
- and change the processing speed of your computer.

Canceling a Command

To cancel an MS-DOS command *before* you press [Enter], hold down [Ctrl] and press [Pause].

Changing the Volume of the Keyboard Click

To *decrease* the volume of your keyboard click during your work session, press [Ctrl] [Alt] [−]. Hold down the keys until you reach a satisfactory volume, then release them. *You must use the [−] key on the numeric keypad.* You can use either the [Alt] key or the [AltGr] key (found in non-U.S. keyboards).

To *increase* the volume, press [Ctrl] [Alt] [+].

The click volume returns to normal when you restart the computer,

You can set the keyboard click so that it is either ON or OFF all the time by running the SETUP program. For more information, see Chapter 8 "Configuring Your Computer".

Restarting the Computer

To restart your computer, hold down Ctrl and Alt, and press Del at the same time. This performs a soft reset.

Use Ctrl Alt Del instead of turning your computer's power OFF and ON (a hard reset).

You can use the Delete key on the cursor keypad or the Del key on the numeric keypad. Use the Alt key—*not* AltGr (found on non-U.S. keyboards).

Caution

Be careful not to restart your computer when you are in an application program and have created data which has NOT yet been saved. If you do so, you will lose the data.

Typing Extended Characters

The keys on your keyboard cannot type all the possible characters that are supported by your computer. A set of extended characters that include international, math, and line drawing characters can be typed using special key sequences.

If you are using MS-DOS, you can type extended characters by first holding down the Alt key and typing the decimal code for the character on the numeric keypad, then releasing the Alt key (AltGr cannot be used).

You can find tables of supported characters (which may also be referred to as code pages) in your MS-DOS reference manual.

Changing the Processing Speed of Your Computer

The HP Vectra QS supports multiple speeds. A low speed of 8 MHz and a high speed of:

16 MHz for the *HP Vectra QS/16S*
20 MHz for the *HP Vectra QS/20*

The HP Vectra QS comes preset from the factory to run at its highest speed. You can switch back and forth between the high and low speeds by using any of the following methods.

- **Method 1:** Using a computer control key sequence.
- **Method 2:** Using the HPMODE command.
- **Method 3:** Using the SETUP program.

Method 1: Using Computer Control Keys

This method is useful if you are using an application that must be *started* at low speed, but can be switched to high speed during normal use (such as some copy-protected applications).

For U.S. keyboards, switch speeds by holding down Ctrl and Alt, and pressing \ at the same time. You will hear the computer beep once when you have set it to low speed, and twice when you have set it to high speed.

Key sequences for most non-U.S. keyboards are listed in the following table:

Keyboard	Key Sequence
Belgian	Ctrl Alt μ
Danish	Ctrl Alt '
French	Ctrl Alt *
French Canadian	Ctrl Alt }
German	Alt Strg #
Italian	Ctrl Alt ù
Norwegian	Ctrl Alt '
Spanish	Control Alt Ç
Swedish/Finnish	Ctrl Alt '
Swiss	Ctrl Alt $
U.K./English	Ctrl Alt #
U.S.	Ctrl Alt \

Method 2: Using the HPMODE Command

HPMODE is an MS-DOS command utility that you will find on the SETUP AND UTILITIES DISK that comes with your computer. The syntax for using HPMODE to change the processor speed is:

*drive:**path*\`HPMODE SPEED` *speed* Enter

where:

drive	is the drive that contains the HPMODE command
path	is the path to the HPMODE command
speed	is the computer speed—possible values are the words HIGH and LOW. If you do not specify a speed, the current setting is displayed.

There are two ways to use the HPMODE command to change speed:

- Type the command you want at the MS-DOS prompt, for example, to change the speed from HIGH to LOW, type

  `HPMODE SPEED LOW` Enter

- Or, create a batch file that lowers the speed by issuing the HPMODE command, starting the application, and then resetting the computer back to its high speed when you exit the application. For example:

  ```
  HPMODE SPEED LOW
  123.EXE
  HPMODE SPEED HIGH
  ```

  See your MS-DOS documentation for more information on batch files.

Method 3: Using the SETUP Program

Use the SETUP program, found on the SETUP AND UTILITIES DISK that comes with your computer, to change the speed in effect when you start your computer. (This is called the "default" speed.) To change the default speed, run option 6 of the SETUP program and follow the instructions on your screen. Refer to Chapter 8, "Configuring Your Computer", for information about running the SETUP program.

Performance Tuning

Performance is very application and workload dependent. You can improve the performance of your HP Vectra personal computer by selecting the appropriate accessories, configuring the system software, and tuning the system. Follow the guidelines below to maximize performance.

Selecting Accessories

More memory is better!

For MS-DOS users, increased memory means that that you can allocate up to 1 MB for disk cache and still have plenty of memory for running large applications that use LIM EMS expanded memory such as Microsoft(R) Windows/286 or Windows/386 for the Vectra PC.

For OS/2, XENIX, and UNIX users, it will allow you to multi-task large protected mode applications.

You can increase the memory on the Vectra QS by adding memory modules, see Chapter 4.

The HP Expanded Memory Manager program supports the LIM (Lotus/Intel/Microsoft) Expanded Memory Specification 4.0. This program takes advantage of the 80386's capabilities to emulate expanded memory with extended memory. This design makes memory management significantly faster than 80386 systems configured with a memory card in an AT-compatible bus.

A numeric coprocessor will significantly increase the speed of floating point-intensive applications that support any of Intel's 80X87 math coprocessors, such as Lotus(R) 1-2-3(R) and Autodesk's AutoCAD(R).

Configuring

1. If you have MS-DOS 3.3, use the Volume Expansion Utility to partition your hard disk for MS-DOS. Running a disk-intensive application on an expansion partition greater than 32 MB can increase performance by up to 20%. Refer to the Volume Expansion manual for more details.

2. MS-DOS users should ensure that the HPCACHE disk cache program is installed in extended or expanded memory. disk cache can increase performance by up to a factor of three, depending on the application.

   Putting the cache in extended memory is significantly faster for about 90% of the applications tested. Allowing block moves (/B+ flag set in command line of HPCACHE) allows data to be copied to and from the cache in batches of sectors. This setting increases performance by up to 35% (for example, on R:BASE System V).

   A disk cache size of 256 to 1024 KB is desirable. For example, `HPCACHE /E /B+` would create a 256 KB cache in extended memory with batch transfers enabled. To adjust the HPCACHE parameters, first increase the size of the cache. Then compare performance when the cache is in extended memory versus expanded memory. As mentioned above, the greatest performance is usually achieved in extended memory, with batch transfers enabled (`/E /B+`). Refer to the HPCACHE manual for more information.

   WARNING: The `/E /B+` option may interfere with some communications programs at 2400 baud or higher, for example, networks. If you experience problems with your programs, either disable batch transfers (`/E /B-`) (the /B option can be disabled from the MS-DOS command line or in a batch file), or refer to the Expanded Memory Manager/386 utility in Chapter 9, and place HPCACHE in expanded memory (`/A+`).

3. Check the SETUP program to ensure that the processor speed is set to the highest speed supported by your system, see Chapter 8.

4. Adjust the number of MS-DOS buffers. This is controlled by a line in the `CONFIG.SYS` file in the root directory of the C: volume. MS-DOS buffers act like a disk cache in base memory. If you do not have HPCACHE installed, more buffers will improve disk performance, but may decrease CPU/memory subsystem performance because they are using up base memory. There is an optimum number of buffers for every application and workload.

   A specific number of buffers may increase performance on one application but decrease it on another. Your selection of the numbers of buffers should be based on the performance of your high priority applications.

The larger the disk volume you made with the Volume Expansion Utility, the more effective your MS-DOS buffers will be (and the more base memory they will consume). Start with a value between five (large disk volumes) and 30 (small disk volumes) and experiment by increasing and decreasing them.

HPCACHE performs a similar function as the buffers mentioned above, but is more efficient. Therefore, if you have the HPCACHE program installed, reduce the number of buffers to 5 or 10 (by using the **BUFFERS=** command in the CONFIG.SYS file) for peak performance.

NOTE: You must restart your system by pressing CTRL, Alt and DEL simultaneously for the new buffer value to take effect.

12

Using Flexible Disks

Your computer can use various types of flexible disk drives that are technologically different and not completely compatible with each other. The most common types of internal flexible disk drives are:

- **1.2 MB flexible disk drive.** It uses Hewlett-Packard 5.25-inch, high capacity, double-sided 96 TPI flexible disks (part number 92190X).
- **360 KB flexible disk drive.** It has an asterisk (*) embosssed on the front of it and uses Hewlett-Packard 5.25-inch, double-sided flexible disks (part number 92190A).
- **1.44 MB flexible disk drive.** It uses two types of 3.5-inch flexible disks: Hewlett-Packard 1.44 MB 3.5-inch, high density flexible disks (part number 92192X), or Hewlett-Packard 710/720 KB 3.5-inch, double-sided flexible disks (part number 92192A).

5.25-Inch Disks

Data on these disks can be shared with other HP Vectras and IBM PC, XT, or AT personal computers that use 5.25-inch disks. The table below shows how these disks *can* and *cannot* be interchanged between the different disk drives. This applies to all HP Vectra computers.

Matching 5.25-Inch Disks with Drives

Disks	In 360 KB Drive	In 1.2 MB Drive
360 KB disk (double-sided)	read and writes	reads *only*
1.2 MB disk (high-capacity)	do not use in this drive	reads and writes

3.5-Inch Disks

The 1.44 MB internal flexible disk drive can use *only* double-sided 3.5-inch disks.

HP Vectra computers with the 1.44 MB internal flexible disk drive have full interchange capabilities with disks formatted as either HP 710 KB, IBM 720 KB or IBM 1.44 MB.

Note

You need to install the 3.5-inch flexible disk drive software utility. Refer to the chapter, "Installing and Using the HP Utilities."

13

Computer Specifications

The Controller Card

The Vectra QS comes with a controller card installed in accessory slot 7. This card contains a:

- 9-pin serial connector (SER) for a serial device (printer, plotter, etc.)
- 25-pin parallel connector (PAR) for a parallel device (printer, plotter)
- Connector for a hard disk drive (HDD)
- Connector for a flexible disk drive (FDD)

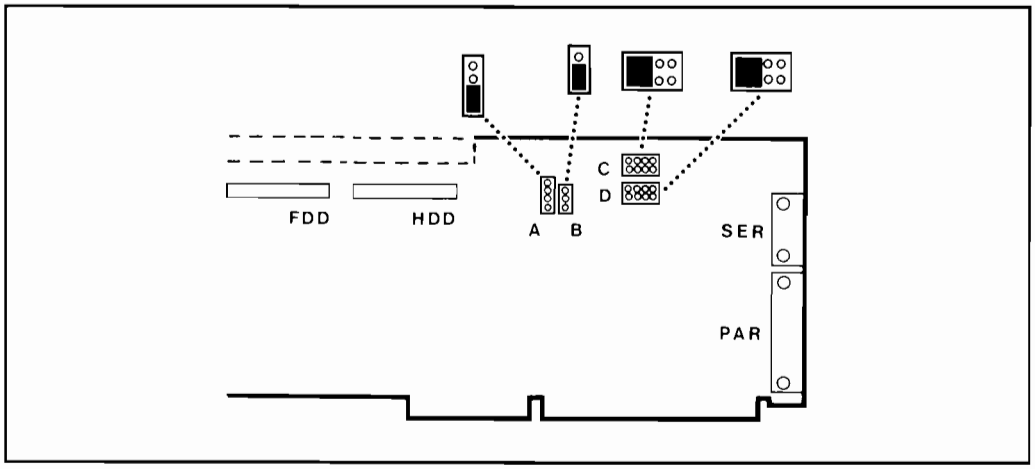
There are several different types of card available, depending on the disk drive that came installed in the computer.

1. The ST-506 card is used with computers with a lower capacity ST-506 hard disk drive (40 MB or less). The ST-506 card is a "full-length" card with a notch along the top edge.
2. The ESDI card is used with computers with a higher capacity ESDI hard disk drive (100 MB or more). The ESDI card is a "full-length" card but WITHOUT a notch along the top edge.
3. The AT Multifunction Controller Card is used with computers with hard disk drives with an embedded-AT controller (typically 42 MB or 84 MB). The multifunction card is a "half-length" card.

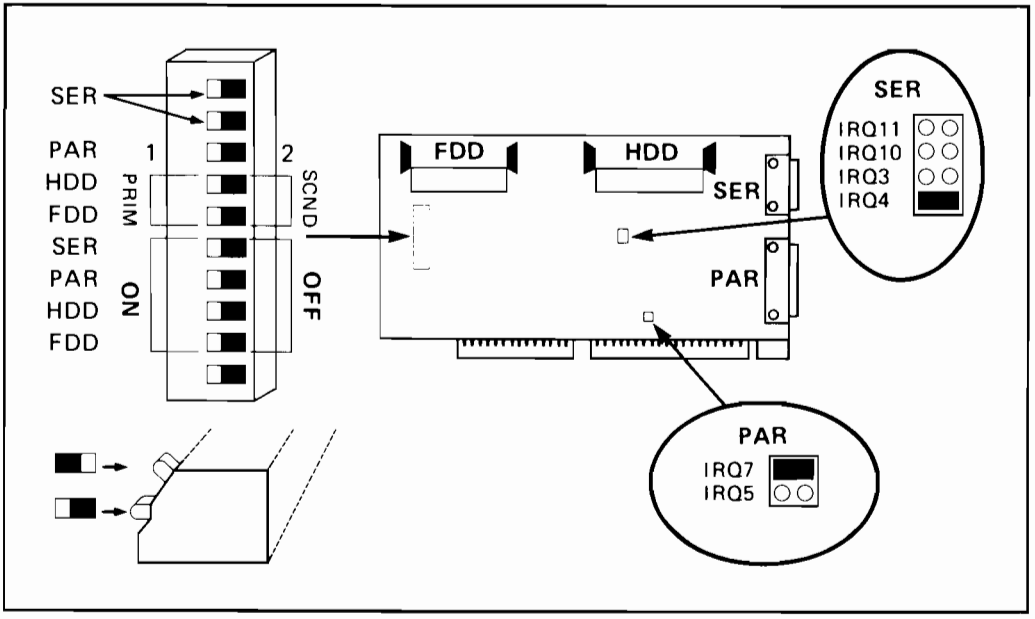
Appendix B lists the controller card delivered with your computer.

The card contains jumpers which are set to these defaults (factory settings):

A. Flexible disk controller set to primary address
B. Hard disk controller set to primary address
C. Parallel port set to parallel port 1 (LPT1)
D. Serial port set to serial port 1 (COM1)



Jumpers on ST-506 (notched) and ESDI Cards

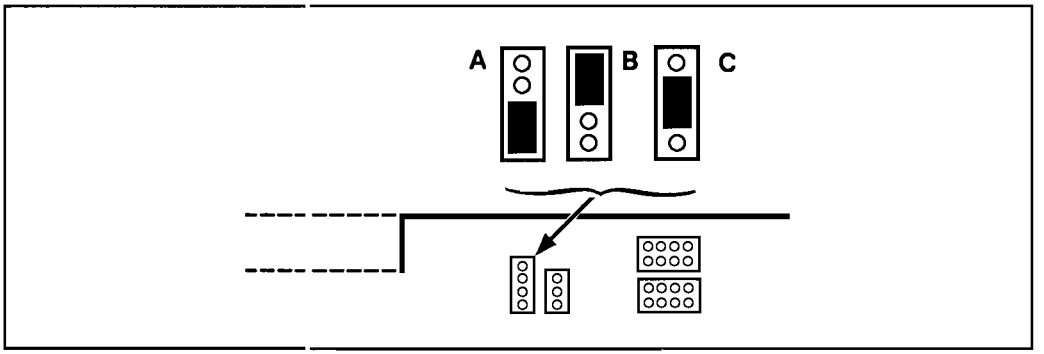


Switches on AT Multifunction Controller Card

ST-506 and ESDI Cards

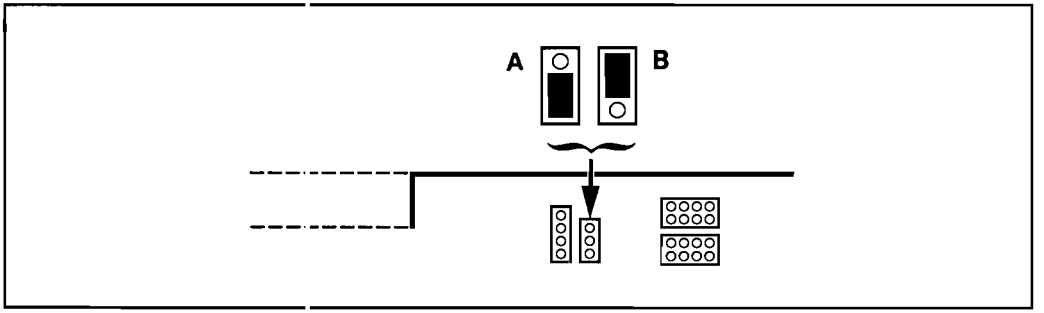
ST-506 and ESDI Flexible Disk Controller (FDD)

The flexible disk controller can be set to the primary address (A—the default), the secondary address (B), or it can be disabled (C).



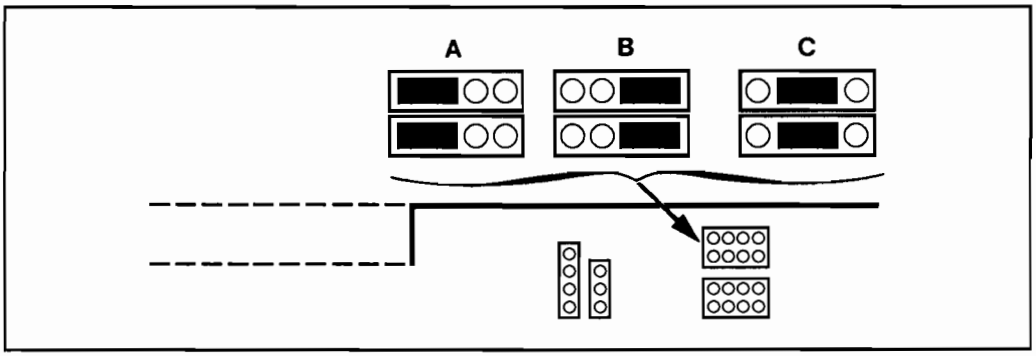
ST-506 and ESDI Hard Disk Controller (HDD)

The hard disk controller can be set to the primary address (A—the default) or the secondary address (B).

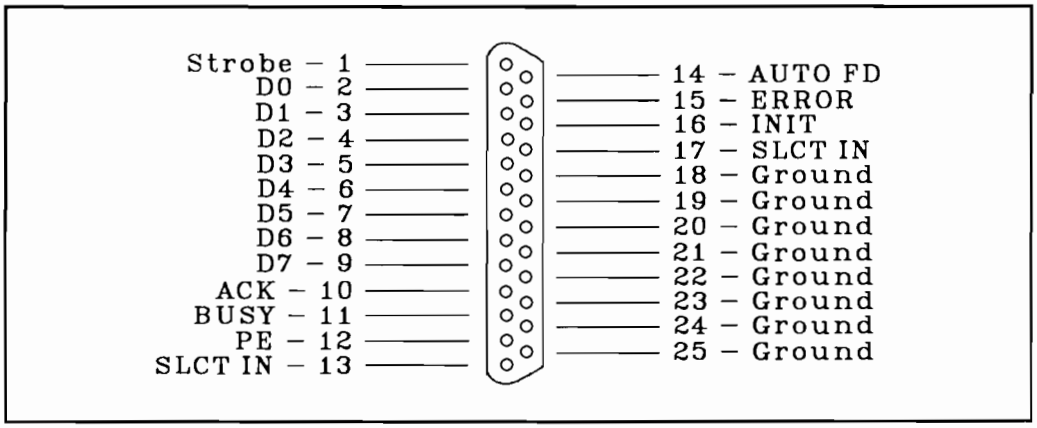


ST-506 and ESDI Parallel Port (PAR) Jumper Settings

The parallel port can be configured as parallel port 1 (A—LPT1), parallel port 2 (B—LPT2), or it can be disabled (C).

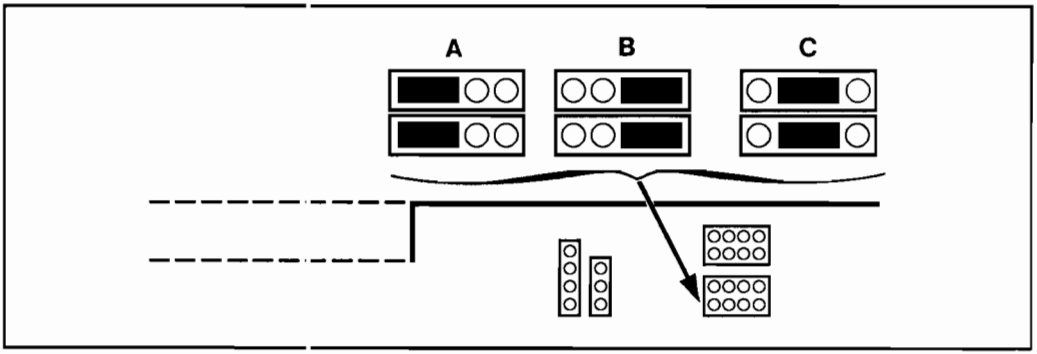


Parallel Connector Pinouts

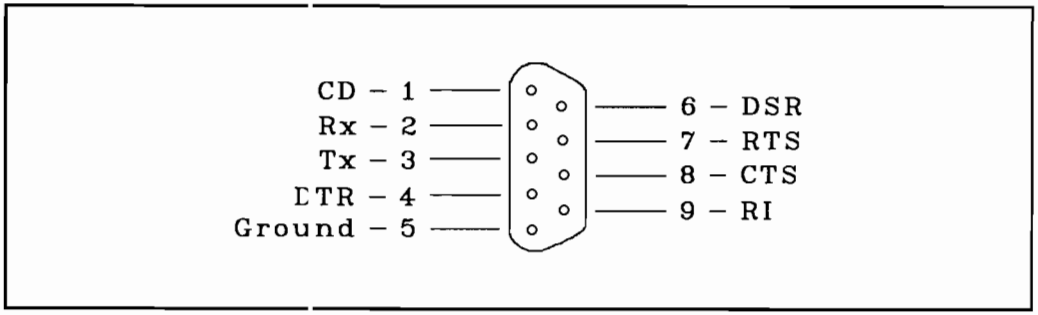


ST-506 and ESDI Serial Port (SER) Jumper Settings

The serial port can be configured as serial port 1 (A—COM1), serial port 2 (B—COM2), or it can be disabled (C).



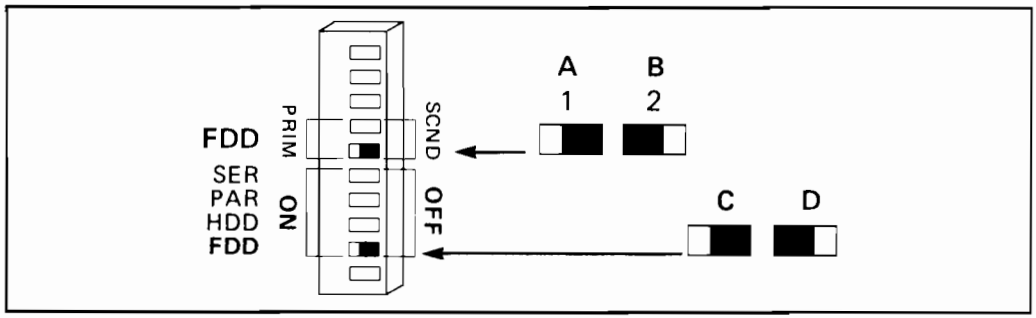
Serial Connector Pinouts



AT Multifunction Controller Card

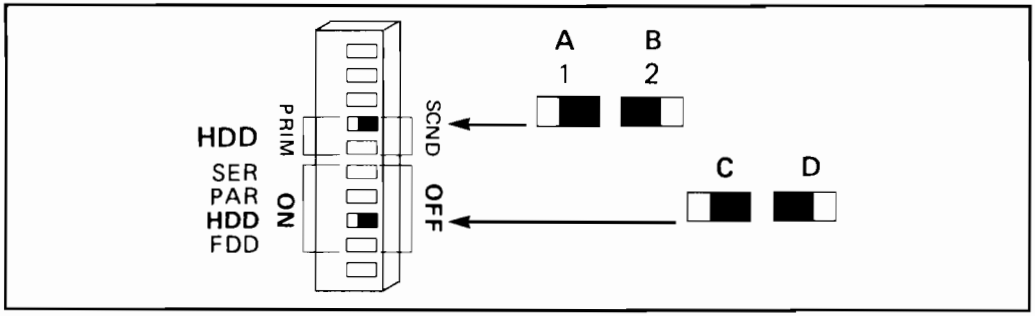
AT Multifunction Card Flexible Disk Controller (FDD)

When the flexible disk controller is enabled (C) it can be set to the primary address (A— the default), the secondary address (B), or it can be disabled (D).



AT Multifunction Card Hard Disk Controller (HDD)

When the hard disk controller is enabled (C) it can be set to the primary address (A— the default), the secondary address (B), or it can be disabled (D).



AT Multifunction Card Serial Port (SER) Settings

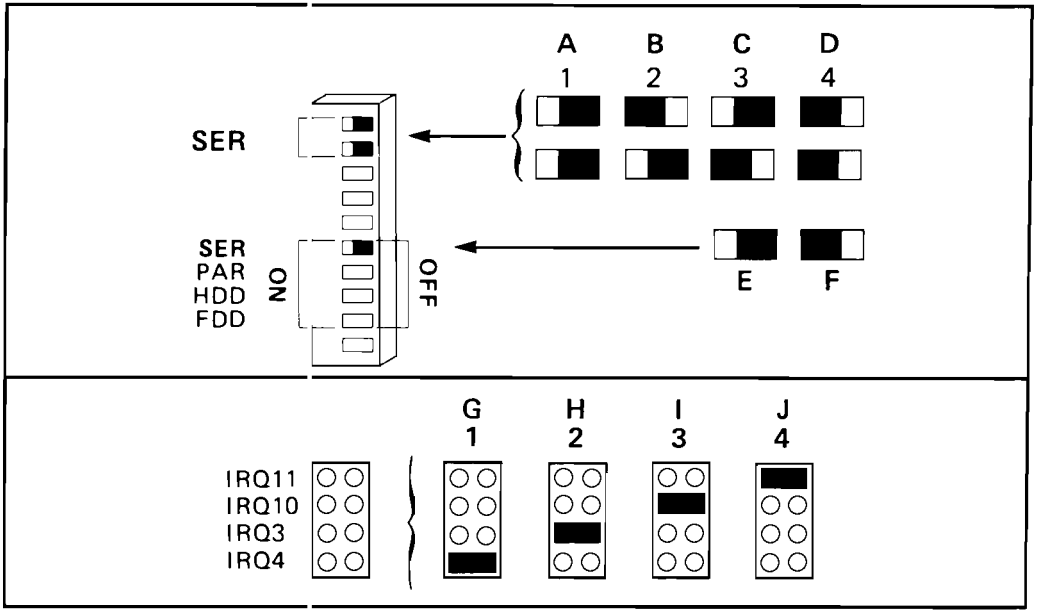
When the serial port is enabled (setting E) it can be configured using the switches as:

- Serial port 1 (COM1--setting A, default),
- Serial port 2 (COM2--B),
- Serial port 3 (COM3--C),
- Serial port 4 (COM4--D),

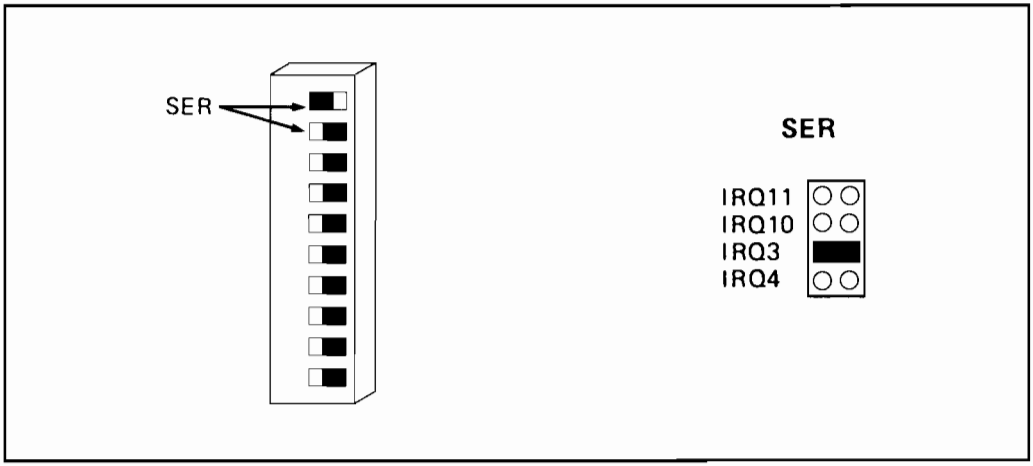
or it can be disabled (F).

In addition, when the serial port is enabled, you must use the jumper to select the IRQ (Interrupt Request number) used by the port:

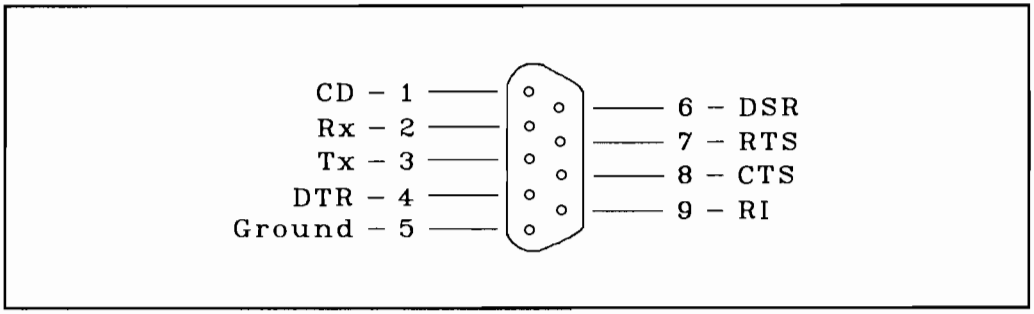
If you use:	Select:
COM1	IRQ4 (setting G, default)
COM2	IRQ3 (H)
COM3	IRQ10 (I)
COM4	IRQ11 (J)



Example: If you want to use the serial port as serial port 2, you must select COM2 (setting B) on the switches and IRQ3 (setting H) on the jumpers.



Serial Connector Pinouts



AT Multifunction Card Parallel Port (PAR) Settings

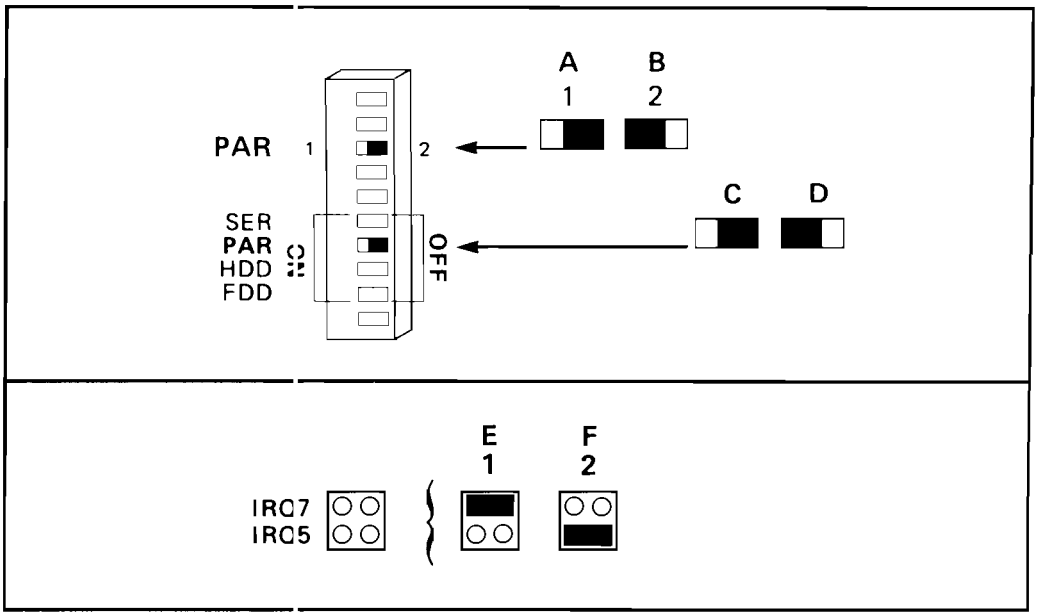
When the parallel port is enabled (setting C) it can be configured using the switches as:

- Parallel port 1 (LPT1—setting A, default),
- Parallel port 2 (LPT2—B),

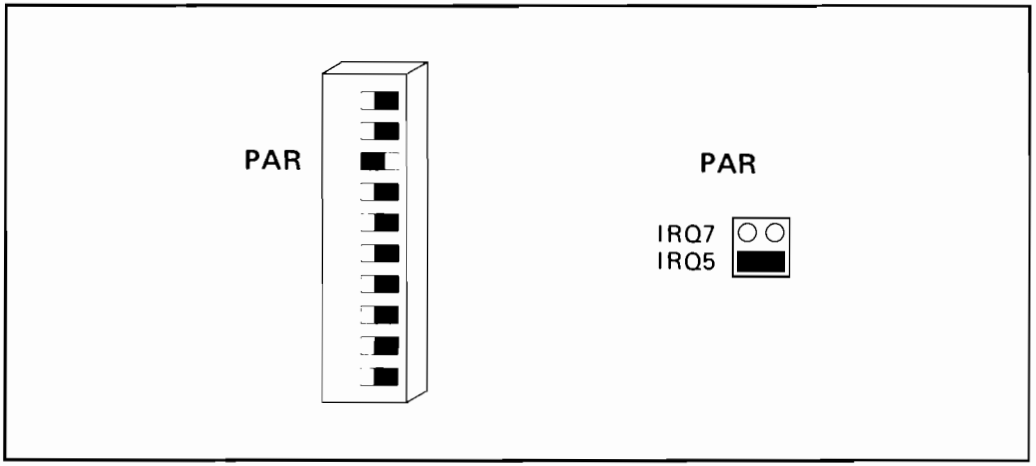
or it can be disabled (D).

In addition, when the parallel port is enabled, you must use the jumper to select the IRQ (Interrupt Request number) used by the port:

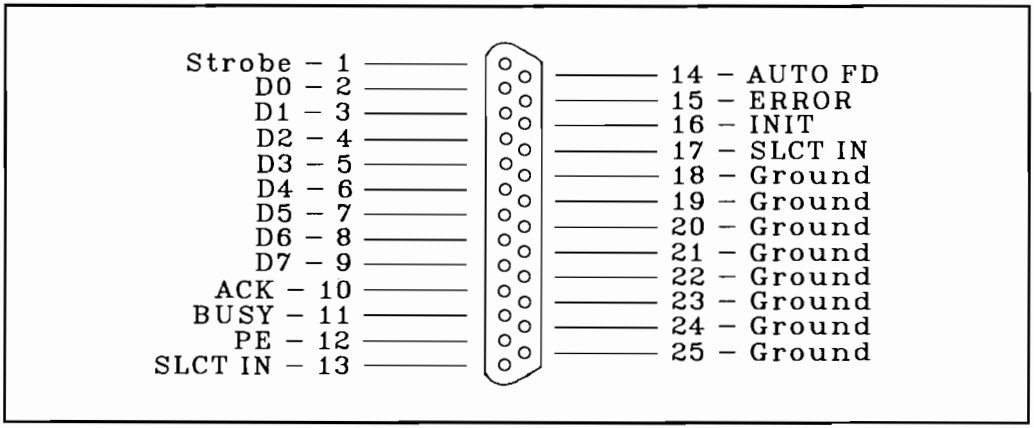
If you use:	Select:
LPT1	IRQ7 (setting E, default)
LPT2	IRQ5 (setting F)



Example: If you want to use the parallel port as parallel port 2, you must select LPT2 (setting B) on the switches and IRQ5 (setting F) on the jumpers.



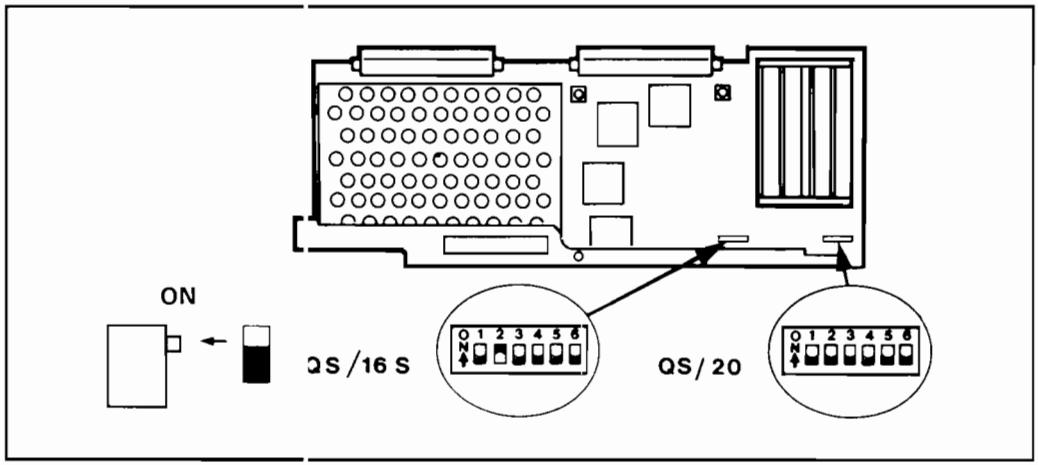
Parallel Connector Pinouts



Processor/Memory Card Switch Settings

The Processor/Memory Card contains a bank of six switches. Change these switches only if:

- a numeric coprocessor is installed
- you want to change the I/O channel speed (QS/20 only)
- you want to change the system base memory.



Default Processor/Memory Card Switch Settings

Switch #	Description	Possible Settings	QS/16S	QS/20
1	Coprocessor	**ON** = Not installed **OFF** = Installed	ON	ON
2	I/O channel speed	**ON** = 8 MHz asynchronous **OFF** = Synchronous QS/16S: 8 MHz QS/20: 10 MHz	OFF	ON
3	System base memory	**ON** = 640 KB **OFF** = 512 KB	ON	ON
4	Option ROMs	**ON** = Enabled **OFF** = Disabled	ON	ON
5	Reserved	Do NOT change	ON	ON
6	Processor speed	**ON** = Synch QS/16S: 16 MHz QS/20: 20 MHz **OFF** = 16 MHz asynchronous	Not used	ON

Switch 2 on the QS/20 should only be set OFF if **all** the accessory cards can operate at 10 MHz.

The Video Graphics Adapter (VGA)

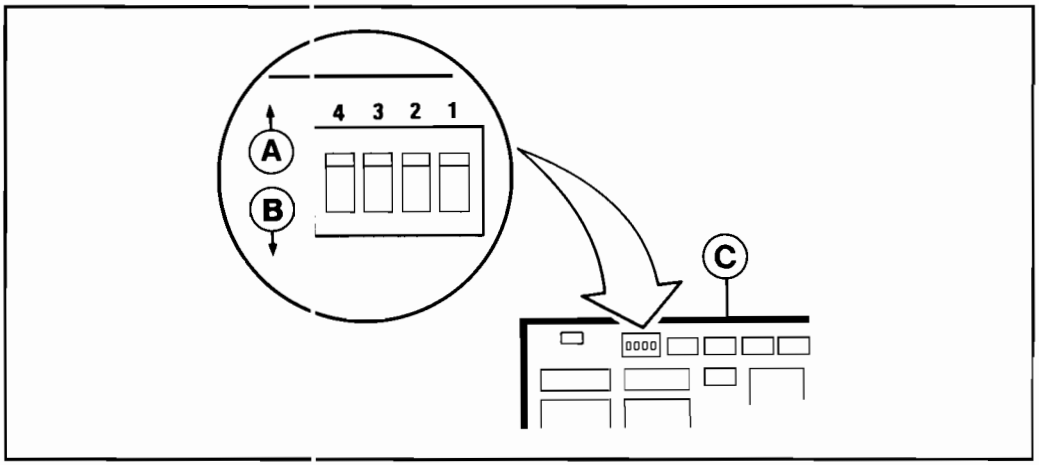
Some HP Vectra computers come with a VGA preinstalled from the factory. The two main supported features of any VGA are:

- Settings to access faster display performance.
- Dual-display operation.

Dip Switch Settings

The HP VGA has four dip switches located near the top of the card (C). These switches are preset at the factory so that the card will work single-display systems.

In the following illustration, the switches are shown in the "up" position (A) to indicate that they are "on." To change a switch to the "off" setting, you would move it to the "down" position (B).



- Switches 1 and 2 control computer-specific options.
- Switch 3 controls the single/dual display options.
- Switch 4 is reserved (not currently used).

Setting the VGA for 8-Bit Operation

Switch 4	Switch 3	Switch 2	Switch 1
OFF	OFF	OFF	OFF

This setting switches the VGA to 8-bit operation.

Setting the VGA for 16-Bit Operation

Switch 4	Switch 3	Switch 2	Switch 1
OFF	OFF	OFF	ON

This setting is compatible with an HP Vectra QS. It switches the card to 16-bit display operation. The card must be installed in one of the computer's 16-bit accessory slots.

Setting the VGA for Single- or Dual-Display Operation

This setting switches the VGA card to single- or dual-display operation.

Single display operation lets you use *either* a color or a monochrome display. **Dual display** operation lets you use *two* displays and also provides automatic use of either display as required by your application programs.

You can use any of the following combinations of cards, displays, and switch settings for **dual display** operation:

Card/Display	Switch 4	Switch 3	Switch 2	Switch 1
Card #1: HP VGA connected to color display	OFF	OFF	OFF	OFF
Card #2: HP VGA connected to monochrome display	OFF	ON	OFF	OFF
Card #1: HP VGA connected to color display	OFF	OFF	OFF	OFF
Card #2: MDA-compatible* connected to monochrome display	see the MDA card manual for complete details			

* Such as the HP 35732 Monochrome Plus Card and display or the Hercules card and display. These cards must be set for monochrome operation—see the manual that came with the card for information about the switches for monochrome operation.

You cannot use the following cards for dual display operation:

- The Color Graphics Adapter (CGA)
- The Enhanced Graphics Adapter (EGA)
- The HP Multimode Video Adapter

14

Changing the Battery Pack

Warning

Your computer uses lithium batteries which may explode if mishandled. DO NOT recharge or disassemble them, and DO NOT dispose of them by burning. Also, when the batteries need replacement, use only lithium batteries (HP part number 45935-60008) available from your dealer or HP sales representative. Use of any other batteries risks explosion or fire.

The batteries in your computer keep the accurate date and time. They also preserve your SETUP program configuration information in memory.

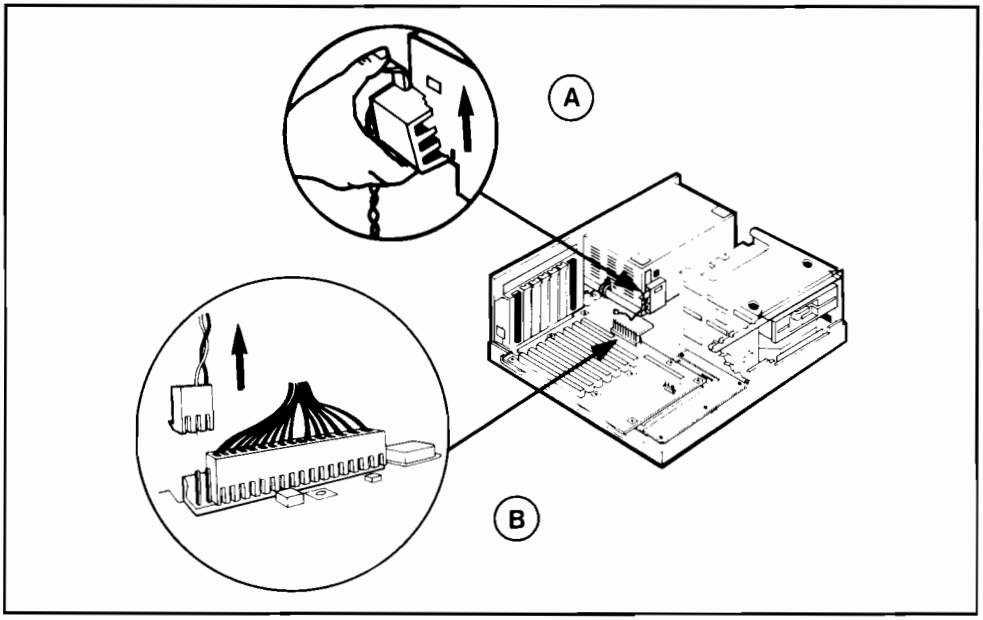
When your batteries wear out (every 3 to 5 years), you see this message every time you turn on the computer:

```
Invalid configuration information - Run SETUP program
```

To change the battery pack, follow the steps below.

1. **Switch OFF the computer and remove the cover.** See Chapter 2.
2. **Remove the power switch shaft.** See Chapter 5.
3. **Remove the battery holder.** Press down on the plastic latch at the top of the battery holder, then lift up on the battery holder to detach it from the side of the power supply. See A on figure below.

4. **Disconnect the battery wire from its connector.** See B on figure below.



5. **Remove the old battery pack from the battery holder.**
6. **Insert the new battery pack into the battery holder.** Make sure the battery pack label faces in.
7. **Reinstall the battery holder to the side of the power supply.**
8. **Reconnect the battery wires.** See B on figure above.
9. **Replace the power switch shaft and the cover.** See Chapters 5 and 2.
10. **Connect all cables and power cords.** See Chapter 1.
11. **Run option 1 (Set System Configuration) of the SETUP program.** Refer to Chapter 8, "Configuring Your Computer", for details.

15

Troubleshooting and Error Messages

If the computer does not work - NO error message

1. Check that the computer and display are switched ON.
2. Try adjusting the contrast and brightness controls of the display.
3. Make sure that all cables and power cords are firmly plugged into their proper receptacles (see Chapter 1).
4. If the computer still does not work:
   a. Turn off the display, the computer, and all external devices.
   b. Unplug all power cords and cables, noting their positions.
   c. Remove the cover (see Chapter 2).
   d. Check that all accessory cards are firmly seated in their slots.
   e. Verify that any switches and jumpers on the cards are properly set. (Refer to the manuals that came with each card for more information.)

      If you have installed a new interface card, make sure there are no interrupt and address range conflicts.
   f. Check the configuration of the video interface card. (Refer to "The Video Graphics Adapter (VGA)" in Chapter 13 for more information.)
   g. Verify that you have installed your memory modules correctly. (Refer to "Installing Memory Modules" in Chapter 4 for more information.)
   h. Check that the coprocessor is installed properly. A pin can become bent under the coprocessor while appearing to be correctly seated in its socket. (Refer to "Installing a Numeric Coprocessor" in Chapter 4 for more information.)
   i. Replace the cover (see Chapter 2).

j. Connect all cables and power cords (see Chapter 1).

k. Turn on the display.

l. Turn on the computer.

If the computer works - but an application does not run

Determine the speed at which your application must operate, and adjust your processing speed if necessary.

Refer to your application's manual to determine the speed at which your computer must run.

Refer to the "Changing the Processing Speed of Your Computer" section in Chapter 11 for more information about changing processing speeds.

If the mouse does not work

Verify that you have installed the correct mouse driver.

You should have installed *either* MOUSE.SYS *or* MOUSE.COM, but not both. (Refer to Chapter 9, "Installing and Using the HP Utilities," for more information.)

If you cannot format 3.5-inch disks:

Note

The DRIVPARM and DEVICE = INDSKBIO.SYS statements in the CONFIG.SYS file are needed only if you want backward compatibility with an HP 150/Touchscreen, HP 110 Portable, or HP Portable Plus.

1.44 MB disks

Your INDSKBIO.SYS driver is either not installed, or the DRIVPARM statement in your CONFIG.SYS file is not correct.

Refer to your installation guide to make sure that the DRIVPARM statement is correct.

720 KB disks

1. Make sure you use the correct parameters with your FORMAT command. The command should be:

   ```
   format <drive>  /t:80 /n:9
   ```

2. Run the SETUP program to make sure that the 3.5-inch disk drive is configured for the correct disk drive (see Chapter 8).

3. Check the version number of INDSKBIO.SYS. The version number will appear when you first turn on your PC. If you have version B.01.01, add the "AT0" switch to your CONFIG.SYS file, as shown below:

   ```
   DEVICE=INDSKBIO.SYS /AT0
   ```

   Note that "AT" must be capitalized, and the "0" is a zero.

If the printer does not work

1. Verify that the AC power cord is plugged into the power source and the printer.
2. Make sure the printer's power switch is ON.
3. Check that the printer is on-line.
4. Examine the paper feed for a paper jam.
5. Verify that you have the correct interface cable for your printer. Make sure that it is connected to the correct interface connector (port), and that it is securely connected at both ends.
6. Make sure that you have selected the correct port setting when you configured your printer. The printer should be configured correctly for your computer, and for your application. You may need to change some switch settings.
7. Check that your computer's port is working properly by running another peripheral connected to the port. Check to make sure that the port is configured the same way as the printer.
8. If you receive an error message on your display, go to your printer's user manual for help.

If the display does not work

Hardware Problems

If there is no video, but the computer turns on and the keyboard, disks, and other peripheral devices seem to operate properly:

1. Make sure that your display is plugged into the power source, and it is turned ON.
2. Check that the brightness and contrast controls are properly set.
3. Ensure that the display video connector cable is connected to the HP VGA video socket.

4. Turn off the display, unplug it from its power source, and examine the video cable pins to see if they are bent. If they are, carefully straighten them.
5. Remove the computer cover. Check that the video card is seated correctly in the slot. If it is not, disconnect the HP VGA card and reinstall it. (Refer to "Installing a Card" in Chapter 6 for more information, if necessary.)
6. Verify that your video card is properly configured:
   - Enhanced performance mode must be supported by your computer.
   - There must be no conflict between the peripheral adapter card and enhanced performance mode.

   Review "The Video Graphics Adapter (VGA)" section in Chapter 13. If the problem persists, your HP VGA card may be defective.
7. If your video card is installed in a 16-bit (not an 8-bit) accessory slot, check that the card is configured for 16-bit operation (switch 1 is in the ON/down position). Refer to "The Video Graphics Adapter (VGA)" section in Chapter 13 for details.
8. Make sure there is no conflict between the HP VGA card and another video card. The other video card must be an HP VGA, Hercules, or MDA-compatible card. Switch 3 must be ON (down) on the other video card.

Software Problems

If your application is not working properly:

- Your application may not automatically adapt to the VGA mode if you are using a monochrome monitor. Run the HPVGA.EXE program on the Vectra Setup and Utilities disk as described in the "Video Graphics Adapter (VGA) Utilities" section in Chapter 9. Select the "Switch to VGA Color" option.
- Check your application manual to find out which video mode is required. Use the HPVGA.EXE program on the Vectra Setup and Utilities disk to select the required mode. Refer to Chapter 9, "Installing and Using the HP Utilities," for more information.

If an error message appears

1. Copy the message on a piece of paper.
2. Find the error message in the "Error Messages" section of this Chapter and follow the suggested action.

   If the error message you found is not listed in the "Error Messages" section it may be an operating system error message. *Refer to your operating system manual for descriptions of these messages.*

   If the error message you found is not an operating system message and it is not in the "Error Messages" section, *it may be an applications message. Check your application's manual.*

Error Messages

This Chapter lists error messages in alphabetical order and gives an explanation of what to do, where necessary. Power-On and Self Test (POST) error codes appear on the screen as a number. POST error codes are listed in the *Vectra System BIOS Technical Reference Manual* (HP part number 45945-90012).

Note

For messages that do not appear here, refer to your operating system manual, your application manual, or your printer manual.

0341 0342 0343 0344 or 0345

Explanation: These are POST keyboard errors. Check your keyboard cable.

8310 8311 8312 8400 8401 8402 8403 8404 8405 8406 8407 8408
8409 840A 840B 840C 840D 840E 840F 8410 or 8411

Explanation: These are POST hard disk drive or controller errors. Check that you have installed the Controller Card correctly (refer to Chapter 13, "Computer Specifications"). Make sure the Controller Card is configured correctly.

Also check that you have formatted your hard disk. Refer to Chapter 8, "Configuring Your Computer."

9XYZ

Explanation: This is a POST flexible disk error. Check your options in the SETUP program. Refer to Chapter 8, "Configuring Your Computer."

Invalid configuration information -- Run SETUP program
Strike F1 to continue

Explanation: Your system may not be configured correctly. Run option 1 (Set System Configuration) of the SETUP program, as described in Chapter 8, "Configuring Your Computer."

Insert system disk in drive and press any key to continue

Explanation: There is no operating system disk in drive A and no operating system installed on drive C. Install your operating system, referring to the operating system manual.

`Non-system disk or disk error`

Explanation: Replace the disk with the proper disk and press any alphanumeric key to continue.

`Not ready error reading (or writing) drive` *x:*

Explanation: The device (usually a drive or printer) specified in the error message is not ready to accept or transmit data. This often happens when the disk drive door is open. If this is the problem, close the door and enter `R` (for Retry), or check to see if the printer is on and ready to print.

Where To Go For More Help

As part of the purchase of your system, arrangements were made to provide after-sale assistance:

- If your system was purchased from an Authorized Hewlett-Packard Reseller, they are committed to provide full after-sale support. Your reseller has worked with you to define your application and configuration—perhaps selecting hardware or software not supplied by HP—and is able to provide local, personal, and uniquely responsive support. Authorized Resellers are backed by the full resources of Hewlett-Packard.

  To locate an Authorized Hewlett-Packard Reseller, in the U.S. call (800) 752-0900, or contact your local Hewlett-Packard sales office.

- If your system was purchased directly from Hewlett-Packard, arrangements for after-sale support were made as part of the sale. You may select to purchase a Response Center contract from HP or obtain your assistance from a support group within your organization. Your internal support group has knowledge of your unique operating procedures and your specific configuration—including any non-HP components— ans is normally backed up by a Response Center contract from Hewlett-Packard.

A

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Media

HP warrants the media upon which this product is recorded to be free from defects in materials and workmanship under normal use for a period of **NINETY (90) DAYS** from the date of purchase. In the event any media prove to be defective during the warranty period, Customer's remedy shall be to return the media to HP for replacement. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

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The remedies provided above are Customer's sole and exclusive remedies. In no event shall HP be liable for any direct, indirect, special, incidental, or consequential damages (including lost profit) whether based on warranty, contract, tort, or any other legal theory. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Warranty Service

Warranty service may be obtained from the nearest HP sales office or other location indicated in the owner's manual or service booklet.

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North Hollywood, CA 91601

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Hewlett-Packard Company
2000 S. Park Place
Atlanta, GA 30339

B

Identifying Your Computer Model

This appendix describes the items which are *factory-installed* in your computer. Use this information to configure your computer with the SETUP program.

To determine what is factory-installed in your computer, you need to know your model's **Config Number.** You will find the Config Number on the label on your computer's back panel.

Note

Your dealer may have installed other items that are not shown in the following model lists. These items *may* have been listed by your dealer in the "Additional Items Installed" section at the end of this booklet.

HP Vectra QS Models

HP Vectra QS/16S Model 1 (Config Number D1482B), and
HP Vectra QS/20 Model 1 (Config Number D1492B)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

AT Multifunction controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 10 (Config Number D1470A)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

ST-506 controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/20 Model 10e (Config Number D1439A)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

ESDI controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/20 Model 15e (Config Number D1437A)

Items Installed:

1.44 MB, 3.5-inch flexible disk drive (drive A)

ESDI controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 46 (Config Number D1472B), and
HP Vectra QS/20 Model 46 (Config Number D1432B)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

42 MB hard disk drive, type 37 (drive C)

AT Multifunction controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 46 (Config Number D1472A), and
HP Vectra QS/20 Model 46 (Config Number D1432A)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

40 MB hard disk drive, type 44 (drive C)

ST-506 controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 47 (Config Number D1474B), and
HP Vectra QS/20 Model 47 (Config Number D1434B)

Items Installed:

1.44 MB, 3.5-inch flexible disk drive (drive A)

42 MB hard disk drive, type 37 (drive C)

AT Multifunction controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 47 (Config Number D1474A), and
HP Vectra QS/20 Model 47 (Config Number D1434A)

Items Installed:

1.44 MB, 3.5-inch flexible disk drive (drive A)

40 MB hard disk drive, type 44 (drive C)

ST-506 controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 86 (Config Number D1486B), and
HP Vectra QS/20 Model 86 (Config Number D1496B)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

84 MB hard disk drive, type 38 (drive C)

AT Multifunction controller card with a 9-pin serial port (COM2) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/16S Model 87 (Config Number D1487B), and
HP Vectra QS/20 Model 87 (Config Number D1497B)

Items Installed:

1.44 MB, 3.5-inch flexible disk drive (drive A)

84 MB hard disk drive, type 38 (drive C)

AT Multifunction controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

HP Vectra QS/20 Model 100e (Config Number D1435A)

Items Installed:

1.2 MB, 5.25-inch flexible disk drive (drive A)

108 MB hard disk drive, type 40 (drive C)

ESDI controller card with a 9-pin serial port (COM1) and a 25-pin parallel port (LPT1)

HP Video Graphics Adapter (the primary display is VGA)

1 MB memory: 640 KB memory, 384 KB reserved, 0 KB extended.

Additional Items Installed

If you have installed any additional items, use this section to record what you have installed, where it is installed, and how it is configured. For example: *VGA card in slot 2.*

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TERADKA TAPE ANCHOR BRAND

Setting Up and Using Your Vectra QS Reader Comment Card (D1450-90712)

Please take time to answer some questions about this manual. Although you will not receive a personal reply, your comments and suggestions are taken seriously because they are used to help us improve our publications. Also feel free to attach additional pages if you need more space.

Please circle the following Yes or No answers:

1. Is this manual well organized?	Yes	No
2. Is the information technically accurate?	Yes	No
3. Is the amount of information presented appropriate for your level of computer experience? (explain below)	Yes	No
4. Is it easy to find the information you need?	Yes	No
5. Are the explanations of concepts easy to understand?	Yes	No
6. Is the wording of the manual easy to understand?	Yes	No
7. Are the examples and pictures helpful?	Yes	No
8. Are there enough examples and pictures?	Yes	No
9. If English was not your mother tongue, were you still able to use this manual?	Yes	No

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Sunnyvale, CA 94086 USA

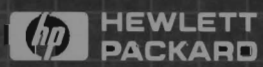
Fold

Fold

Tape

Please do not staple

Tape



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