HEWLETT PACKARD

Setting Up and Using Your HP Vectra 286/12 PC

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Regulatory Information

Refer to Appendix C.

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Contents

1

Setting Up Your HP Vectra 286/12 PC

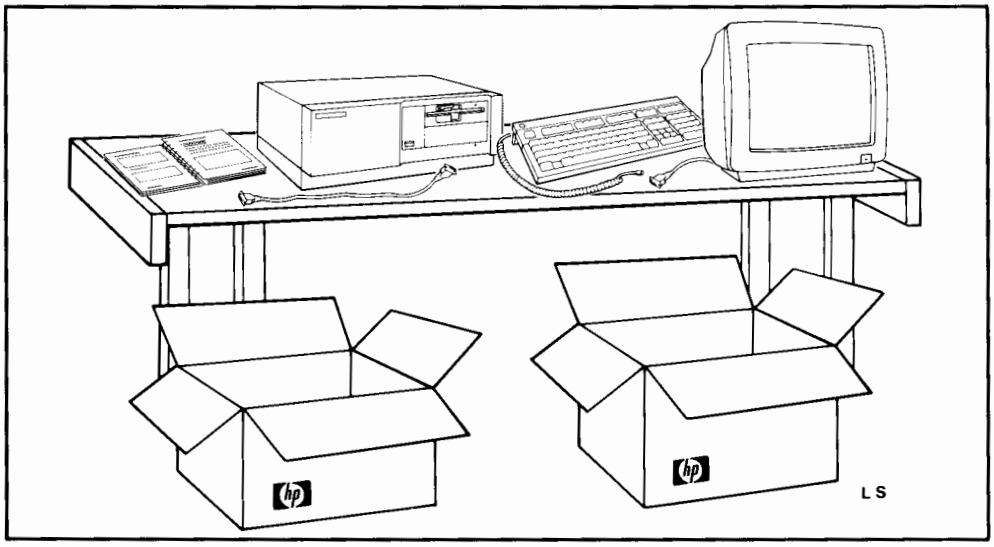
Welcome to your new HP Vectra 286/12 PC.

This section describes the steps necessary to set up your personal computer:

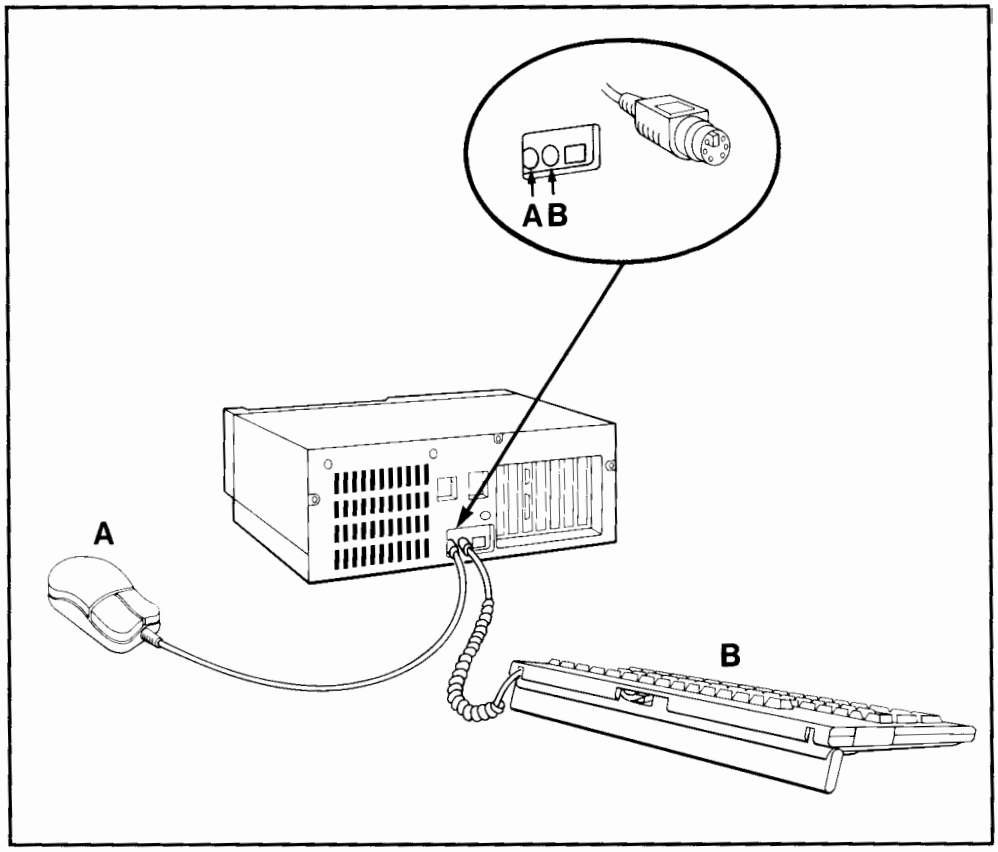
Setup Checklist

Write a check mark in the box ☐ as you complete each step.

☑ 1. **Unpack and gather all the components for your computer.**

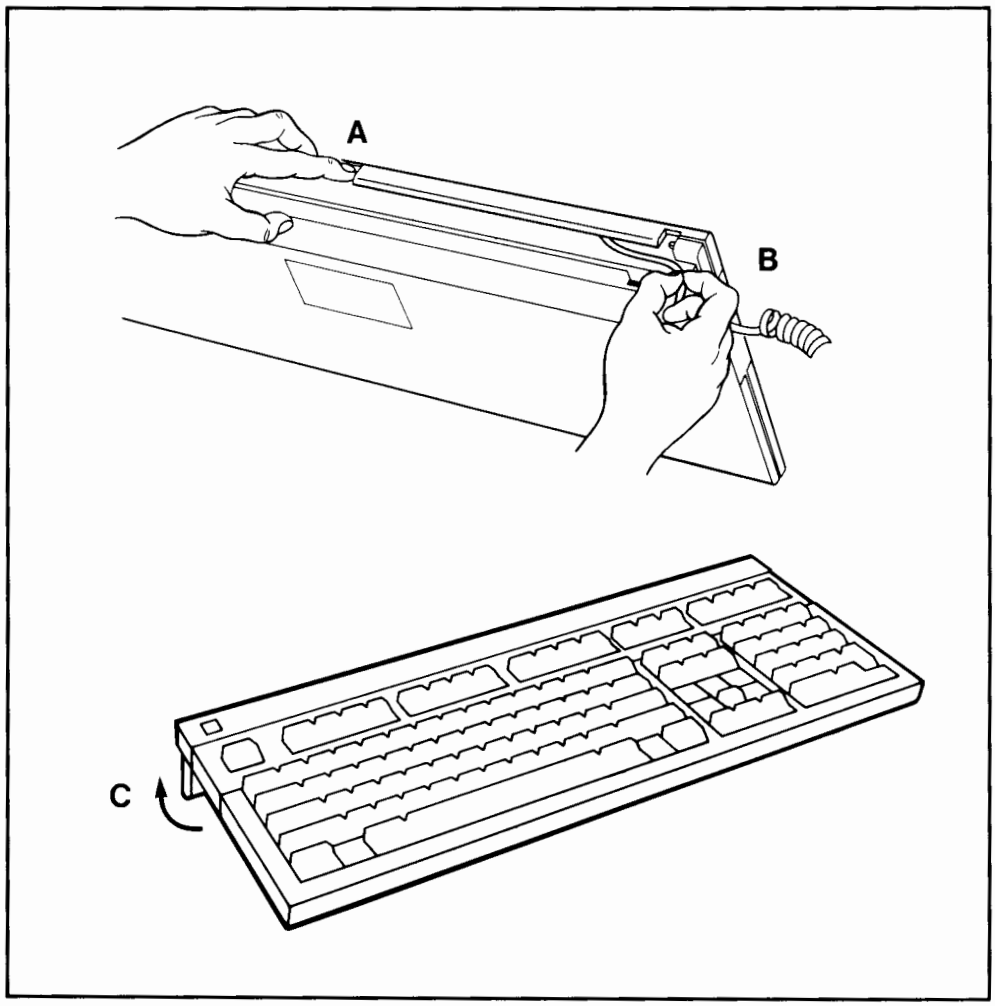


☐ 2. **Connect the mouse if you have one (A). Connect the keyboard (B).**



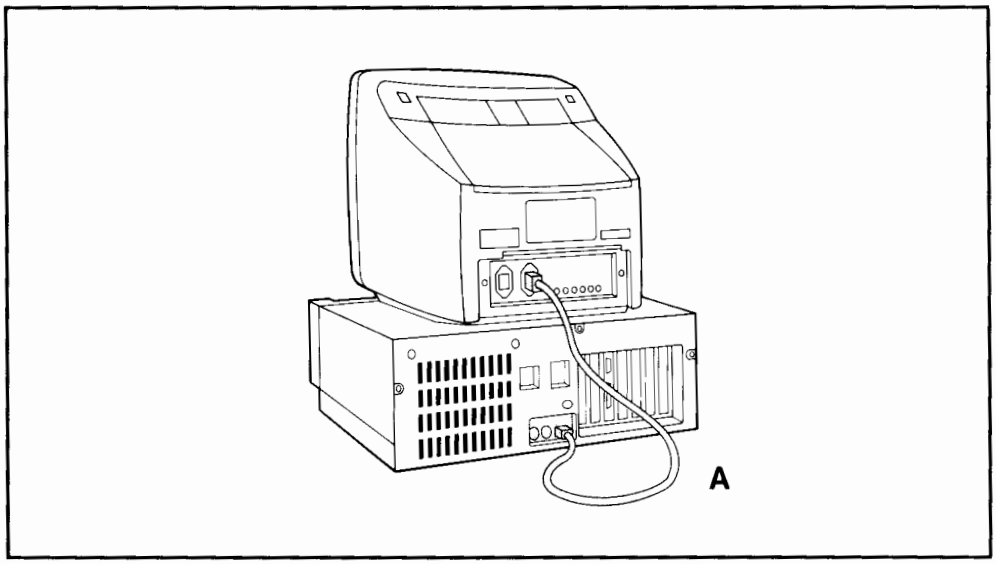
☐ 3. Slide the keyboard cable into either side of the cable retainer (A). Make sure it feeds out of the notch at the end of the cable retainer (B).

Tilt the keyboard to a comfortable angle (C).



☐ 4. **Place the display on top of the computer.**

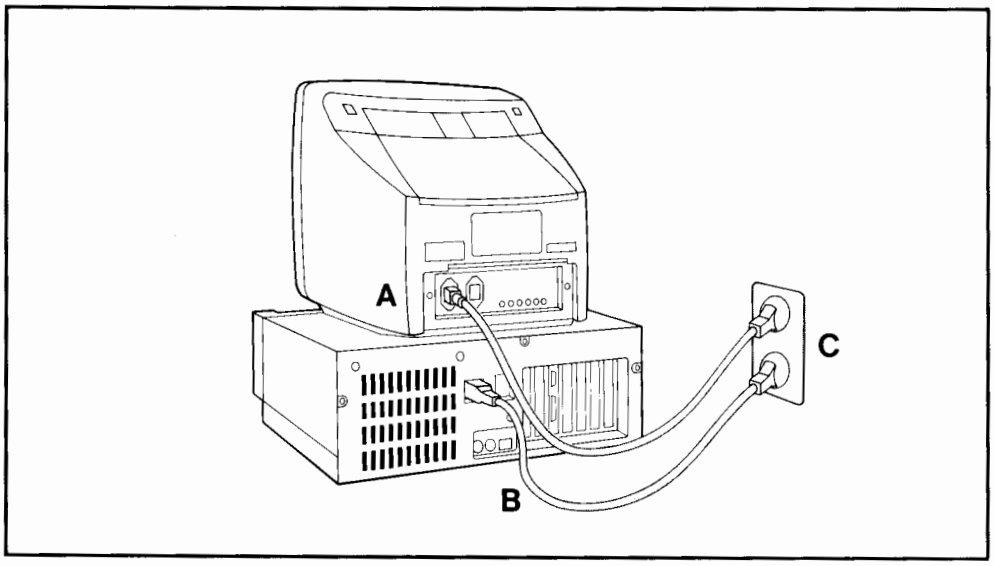
Connect the display video cable (A) to the computer.



Warning

For your safety, the power cords supplied with this computer 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.)

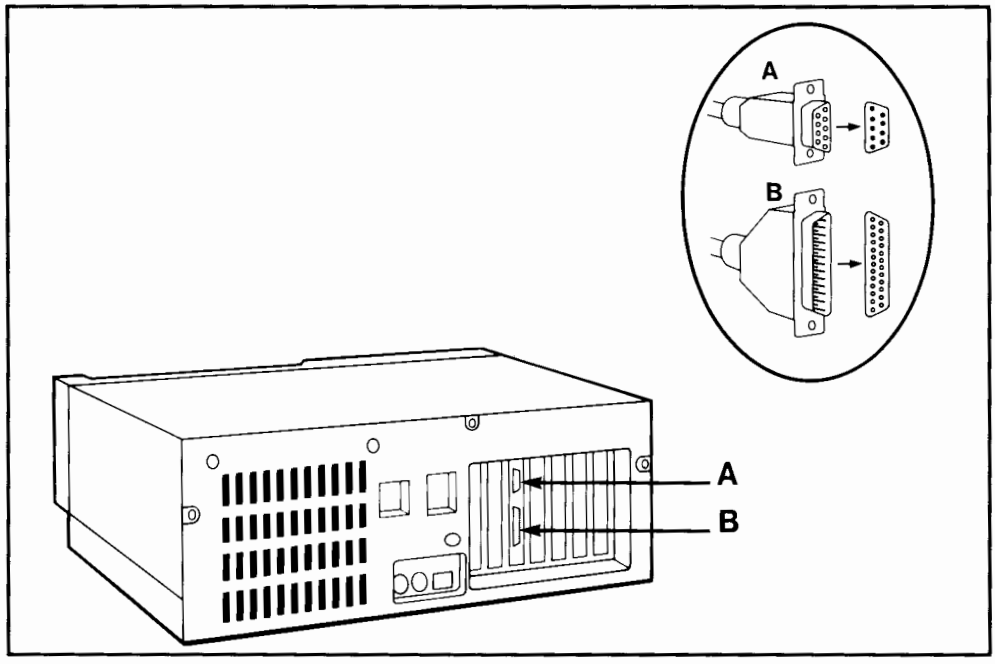
☐ 5. Connect the display (A) and computer (B) power cords to a grounded outlet (C).



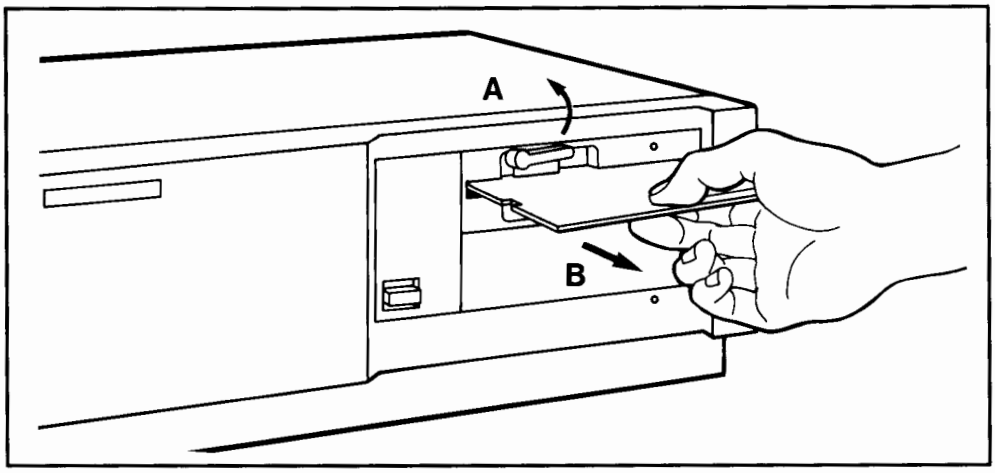
Caution Ensure the power is turned off at the computer and at the printer or plotter before connecting the cables.

☐ 6. **Attach any printer, plotter or other devices to the appropriate 9-pin serial port (A) or 25-pin parallel port (B).**

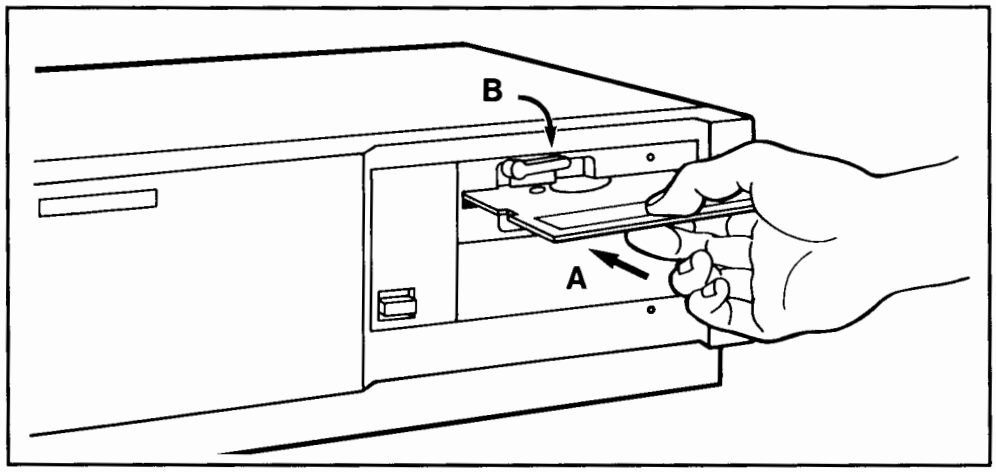
Some serial cables can also have a 25-pin connector. Refer to the instructions that come with that device for special information.



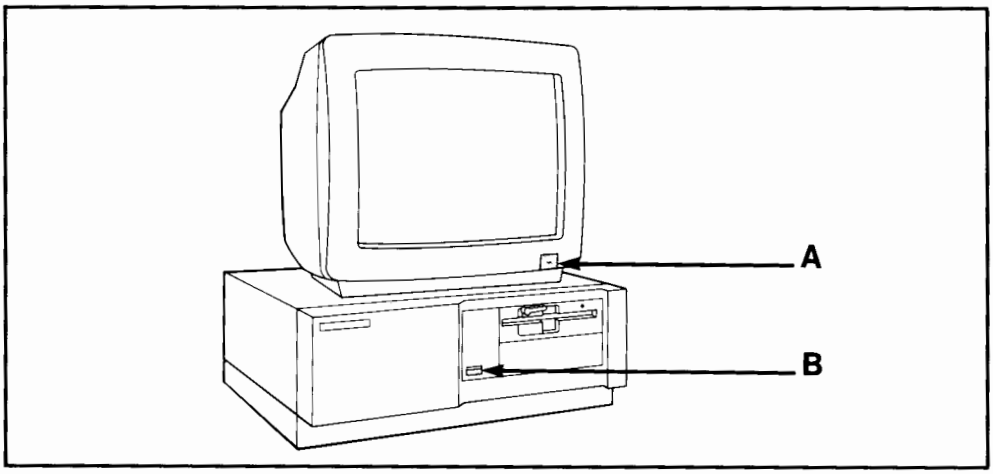
☐ 7. **Remove the cardboard shipping insert from a 5.25-inch flexible drive.**



☐ 8. **Insert the SETUP AND UTILITIES DISK in the top drive (A:).**



☐ 9. **Turn on your display (A) and then your computer (B).**



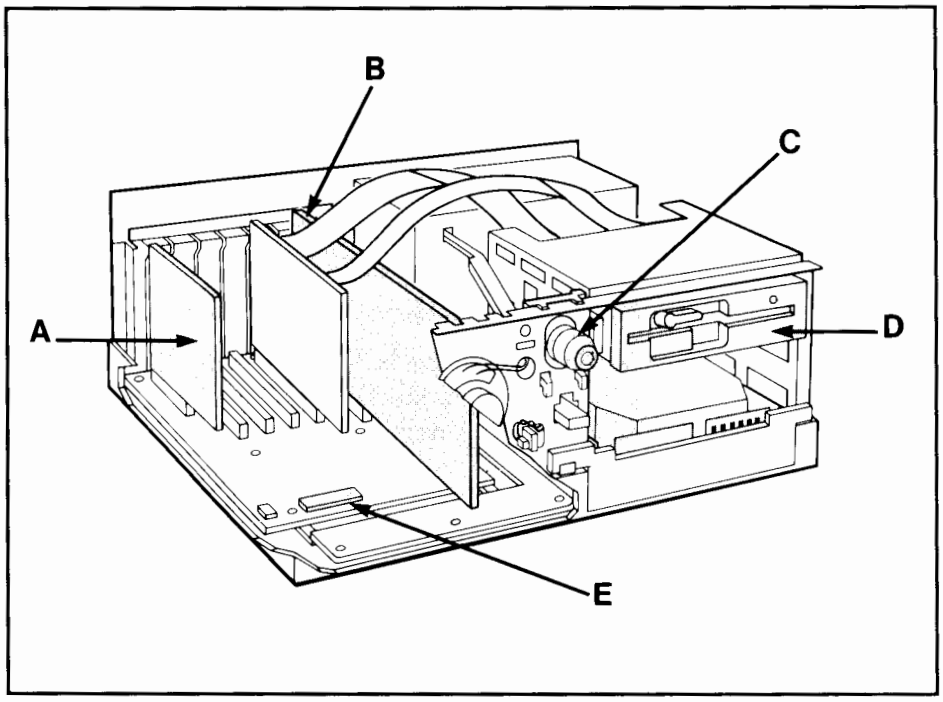
☐ 10. **Check that the computer "beeps" twice and the SETUP menu appears.** This indicates that your HP Vectra 286/12 is functioning correctly.

```
                    Configuration Setup Program

(C) Copyright Hewlett-Packard 1985, 87, 88, 90
(C) Copyright Phoenix Technologies Ltd 1985, 87, 88

1. Set System Configuration
     Date, Time, Memory Size,
     Internal Disk Drive Types,
     Primary Display Characteristics

2. Align Touchscreen

3. Set Password and Network Server Mode

4. Initialize Internal Hard Disk

5. Set Keyboard Options

6. Set Computer Speed

7. Exit

Enter option number and press <Enter>: _
```

Note

If the SETUP menu does not appear, you may have incorrectly installed your computer. Refer to chapter 11, "Troubleshooting and Error Messages."

☐ 11. **Install any extra accessories that you bought.**



☐ A = Accessory boards (refer to chapter 6)
☐ B = Memory Extension Board (refer to chapter 4)
☐ C = Security lock (refer to chapter 3)
☐ D = Disk drives or tape drives (refer to chapter 7)
☐ E = Coprocessor (refer to chapter 5)

Note

Handle accessories carefully and protect them from static electricity.

Leave the accessory in its anti-static bag until you are ready to install it. Use an anti-static wrist strap and grounding mat, such as that provided in the Electrically Conductive Field Service Grounding Kit (HP part number 9300-1155).

☐ 12. **Record the type of accessory, slot and configuration in the "Additional Items Installed" section at the end of this chapter.**

☐ 13. **If you installed extra memory or disk drives, use the SETUP program to configure them.**

Refer to chapter 8 for instructions on using the SETUP program. Return to this checklist when you finish.

☐ 14. **Install your operating system** (refer to the operating system manuals).

☐ 15. **See if there are special instruction in the README file for MS-DOS users.** After you have installed MS-DOS, insert the HP SETUP AND UTILITIES DISK into drive A and enter:

`A:README` Enter

If there are any new instructions (new utilities for example) they will be described on the screen.

☐ 16. **Install the HP Utilities** (refer to chapter 9).

☐ 17. **Install any utilities and drivers provided with your accessories.**

Some printers or plotters may require special drivers. Refer to the manual that came with your accessory for information.

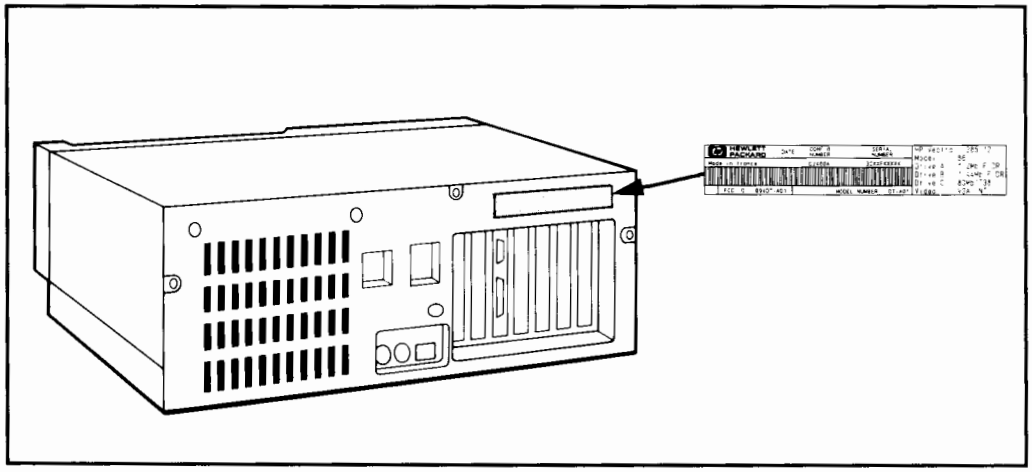
☐ 18. **Install your application software (word processing, spreadsheet, etc).**

Some word processors or graphics programs require their own driver to be installed. See chapter 9 for more information on drivers and utilities.

☐ 19. **Learn to use your computer (refer to chapter 10, "Using Your HP Vectra 286/PC.")**

Factory-Installed Items

The rear of the computer has an identification label that lists the equipment supplied in the computer.



For example:

Drive A: = Flexible disk drive
Drive C: = Hard disk drive and type
Controller = Hard disk drive controller
Memory = Base and extended memory

Additional Items Installed

Slot #	Board Description:	Configuration or Switch Settings:
1		
2		
3		
4		
5	controller board	
6	*(for memory board)*	

Shelf #	Disk Drive:	Capacity/Type:
A:	Flexible	
B:		
C:	Hard	

Coprocessor: _____ **Total Memory (MB):** _____

Security Lock Key Serial Number: _____

Other Items: _____

_____

2

Removing and Replacing the Cover

Removing the Cover

Warning

You may damage the computer or injure yourself if you do not unplug the computer and display power cords before removing the cover.

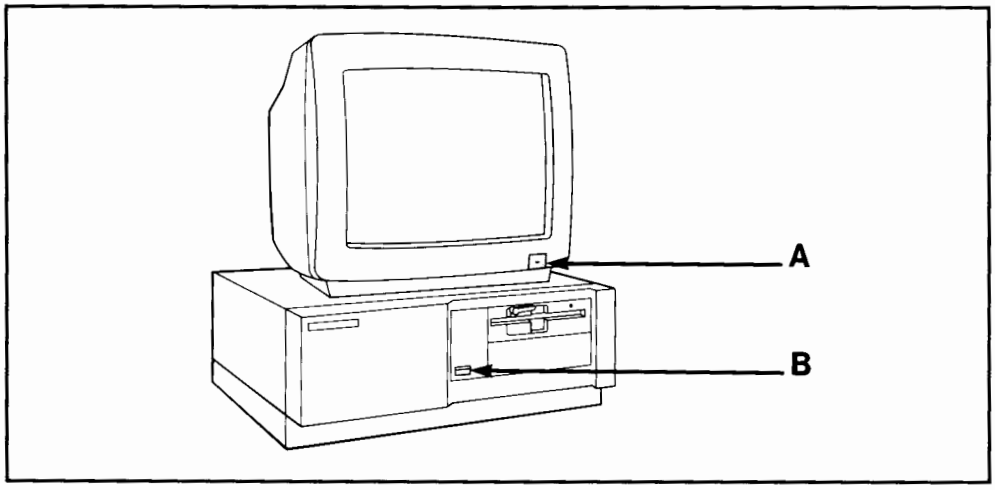
Remove the cover if you need to change the system board switches or if you are installing accessories that go inside the computer:

- Security lock
- Memory
- Coprocessor
- Accessory boards
- Disk/tape drive

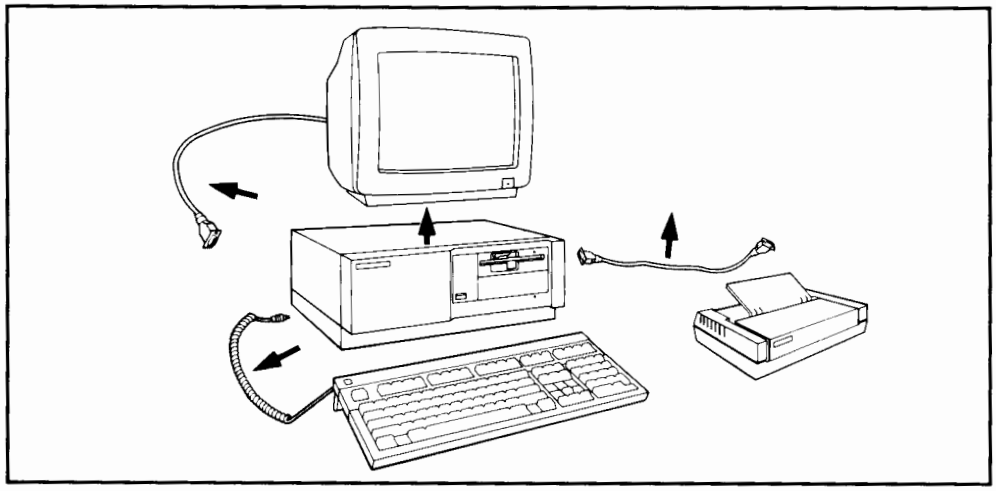
1. **If you have a 20 MB hard disk drive, run the park option of the SETUP program.** Insert the SETUP AND UTILITIES DISK into drive A: and turn on the computer. When the SETUP menu appears, enter:

   /P Enter

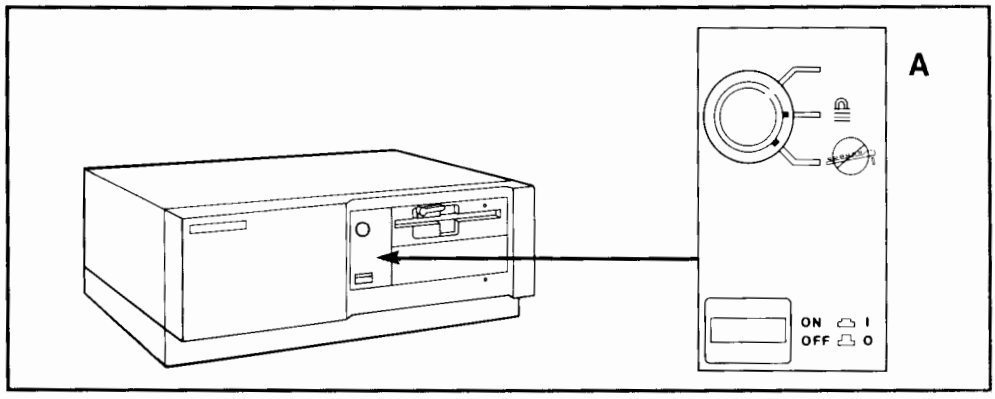
2. If the computer is already set up, turn off the display (A) and the computer (B).



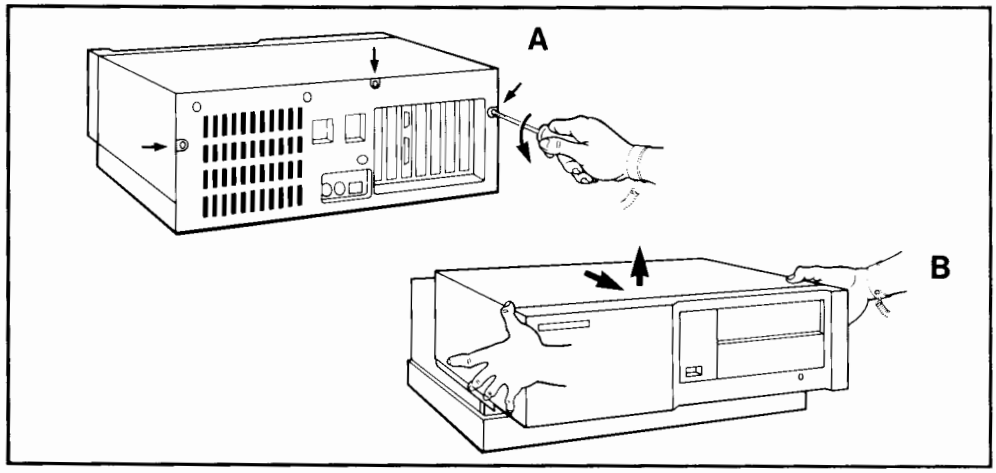
3. Disconnect all cables and power cords.



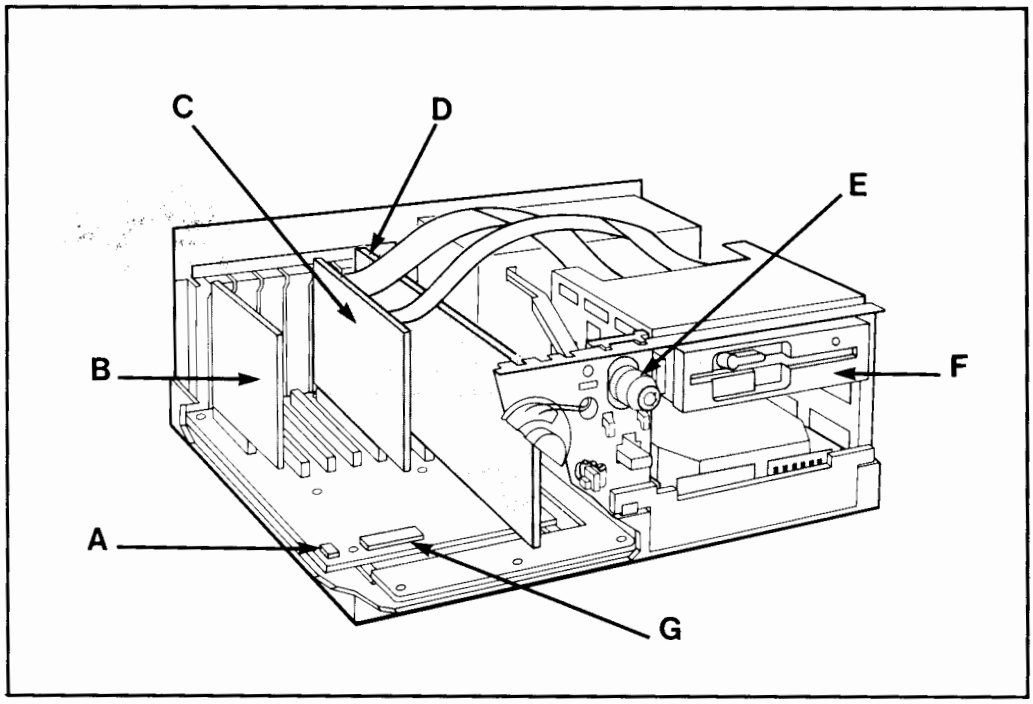
4. **If your computer has a security lock, set it to the "keyboard and cover unlocked" position (A).**



5. **Remove the cover.** Use a flatblade screwdriver to remove the three screws at the rear of the computer (A). *Firmly* slide the cover forward 4 cm (1.5 inches) and lift it off the computer (B).



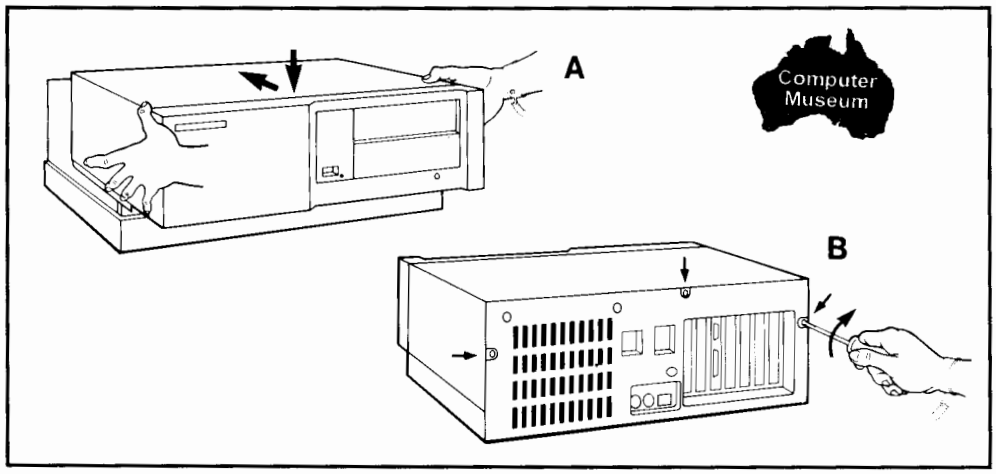
Location of Accessories



A = Switches (refer to appendix A)
B = Accessory boards (refer to chapter 6)
C = Controller board (refer to chapter 7 and appendix A)
D = Memory Extension Board (refer to chapter 4)
E = Security lock (refer to chapter 3)
F = Disk drives or tape drives (refer to chapter 7)
G = Coprocessor (refer to chapter 5)

Replacing the Cover

1. **Check that you do not have any other accessories to install in the computer.**
2. **Replace the cover.** Lower the cover onto the computer, 4 cm (1.5 inches) from the rear panel. *Firmly* slide the cover into place (A). Replace and tighten the screws (B).

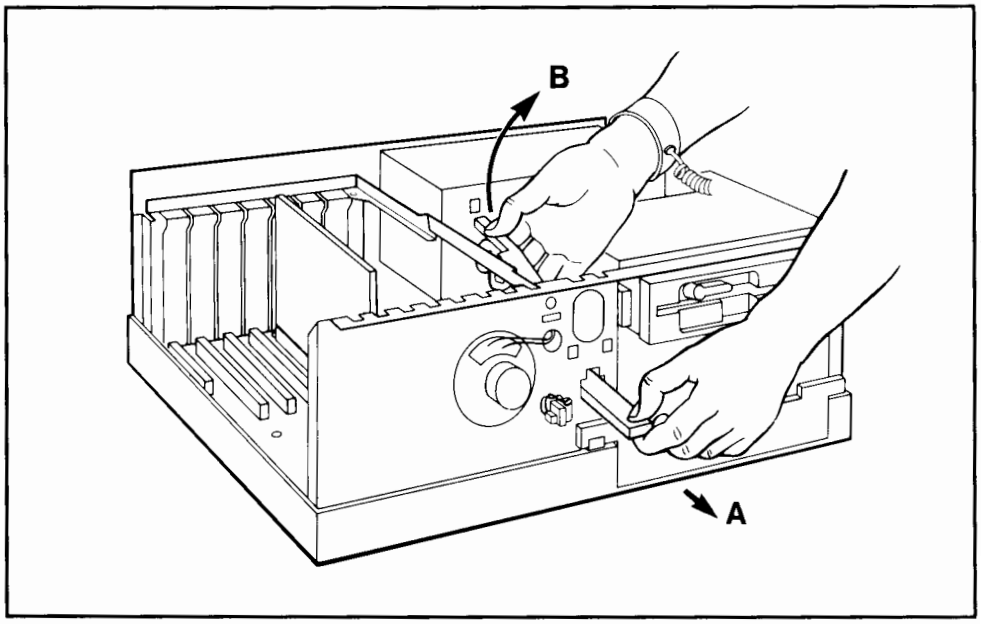


3. **Connect the cables and power cords.** (Refer to chapter 1.)
4. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

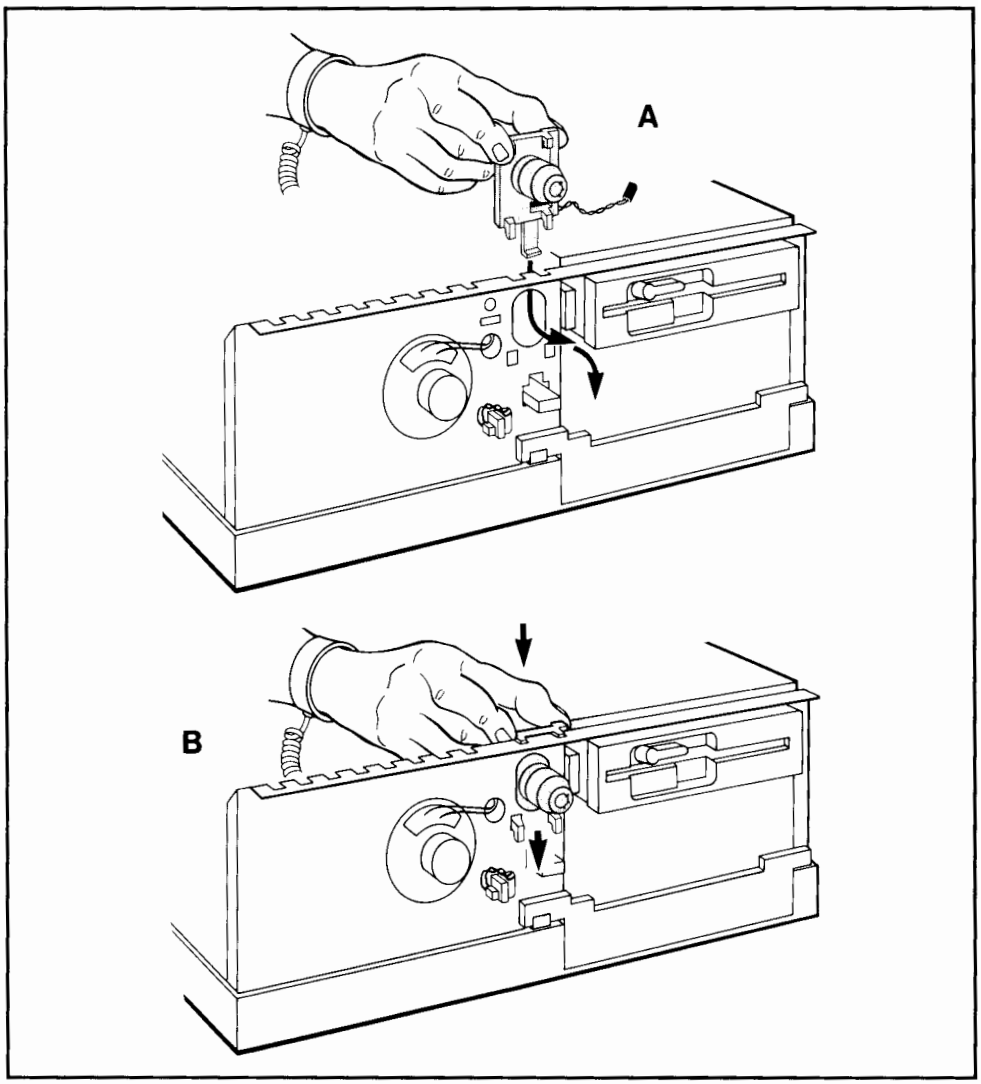
3

Installing a Security Lock

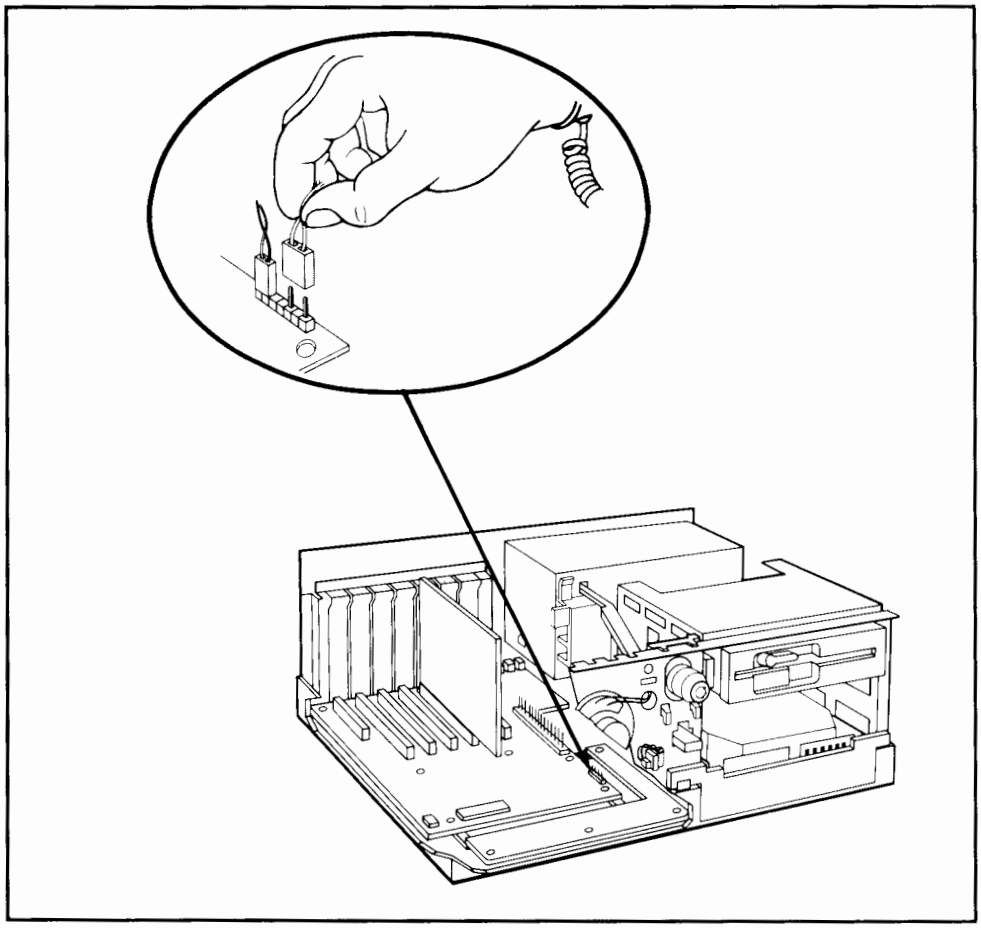
1. **Turn off the computer and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)
3. **Remove the power switch shaft.** *Firmly* pull it out of the power supply (A). Then lift it out toward the rear of the computer (B).



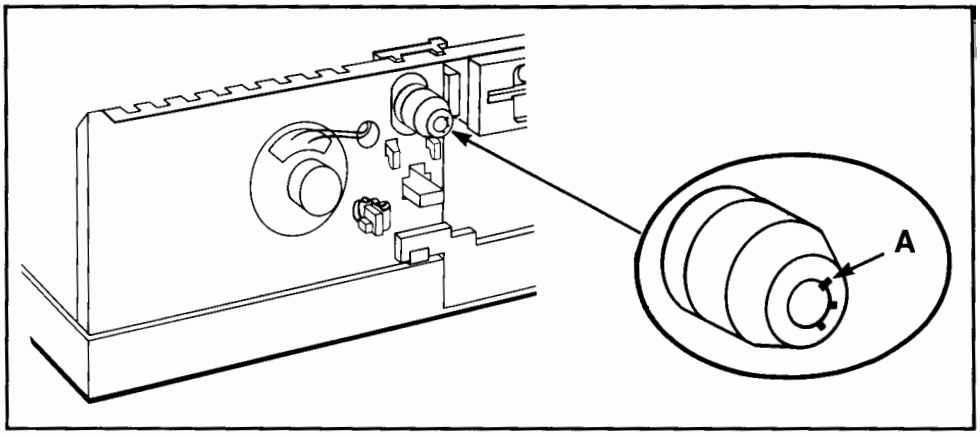
4. **Install the security lock.** From inside the computer, insert the security lock barrel through the computer frame, with the four hook-tabs through their holes in the computer frame (A). *Firmly* press down on the lock assembly (B).



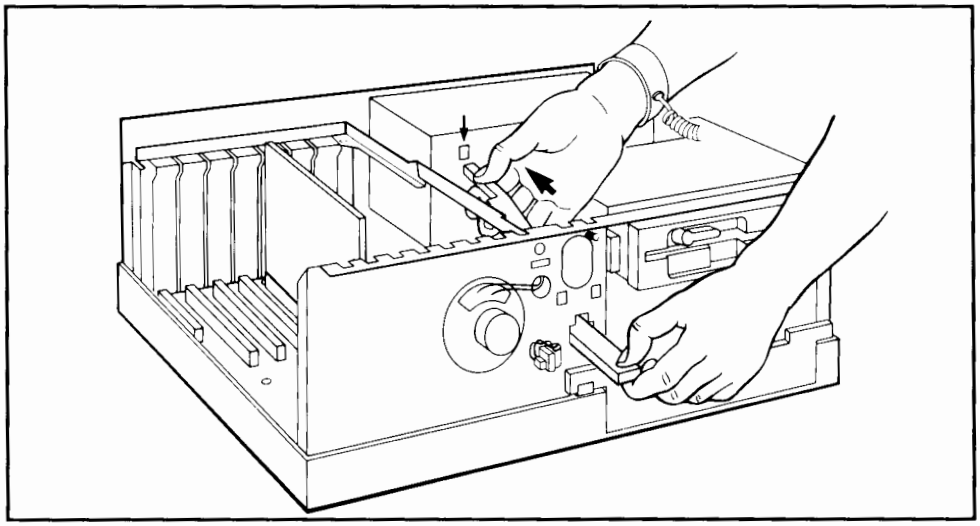
5. **Plug the security lock wire into the connector marked** `"KLOCK"` **on the system board.** (The orientation is not important.)



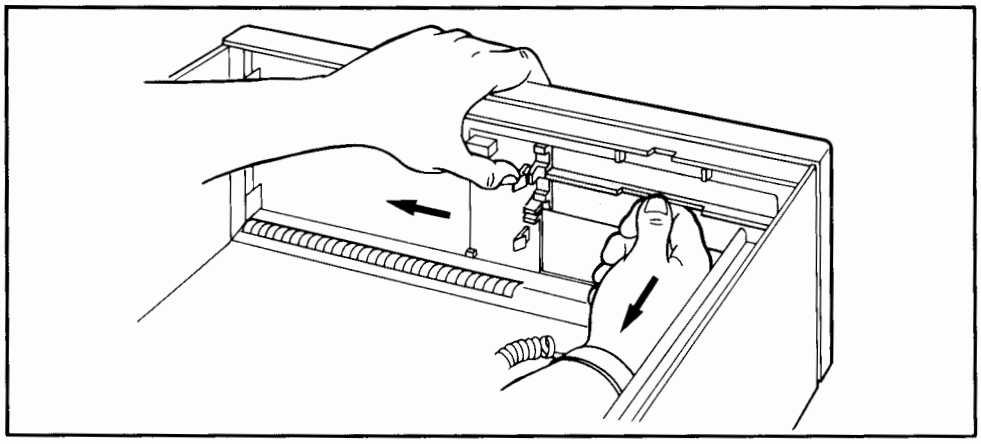
6. **Set the security lock to the "keyboard and cover unlocked" position (A).**



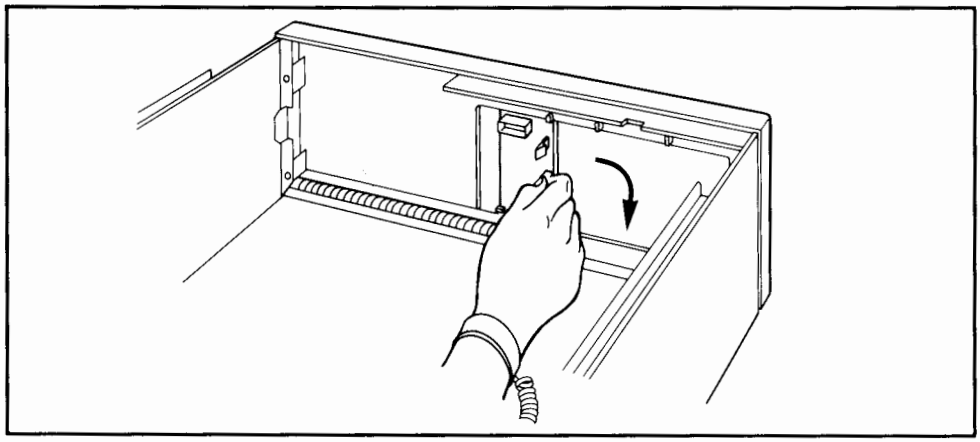
7. **Reinstall the power switch shaft.** Ensure it "clicks" into the power supply.



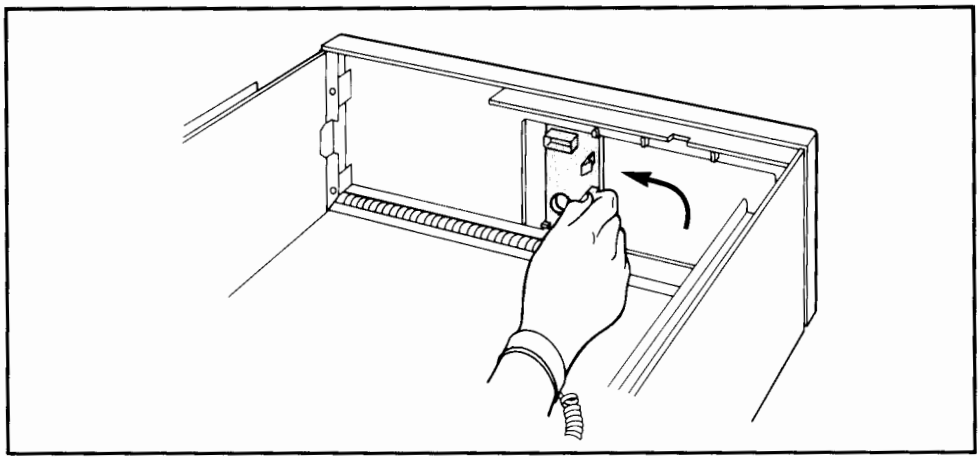
8. **Remove the panel that covers the disk slot in the computer's cover.** Turn the cover upside down. Unclip the locking tab, and lift the panel out.



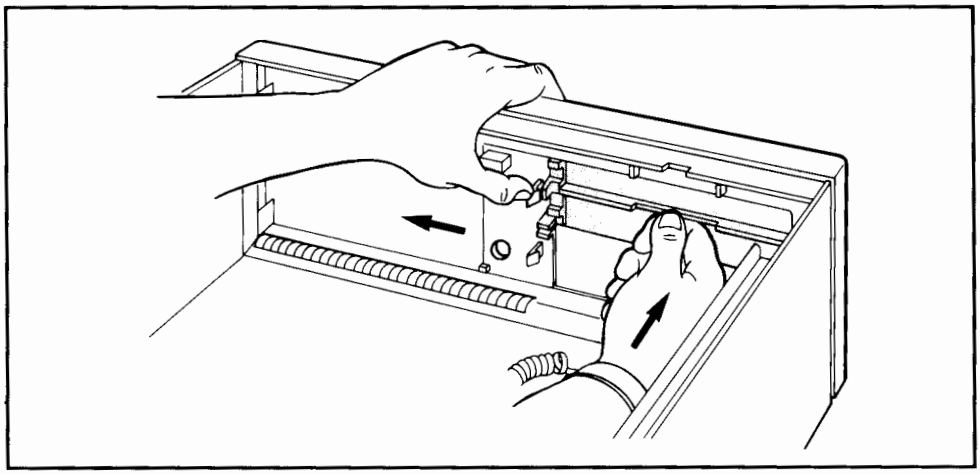
9. **Remove the power button panel from the cover.** *Firmly* pull it across the locking tabs.



10. **Insert the new power button panel in the cover.** *Firmly* push it across the locking tabs.



11. **Replace the panel that covers the disk drive slot in the computer's cover.** Leave the panel out if you are going to install a second flexible disk or tape drive.



12. **Record the key number and keep it and the spare key in a safe place.**

    It is extremely important that you record the serial number of your keys in the "Additional Items Installed" section in chapter 1. If you lose your keys, *you will not be able to order a replacement key for your lock without this serial number.*

Note

If you need another key, send a request for a replacement key (including serial number) and a check for $7 (U.S. funds) to:

Jin Tay Industries Co., Ltd.
P.O. Box 11310 Taipei, Taiwan, R.O.C.
Attention: Key replacement.
Telephone: (Taiwan) 2-903-9350
Facsimile: (Taiwan) 2-902-3039

Allow four weeks for delivery.

---

13. **If you have any other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)
14. **Replace the cover.** (Refer to chapter 2.)
15. **Replace the cables.**
16. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

4

Installing Additional Memory

Caution

Leave the memory modules in their anti-static bag until you are ready to install them. Handle memory modules by the edges only.

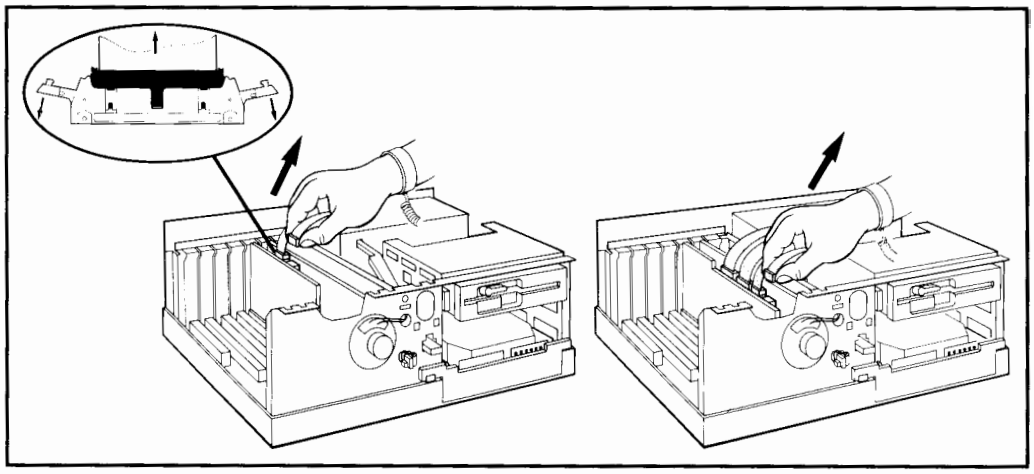
The HP Vectra 286/12 PC has 1 MB of factory-supplied memory. If you buy the Memory Extension Board (HP D2401A), you can install additional memory modules (in pairs) to provide total system memory of 2MB, 3 MB, 5 MB, 6MB, or 8 MB.

To add memory modules, follow the steps below.

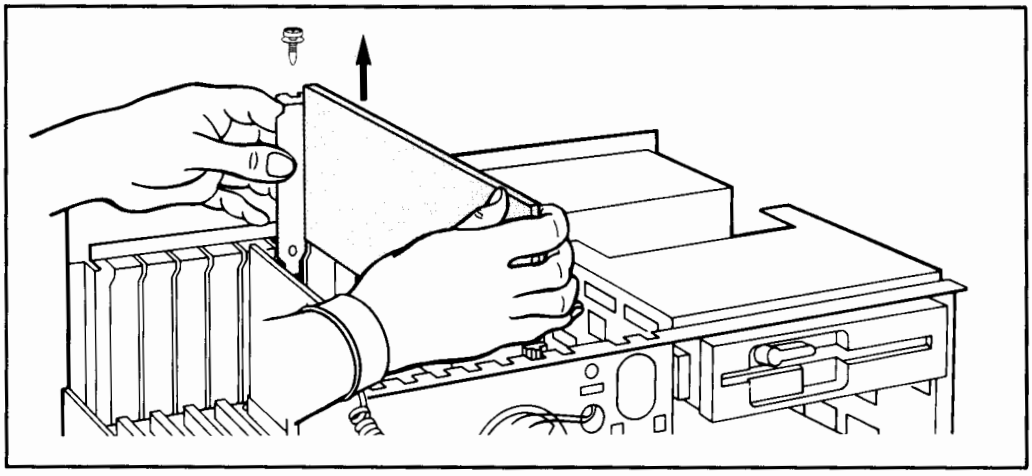
1. **Turn off the computer and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)

3. **If your computer already has a Memory Extension Board (slot 6), remove it.**

   a. Disconnect the cables from the controller board in slot 5. (The board has either two or four sockets.)

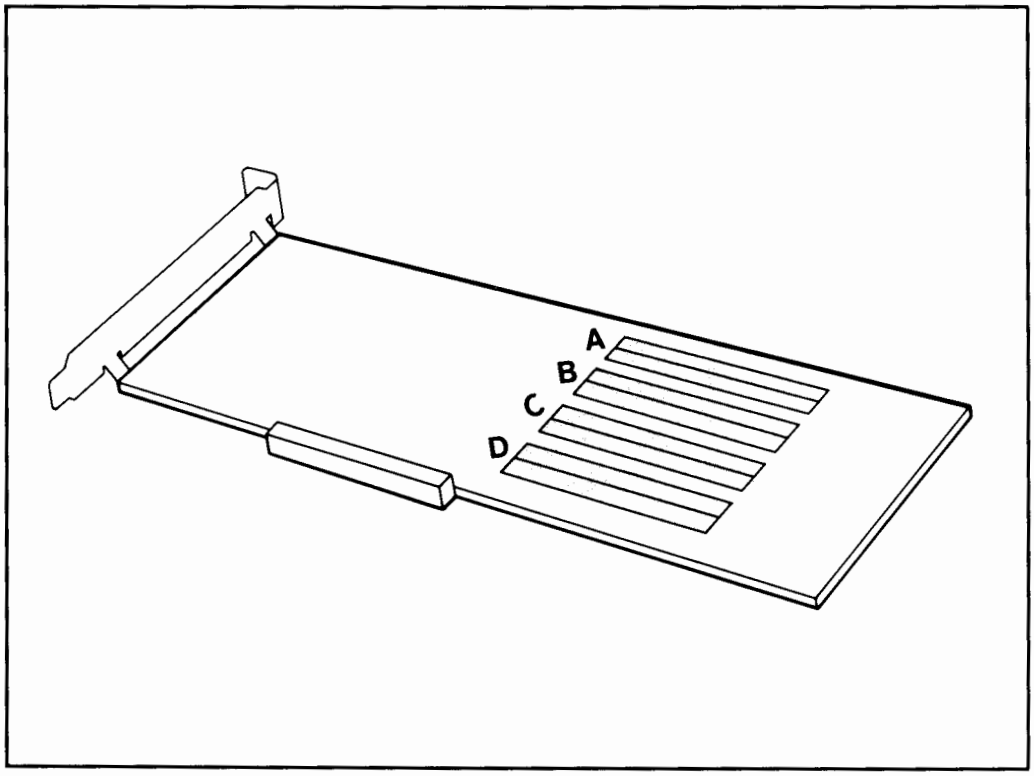


   b. Unscrew and remove the Memory Extension Board from slot 6.

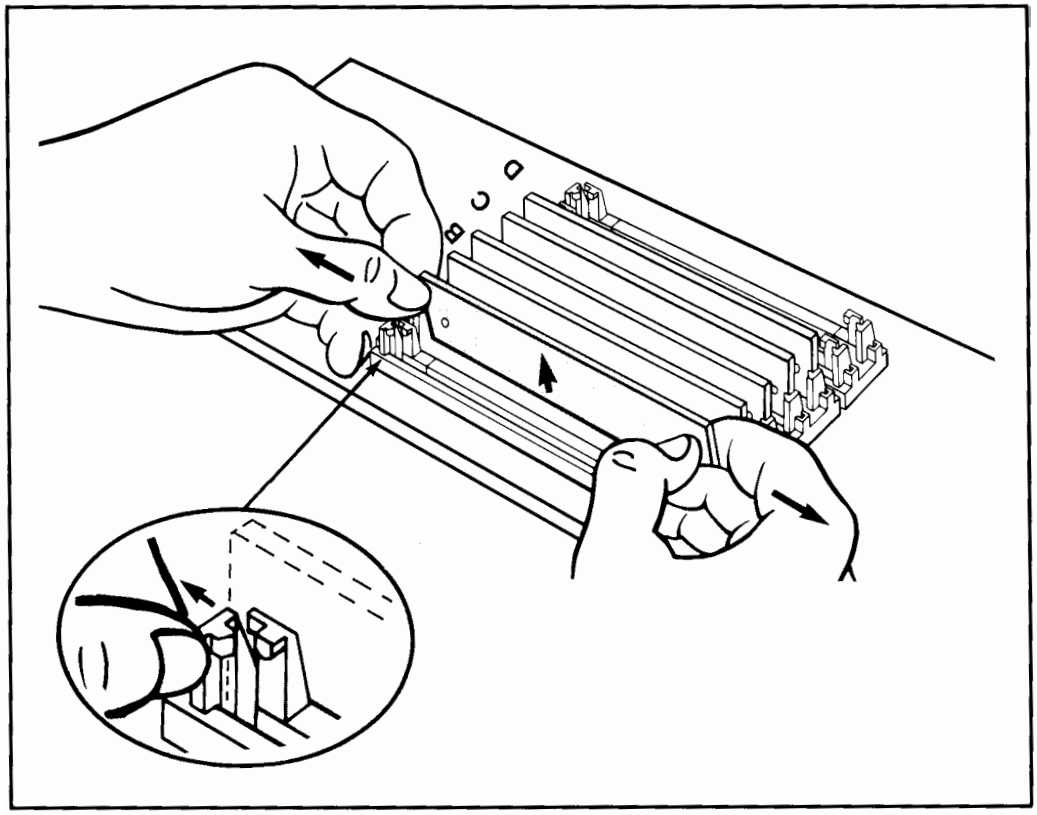


4. **Locate the memory sockets on the Memory Extension Board.**

   The Memory Extension Board has eight memory sockets. Each pair of sockets (labeled A, B, C, and D) form a "bank."



5. **Remove existing memory modules before beginning the installation.**
   a. *Firmly* pull the plastic guide outward from both sides of the module.
   b. Pivot the module forward 45° and lift it out.



6. **Identify the memory sockets to use.**

   The system board has 1 MB of memory. TOTAL MEMORY is the memory on the system board plus the memory you add to the Memory Extension Board. For 6 MB and 8 MB, the original 1 MB module on the system board is ignored (that is, total memory is the memory on the Memory Extension Board only).

Where to Install Memory Modules

For a TOTAL MEMORY of:	Install Memory Modules in These Banks *				Using These Upgrade Kits:
	A	B	C	D	
2 MB			Two 256 KB modules	Two 256 KB modules	One 1 MB kit (D1640A)
3 MB			Two 1 MB modules		One 2 MB kit (D1354A)
5 MB			Two 1 MB modules	Two 1 MB modules	Two 2 MB kits (D1354A)
6 MB	Two 1 MB modules	Two 1 MB modules	Two 1 MB modules		Three 2 MB kits (D1354A)
8 MB	Two 1 MB modules	Two 1 MB modules	Two 1 MB modules	Two 1 MB modules	Four 2 MB kits (D1354A)

* Note that each bank has two sockets.

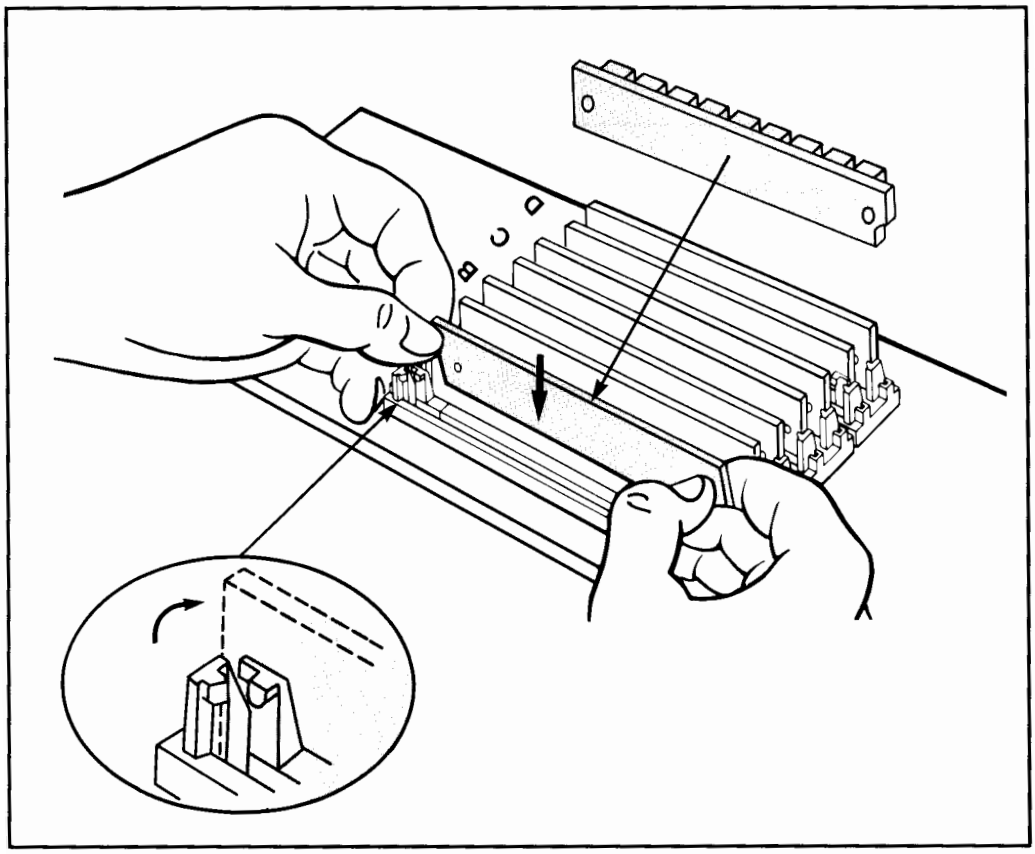
7. **Install the new memory modules into the sockets listed in "Where to Install Memory Modules".**

   a. Slide the memory module into the socket at 45°.

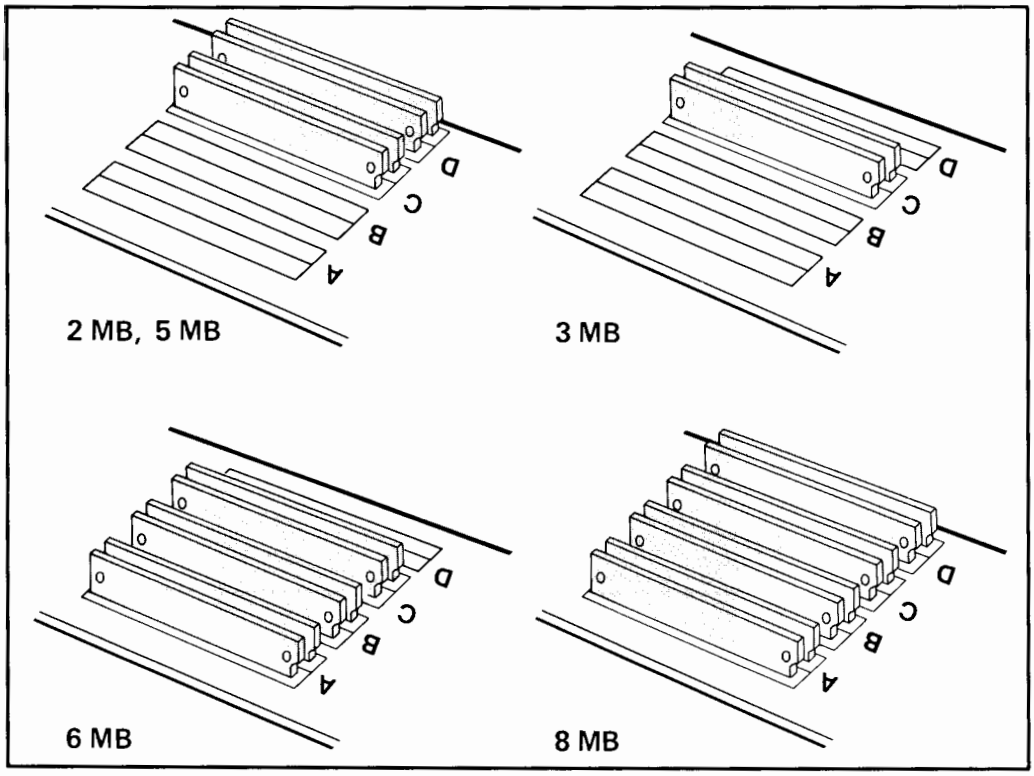
   b. Press down firmly on the memory module so that its connector *completely* engages with the socket.

   c. Pivot the memory module to the vertical position.

   If the memory module does not "click" into place, do not force it, but repeat steps 7a, 7b and 7c again.



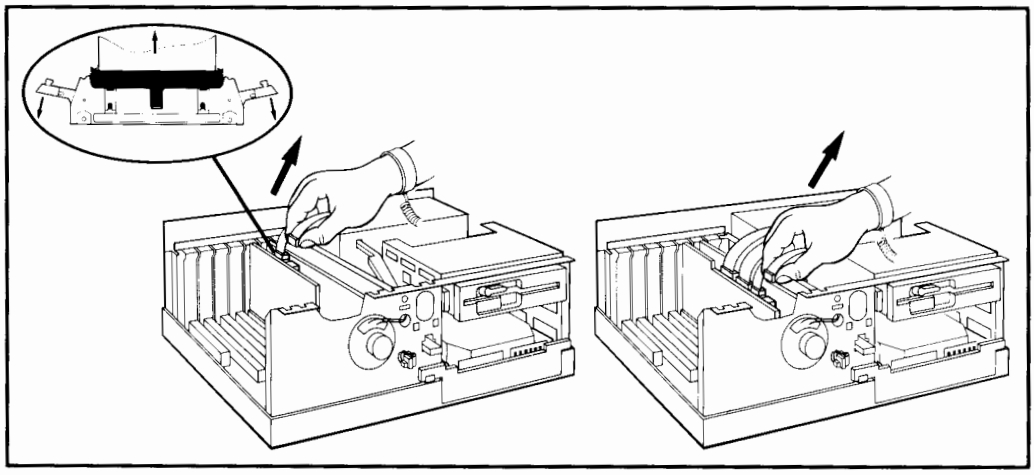
Make sure the memory modules are installed as shown below.



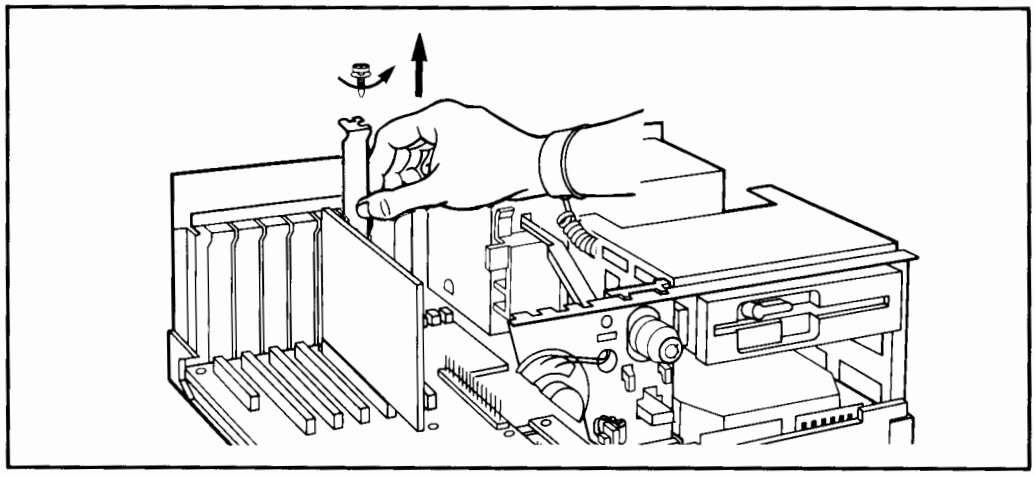
2 MB = 2 megabytes of total memory
3 MB = 3 megabytes of total memory
5 MB = 5 megabytes of total memory
6 MB = 6 megabytes of total memory
8 MB = 8 megabytes of total memory

8. **If your computer did NOT already have a Memory Extension Board (slot 6), prepare the slot:**

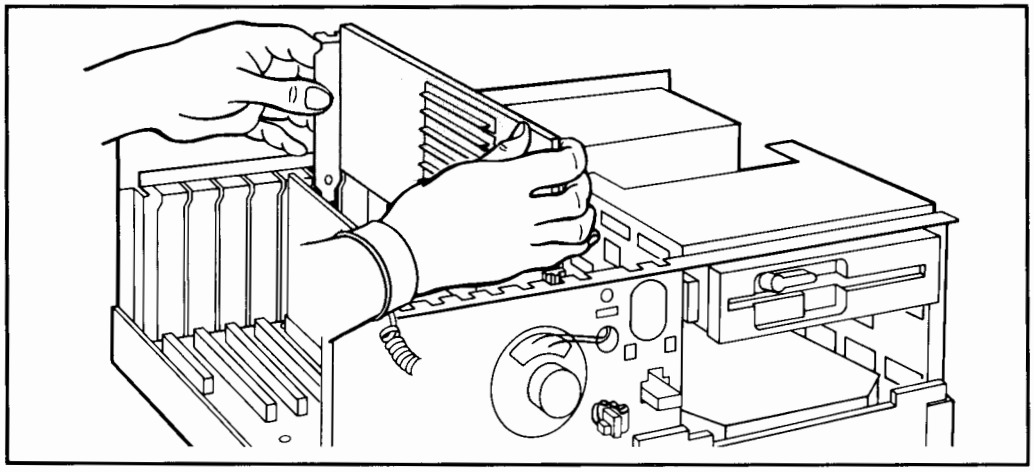
   a. Disconnect the cables from the controller board in slot 5. (The board can have two or four sockets.)



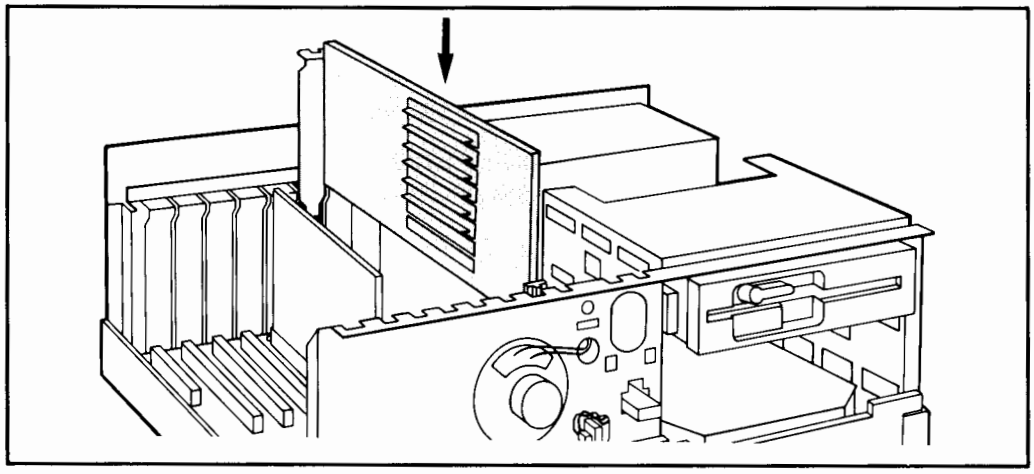
   b. Locate slot 6. Unscrew and remove the slot cover.



9. **Ensure you have correctly installed the memory modules.**
10. **Hold the Memory Extension Board by its top edge. Slide it into slot 6.** Keep the board *horizontal.*



11. **Firmly press down on the board.** Ensure the board's connector engages *completely* with the slot.

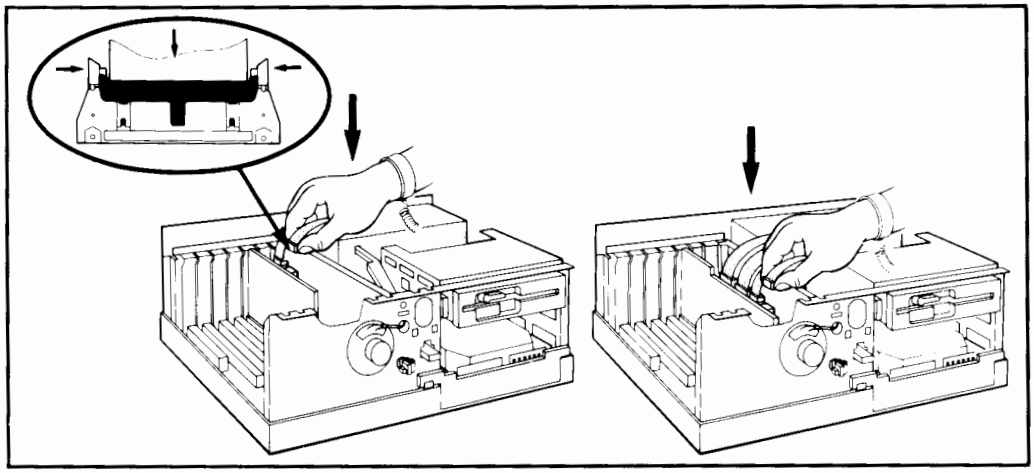


12. **Secure the board by replacing the slot cover screw.**

13. **Re-connect the cables to the controller board in slot 5.**

    If the controller board has two sockets, then A = flexible disk cable, B = hard disk cable.

    If the controller board has four sockets, then A = flexible disk cable, B = hard disk control cable, C = first hard disk data cable, D = optional second hard disk data cable.



14. **Turn to the "Additional Items Installed" section in chapter 1.** Record the board's name and amount of memory on the line provided.

15. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)

16. **Replace the cover.** (Refer to chapter 2.)

17. **Replace the cables.**

18. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

    Remember to run the SETUP program and declare the new memory. (Refer to chapter 8).

    Additional memory is declared in the SETUP program as *extended memory.* Refer to the documentation that came with your application software for the type of memory it uses. If your software requires *expanded memory,* use the HP utility HPEMM.SYS to convert extended memory to expanded memory (refer to chapter 9).

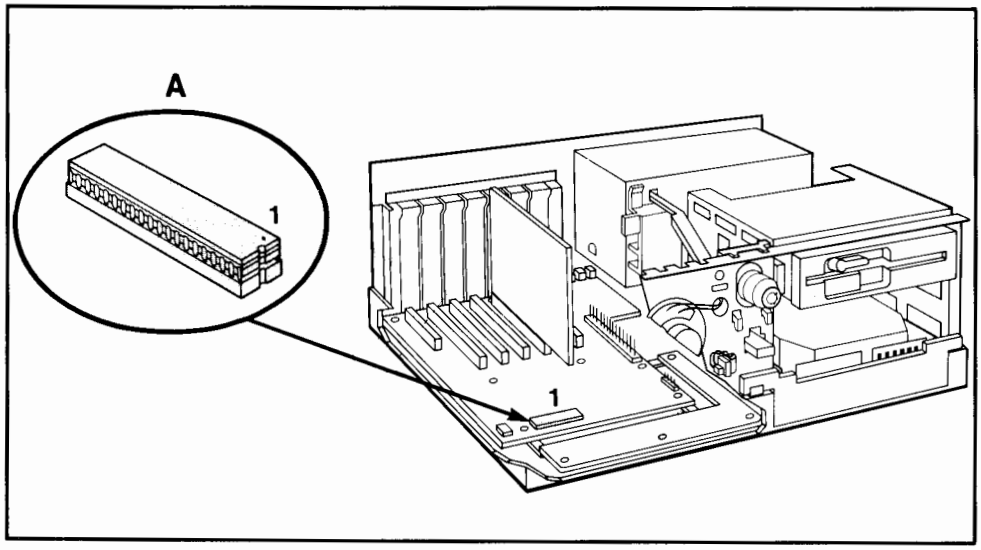
5

Installing a Coprocessor

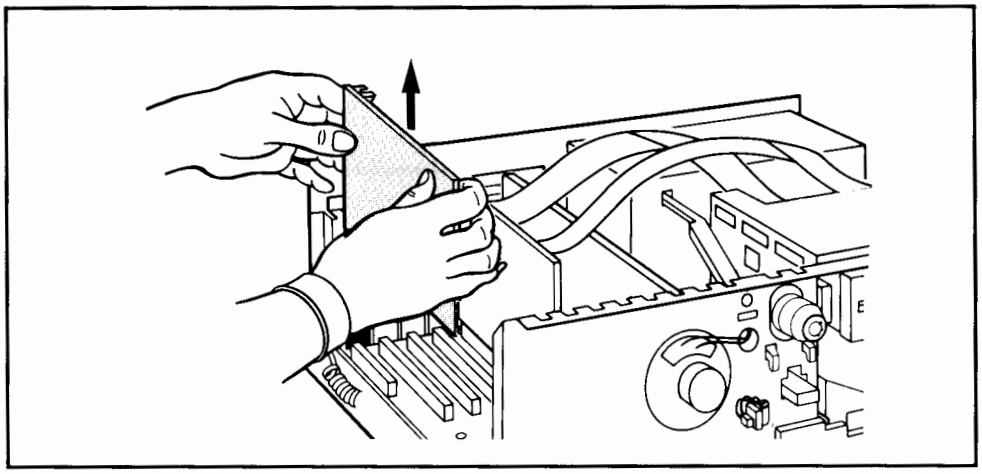
Caution

Leave the coprocessor in its anti-static bag until you are ready to install it. Handle the coprocessor by the edges only.
If you do not feel confident installing the coprocessor yourself, contact your HP Dealer for assistance.

1. **Turn off the computer and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)
3. **Locate the coprocessor socket on the system board (A).**



4. **If a board is blocking access to the socket, unscrew and remove the board.**



5. **Prepare the coprocessor.**

   The pins on the coprocessor may be bent at an angle that will not line up with the holes in the coprocessor socket. (Refer to A in the figure opposite.)

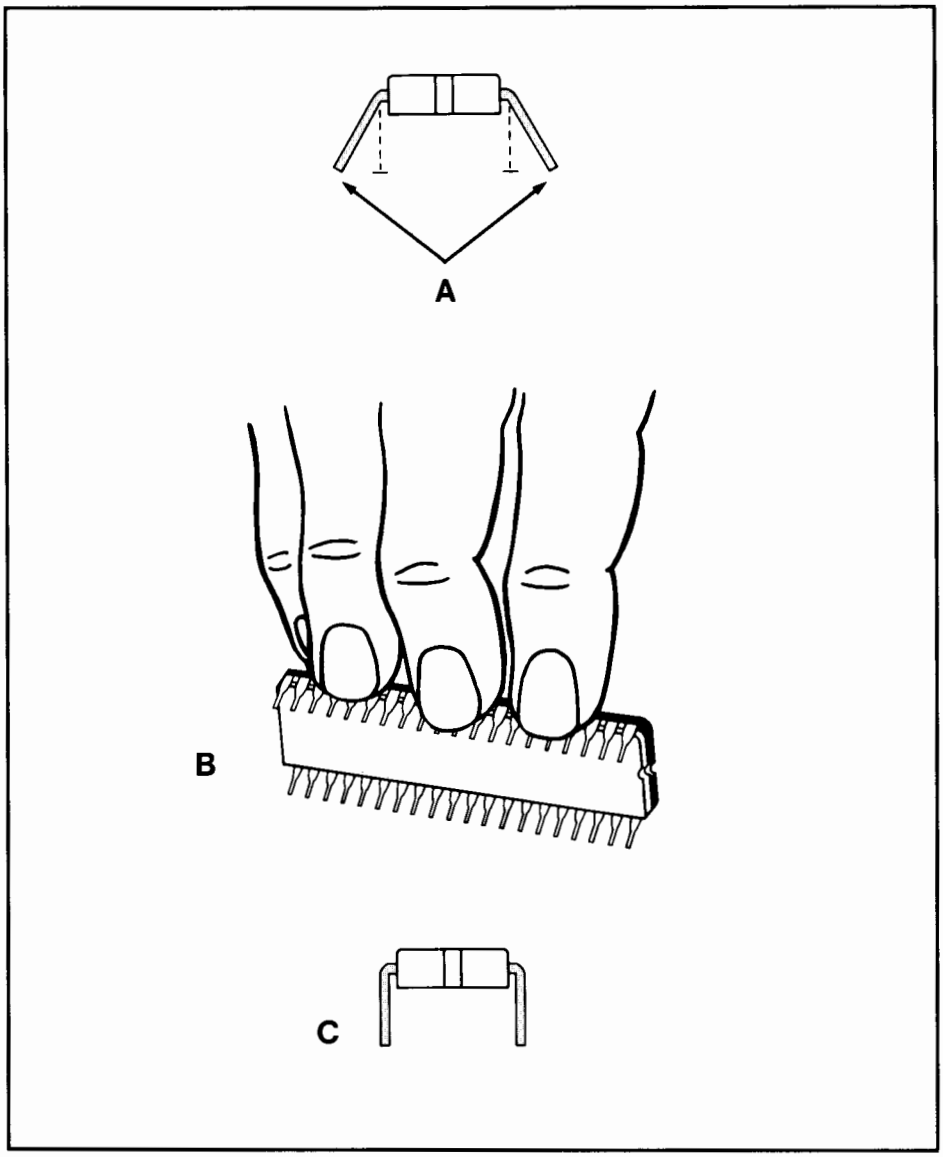
   Follow these steps to straighten the pins of the coprocessor:

   a. Hold the coprocessor in one hand and touch your work surface with your other hand. This prevents static damage from the work surface to the coprocessor.

   b. Lay the coprocessor on its side and roll it very carefully toward the pins to straighten them. (Refer to B in the figure opposite.)

   c. Repeat for the other side.

      The coprocessor should now look like C in the figure opposite.

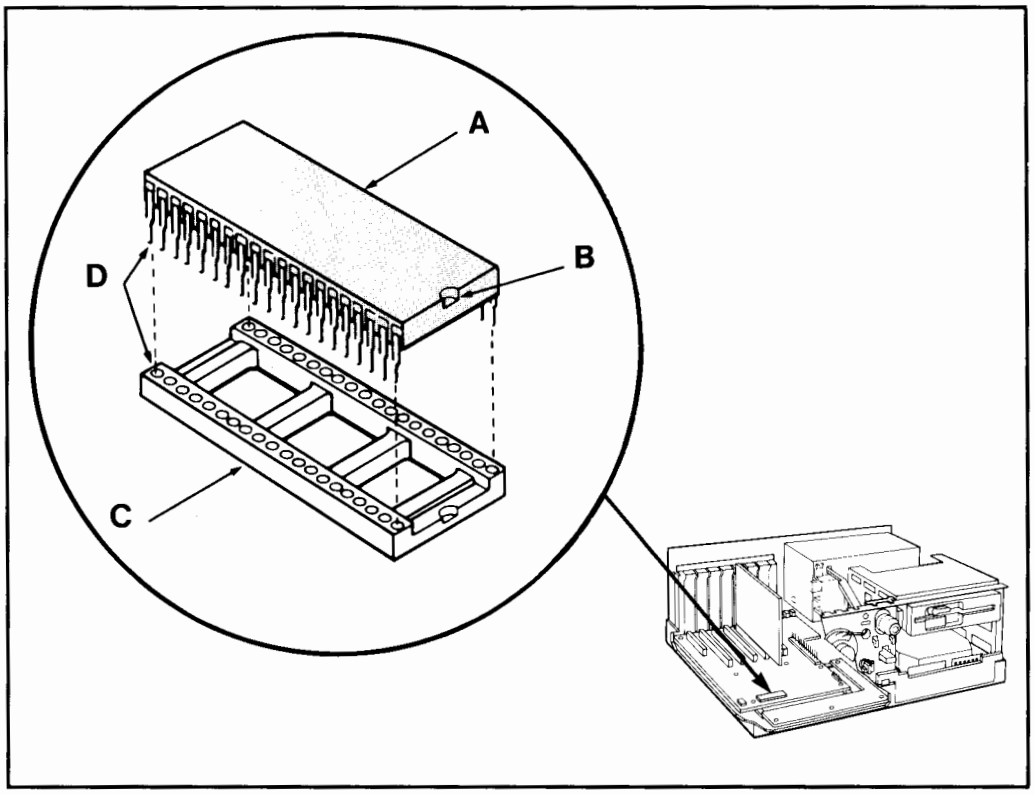


Straightening the Pins of the Coprocessor

6. **Install the coprocessor.**

   a. Hold the coprocessor with one hand and touch the metal case of the computer with the other hand. This will equalize the static electricity between your computer and the coprocessor.

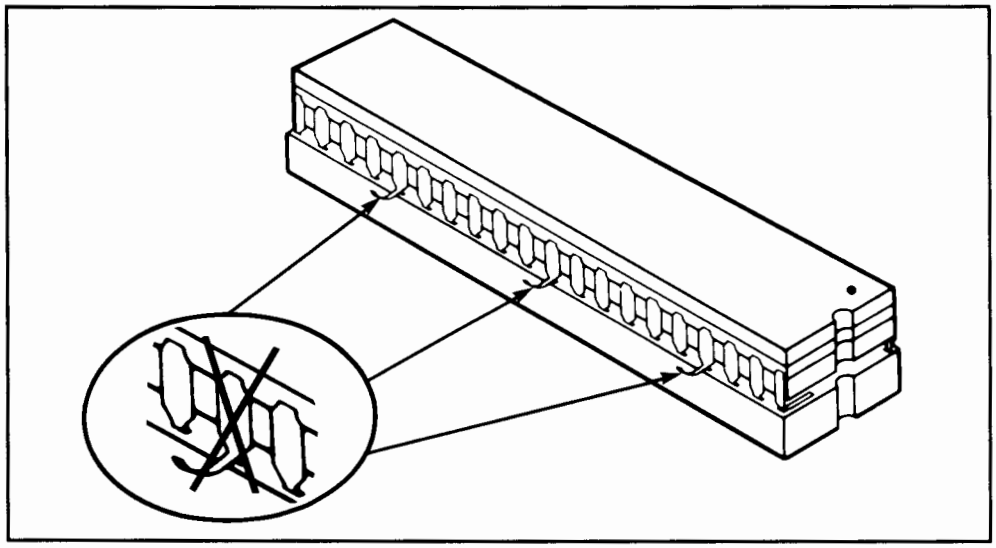
   b. Position the coprocessor (A) over the coprocessor socket (C) with the index mark (B) positioned correctly (a white dot on the system board indicates the location of the coprocessor's pin 1). Also make sure that all pins (D) are aligned with the socket.



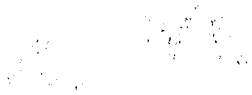
   c. *Firmly* press the coprocessor evenly into the socket.

7. **Check that the pins are correctly seated in the socket.**

   A pin can become bent under the coprocessor while appearing to be correctly seated in its socket. If a malfunction occurs, examine the coprocessor to be certain that all pins are correctly inserted. If necessary, use an IC removal tool to remove and reinstall the coprocessor.



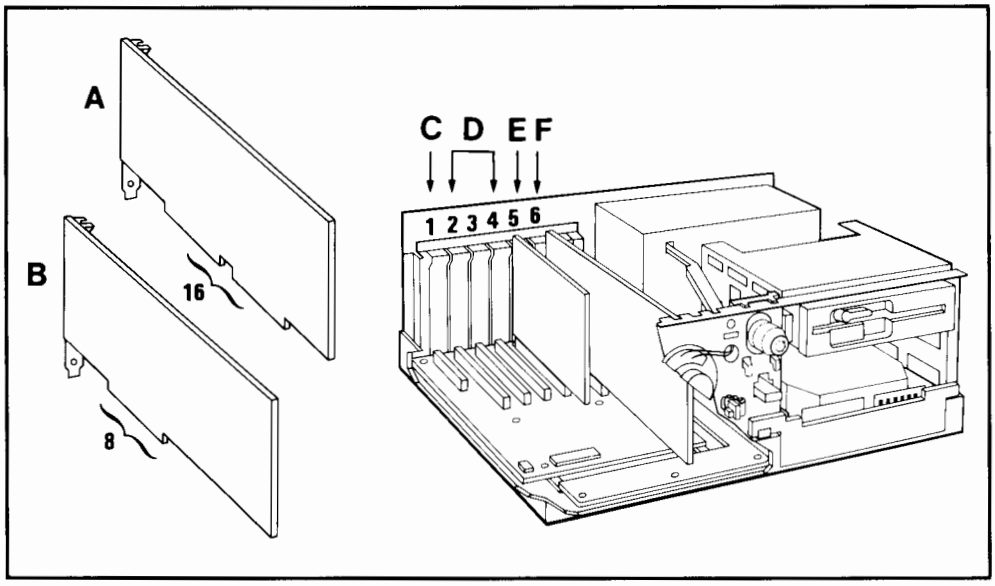
8. **Replace any boards you removed to gain access to the coprocessor socket.** (Refer to chapter 6.)
9. **Turn to the "Additional Items Installed" section in chapter 1.** Record the coprocessor's speed in MHz (12) on the line provided.
10. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)
11. **Replace the cover.** (Refer to chapter 2.)
12. **Replace the cables.**
13. **If you are setting the computer up for the first time, return to the setup checklist in chapter 1.**



6

Installing Accessory Boards

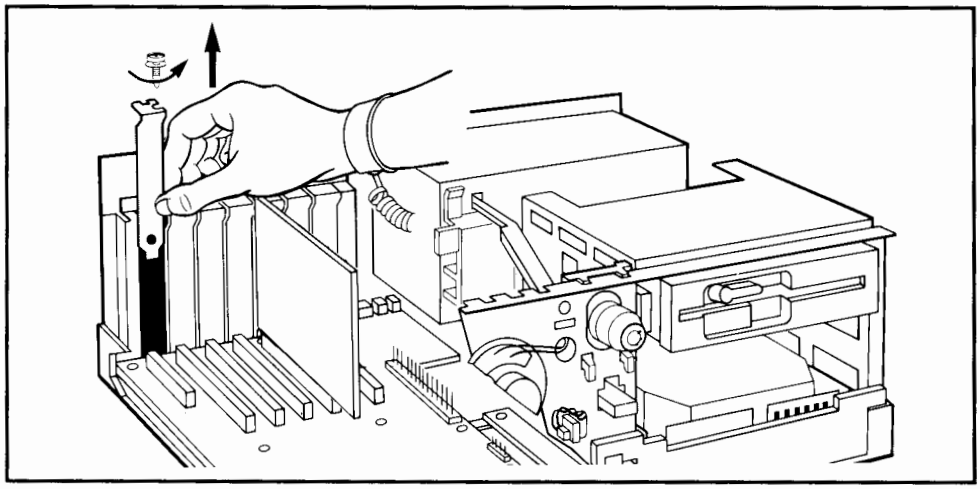
Where to Install Boards



A = Example of an 16-bit accessory board
B = Example of an 8-bit accessory board
C = Slot 1 for 8-bit accessory board
D = Slots 2 to 4, for 8- or 16-bit accessory boards
E = Slot 5, controller board (embedded-AT version shown)
F = Slot 6, HP Memory Extension Board (optional)

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

1. **Turn off the power and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)
3. **Identify a free slot to use.** Unscrew and remove the slot cover.



4. **If necessary, set any switches or jumpers on the accessory board.** Refer to the manual that came with the board.

   Make sure that the board does not use the same configuration as any other board installed in the computer.

   For example, if you are installing boards that use a serial or parallel port, make sure they do not use COM1 or LPT1. Alternatively, change the controller board's configuration as described in appendix A.

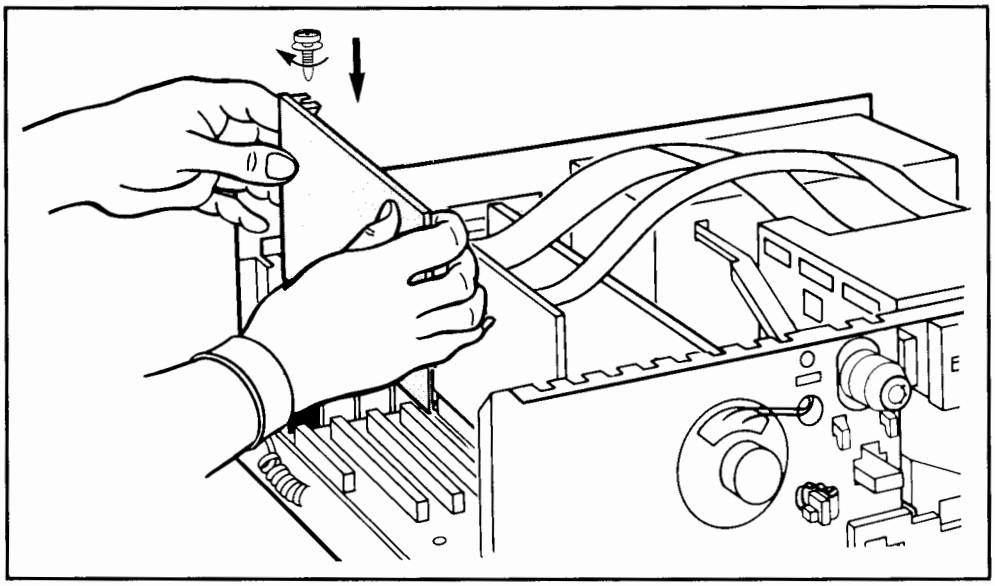
Note

If you are installing a Video Board in order to replace the built-in VGA, refer to "The System Board Switches" section of appendix A, "Computer Specifications" for information on switch settings.

5. **Hold the board horizontal by the top edge. Slide it into the chosen slot.**

   Firmly press down on the board. Ensure the board's connector engages *completely* with the slot.

   Secure the board by replacing the slot cover screw.



6. **Turn to the "Additional Items Installed" section in chapter 1.** Record the board name and configuration on one of the lines provided.
7. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)

8. **Replace the cover.** (Refer to chapter 2.)
9. **Replace the cables.**
10. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

    If you have installed a memory board, video board or disk controller board, run the SETUP program. (Refer to chapter 8).

7

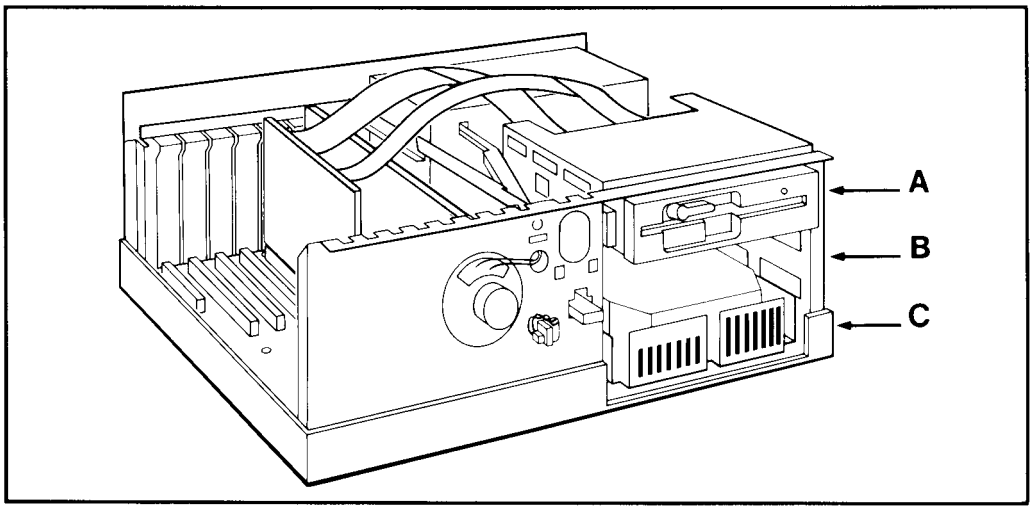
Installing and Removing Hard Disk, Flexible Disk or Tape Drives

Where to Install Drives

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 drive or tape drive, install it in the middle shelf.



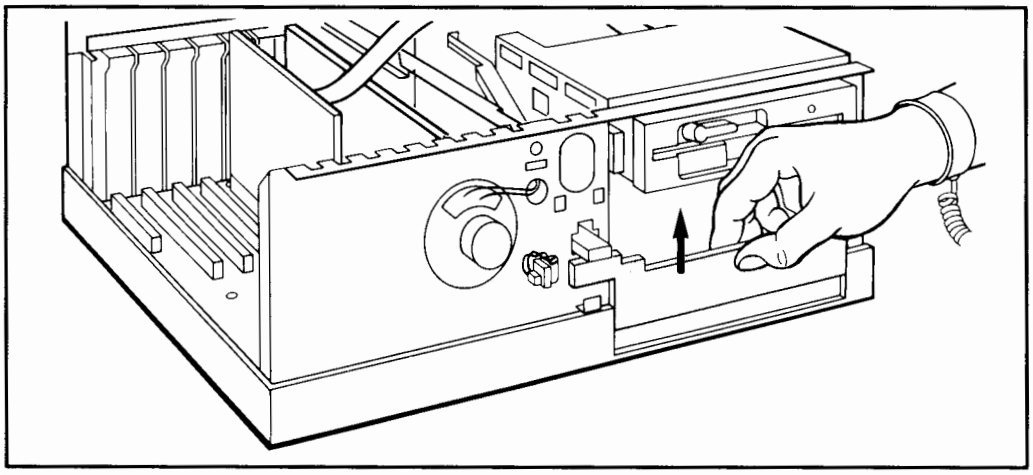
A = top shelf, B = middle shelf, and C = bottom shelf

Installing the First Hard Disk Drive

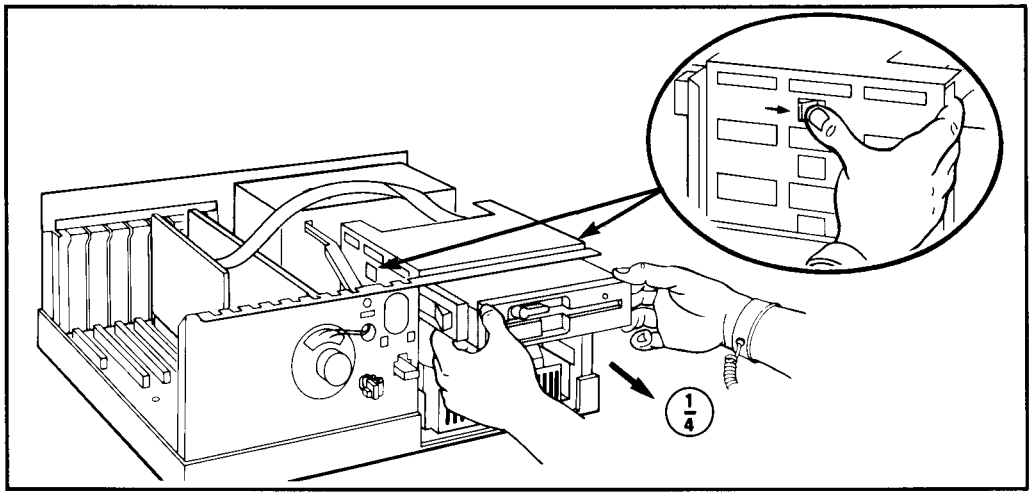
Caution

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.

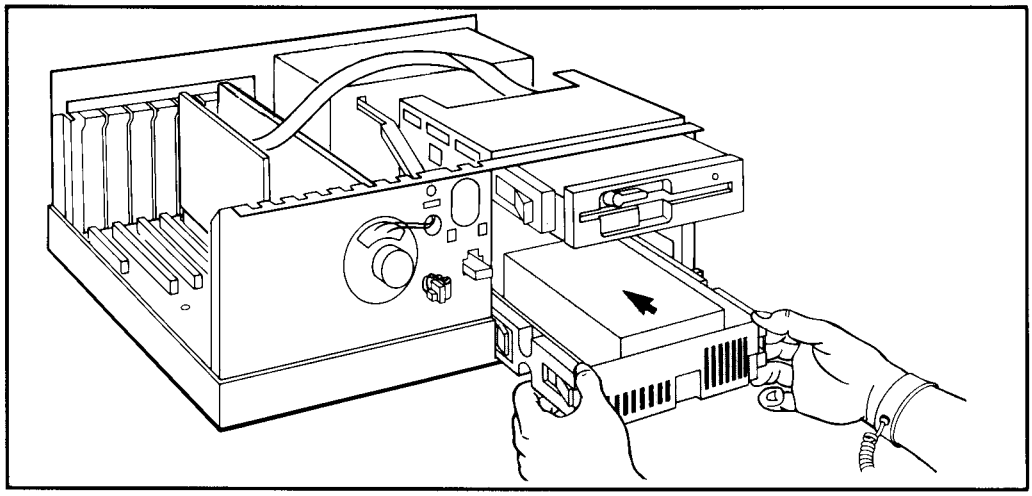
1. **Ensure your hard disk drive uses the same type of disk controller that is installed in your computer.** Refer to appendix A to identify the controller and drive. (Drive types cannot be mixed. You can have two ST-506 or two embedded-AT disk drives but not one of each.)
2. **Switch OFF the computer and disconnect the data and power cables.**
3. **Remove the cover.** (Refer to chapter 2.)
4. **Configure the hard disk drive.** Refer to the drive's manual to see if it has any jumpers or terminating resistors to be set or has a special installation procedure.
5. **Remove the panel that covers the computer's bottom hard disk drive shelf.**



6. **Slide the flexible disk $^1/_4$ of the way out of the top shelf.** Press in the latches on each side of the flexible disk drive. Then pull out the drive.



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

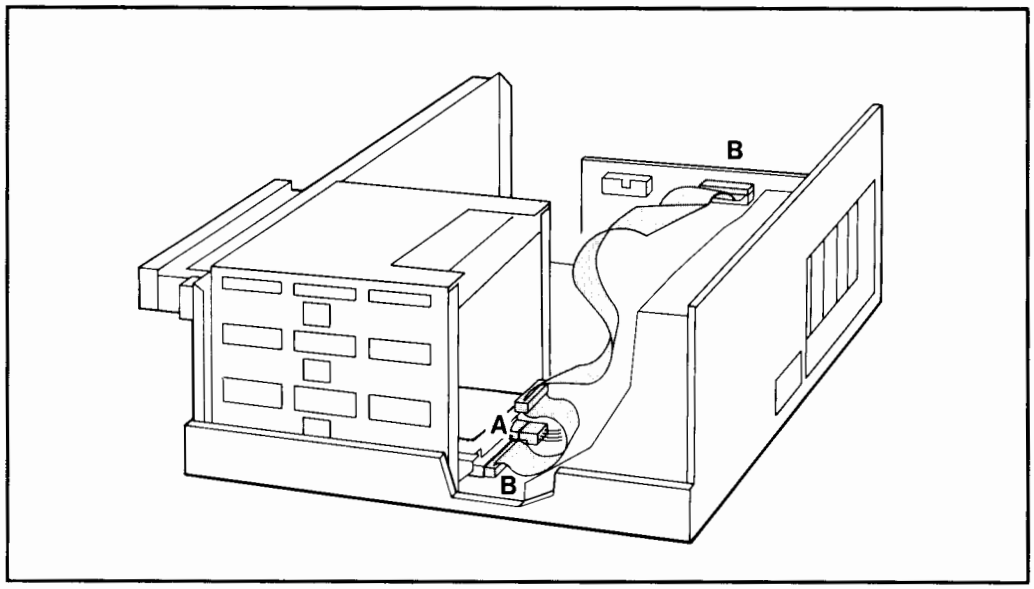


8. **If you are installing an embedded-AT controller hard disk drive (42 MB and above)—the controller board (slot 5) has two sockets:**

   a. Plug the power cable (A) into the drive.

   b. Plug the last connector on the control cable (B) into the drive.

      Plug the other end of the control cable into the controller board (slot 5).



9. **If you are installing an ST-506 hard disk drive (20 MB)—the controller board (slot 5) has four sockets:**

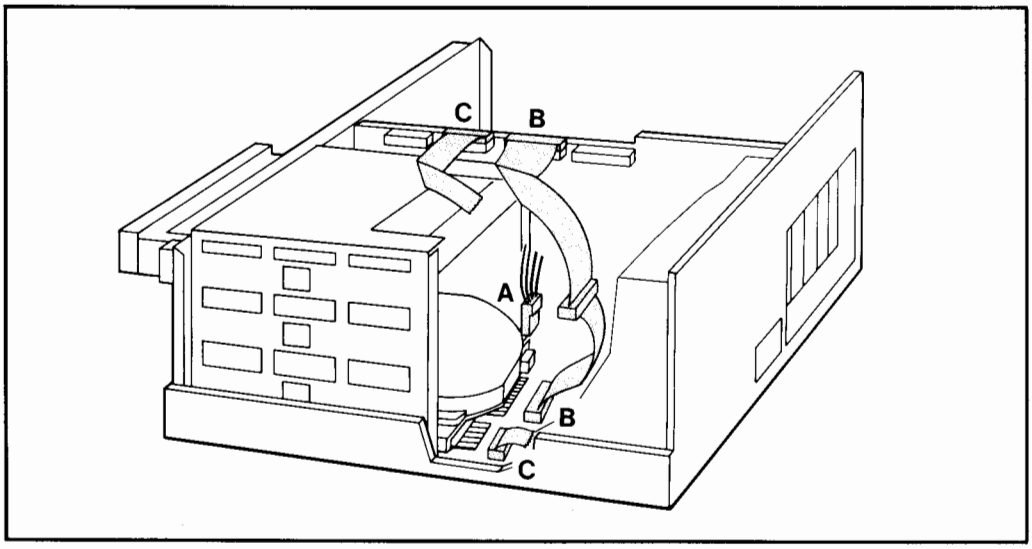
   a. Plug the power cable (A) into the drive.

   b. Plug the last connector on the control cable (**B**) into the drive.

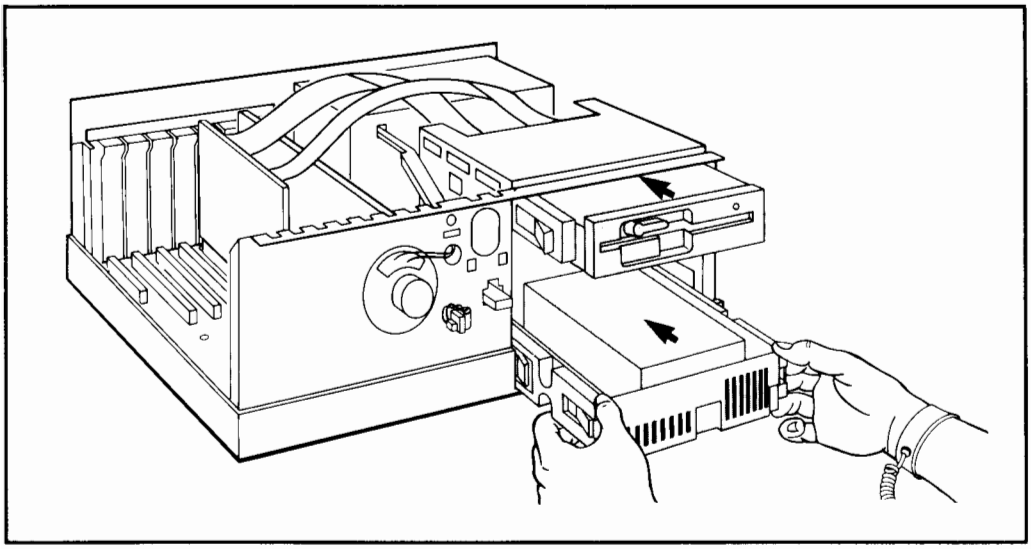
      Plug the other end of the control cable into the controller board (slot 5).

   c. Plug the data cable (C) into the drive.

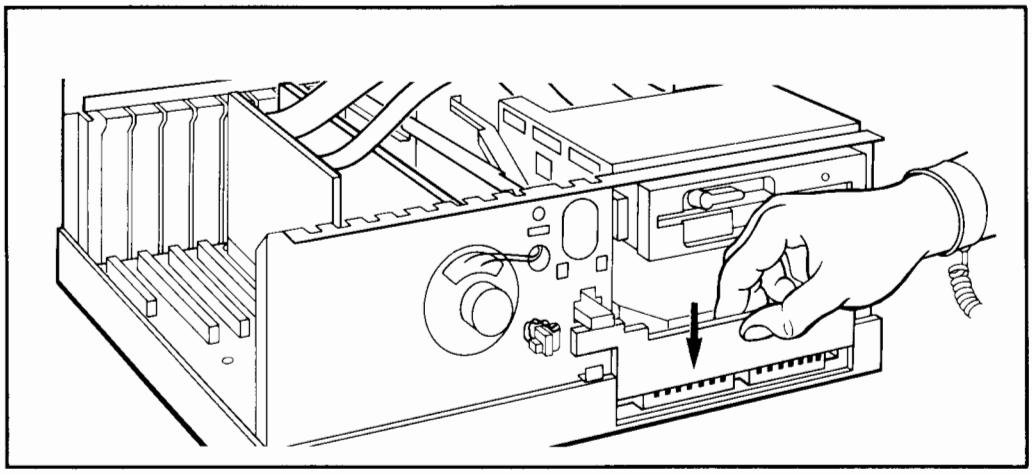
      Plug the other end of the data cable into the controller board (slot 5).



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



11. **Reinstall the panel that covers the hard disk drive shelf.**



12. **Turn to the "Additional Items Installed" section in chapter 1.** Record the disk drive type and size on one of the lines provided.
13. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)
14. **Replace the cover.** (Refer to chapter 2.)
15. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

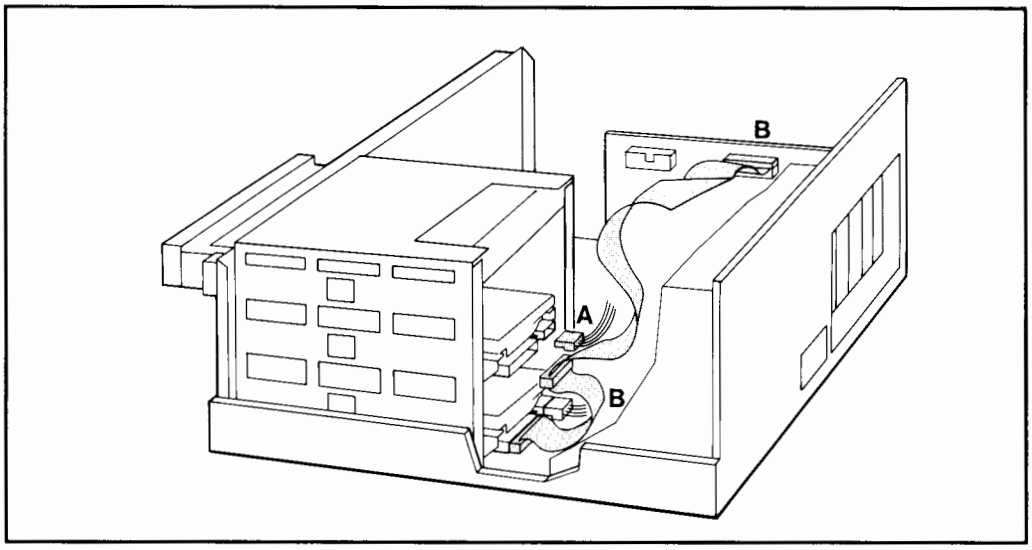
    Remember to run the SETUP program to declare the new disk. (Refer to chapter 8.)

Installing a Second Hard Disk Drive

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

1. **If necessary, configure the first hard disk drive.** Refer to the manual that came with the disk drive.
2. **Install the second drive in the middle shelf.**
3. **If you are installing an embedded-AT controller hard disk drive (42 MB and above)—the controller board (slot 5) has two sockets:**
   a. Plug the power cable (A) into the drive.
   b. Plug the middle connector on the control cable (B) into the drive.

   (The other end of the control cable is plugged into the controller board, slot 5).



4. **If you are installing an ST-506 hard disk drive (20 MB)—the controller board (slot 5) has four sockets:**

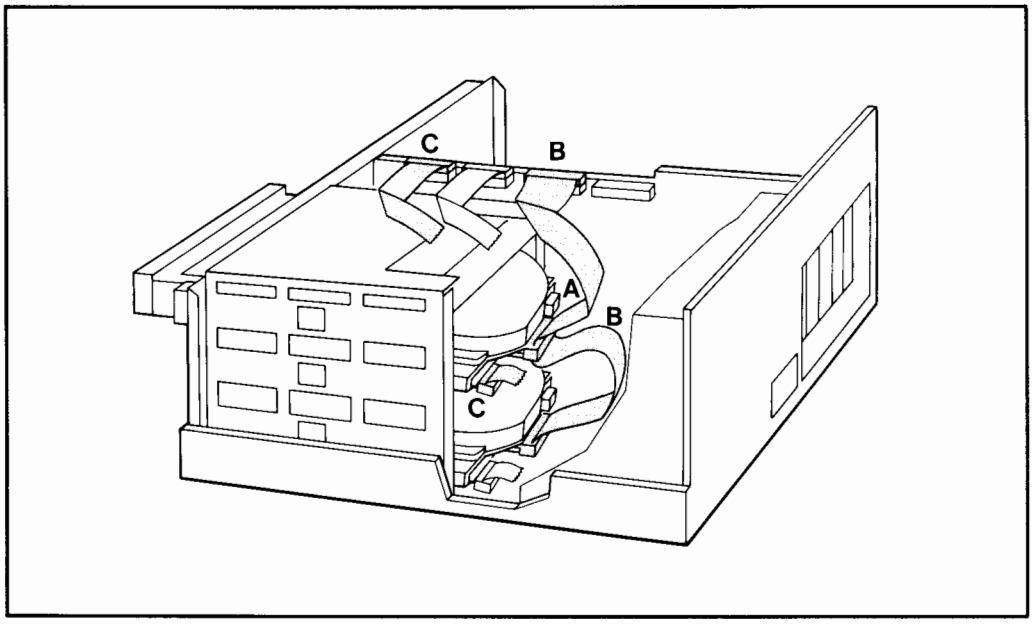
   a. Plug the power cable (A) into the drive.

   b. Plug the middle connector on the control cable (B) into the drive.

      (The other end of the control cable is plugged into the controller board, slot 5).

   c. Plug the data cable (C) into the drive.

      Plug the other end of the data cable into the controller board (slot 5).



5. **Turn to the "Additional Items Installed" section in chapter 1.** Record the disk drive type and size on one of the lines provided.
6. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)
7. **Replace the cover.** (Refer to chapter 2.)
8. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

   Remember to run the SETUP program to declare the new disk. (Refer to chapter 8.)

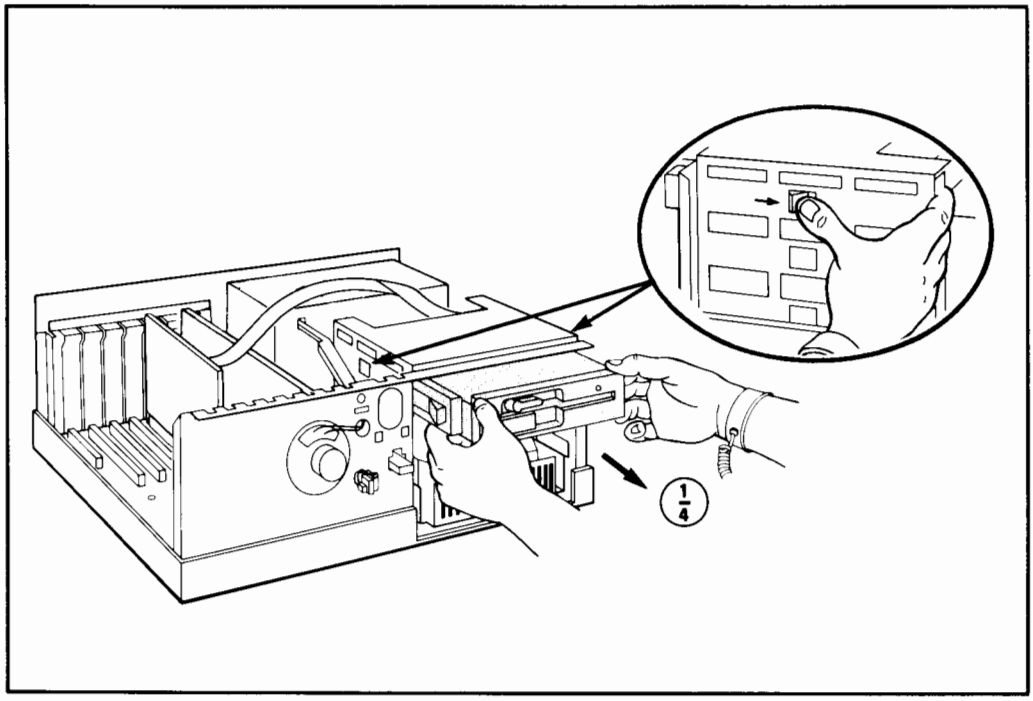
Installing a Second Flexible Disk or Tape Drive

Caution

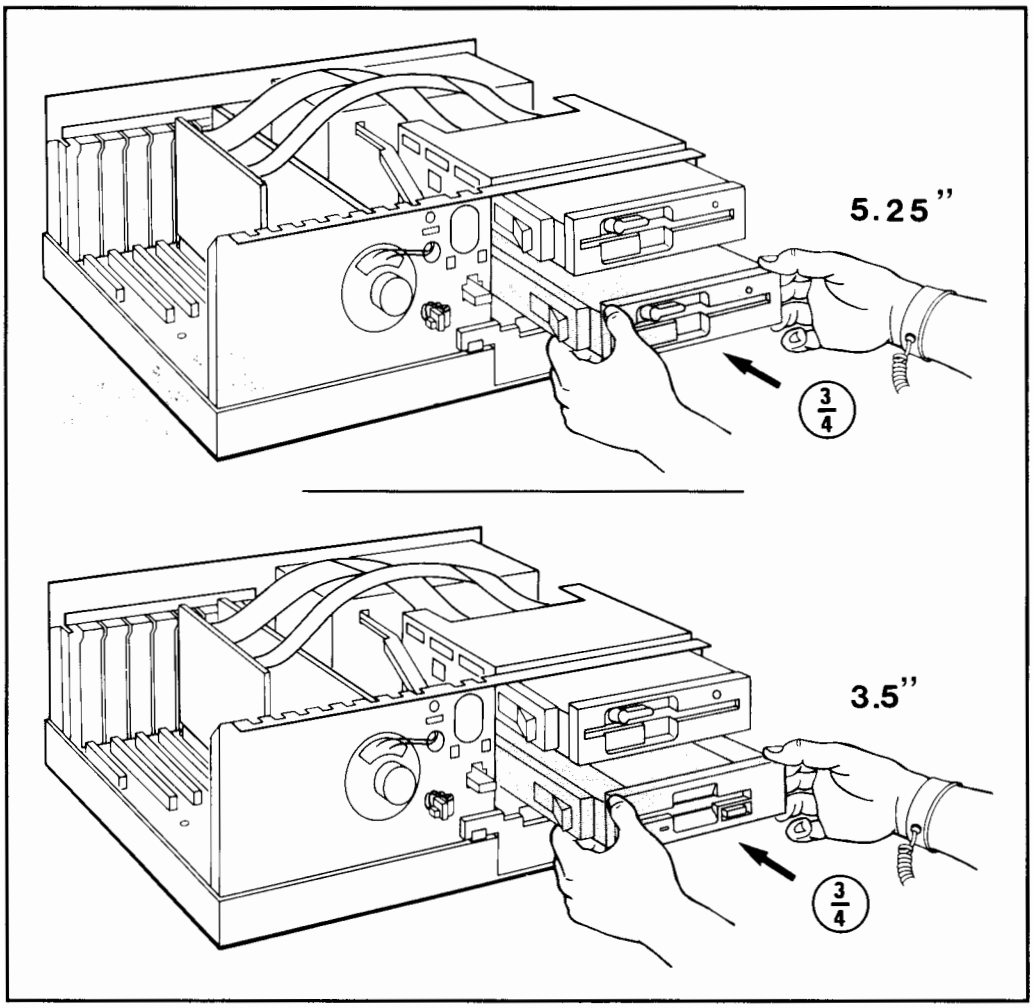
Leave the drive in its anti-static bag until you are ready to install it. Handle the drive by the edges only. Do not drop it.

Flexible disk and tape drives are installed in the same way (both use the same type of power and data cables).

1. **Switch OFF the computer and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)
3. **Slide the first flexible disk $^1/_4$ of the way out of the top shelf.** Press in the latches on each side of the flexible disk drive. Then pull out the drive.



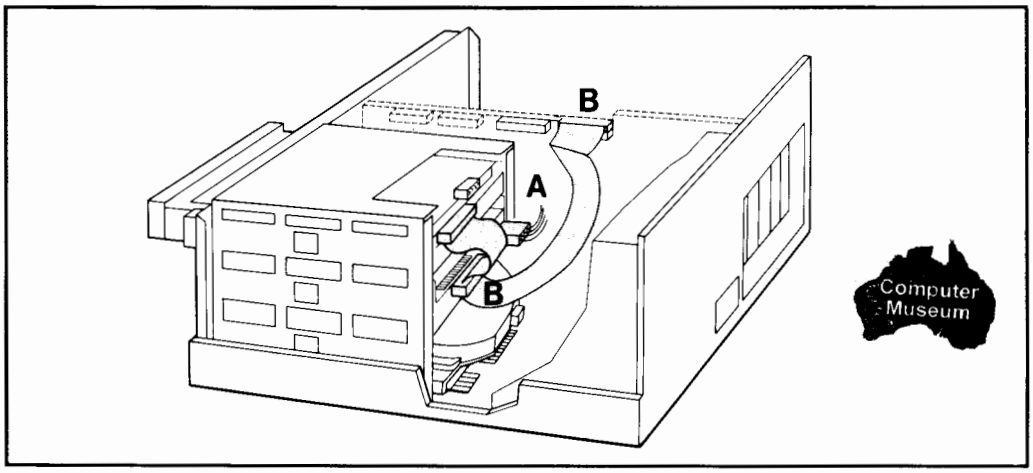
4. Slide either the 5.25-inch or 3.5-inch second flexible disk drive $^{3}/_{4}$ of the way into the middle shelf.



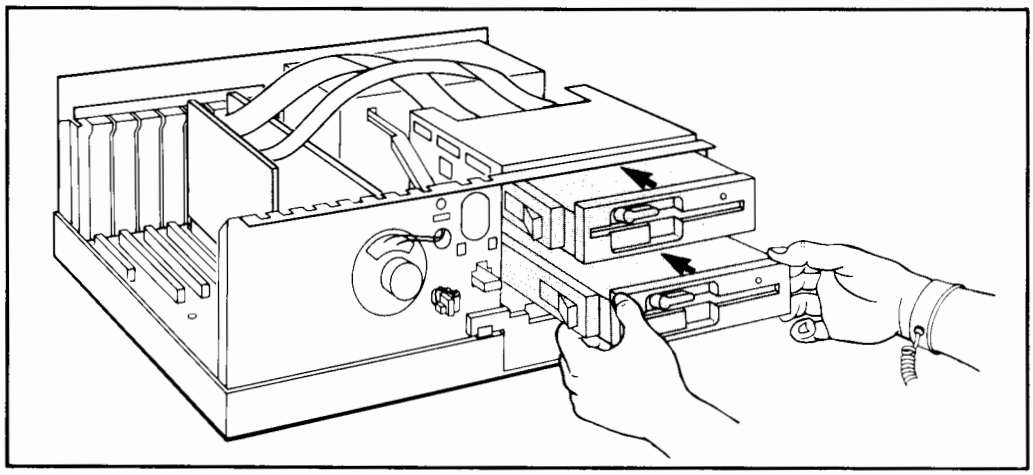
5. **Connect the drive cables.**

   a. Plug the power cable (A) into the drive.

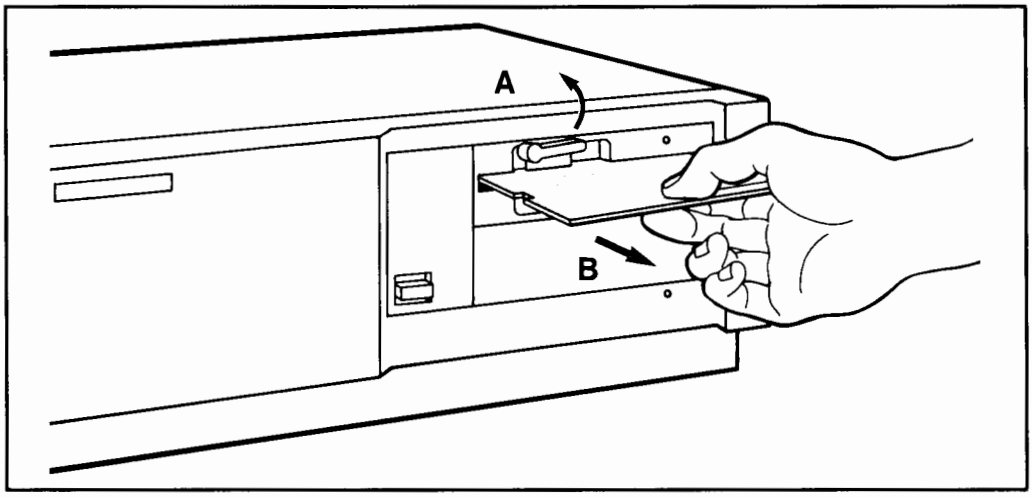
   b. Plug the middle connector on the control cable (B) into the drive. (The other end of the control cable is plugged into the controller board, slot 5).



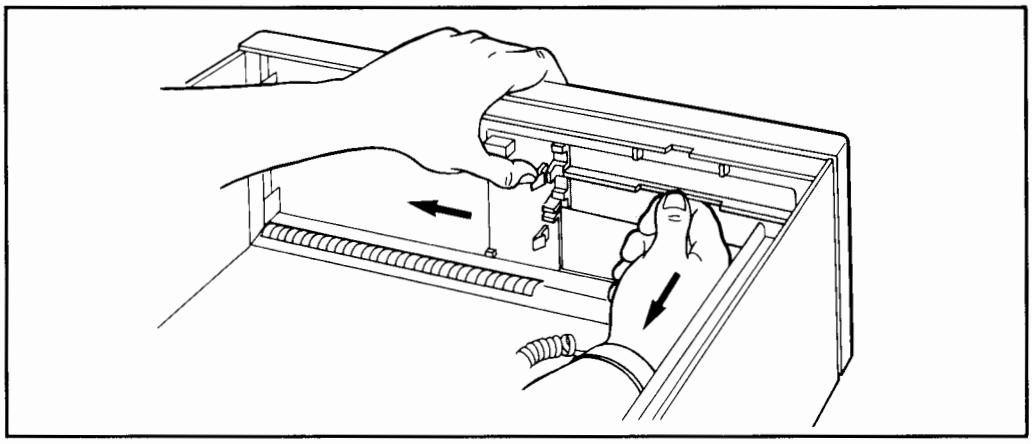
6. **Slide the drives firmly into place.**



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



8. **Remove the panel that covers the disk slot in the computer's cover.** Turn the cover upside down. Unclip the locking tab, and lift the panel out.

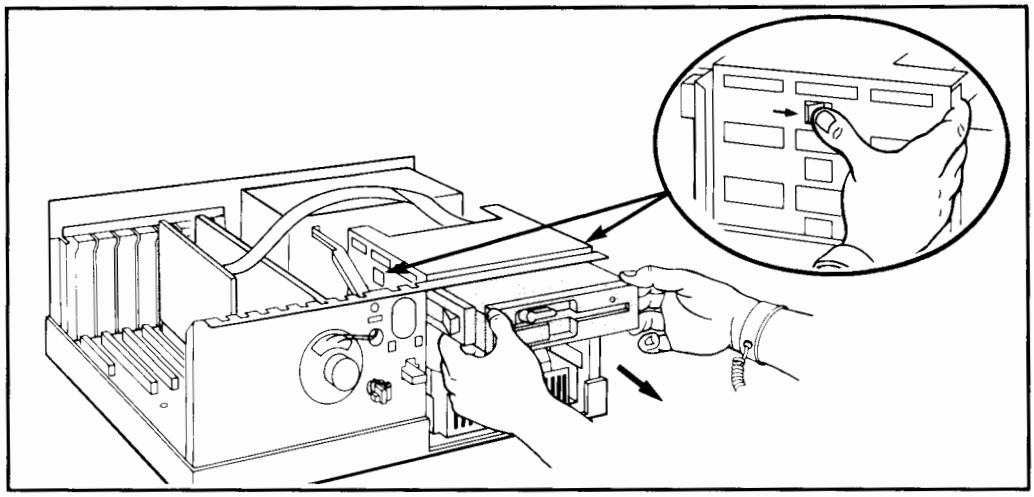


9. **Turn to the "Additional Items Installed" section in chapter 1.** Record the disk drive type and size on one of the lines provided.
10. **If you have other accessories to install, install them now before replacing the cover.** (Refer to the setup checklist in chapter 1.)
11. **Replace the cover.** (Refer to chapter 2.)
12. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1.**

    Remember to run the SETUP program to declare the new disk. (Refer to chapter 8.)

Removing Drives

1. **Switch OFF the computer and disconnect the data and power cables.**
2. **Remove the cover.** (Refer to chapter 2.)
3. **Disconnect the cables from the rear of the drive.**
4. **Slide the drive out of the shelf.** Press in the latches on each side of the drive. Then pull out the drive.



8

Configuring Your Vectra 286/12 Using the SETUP Program

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 board).

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. **Insert the SETUP AND UTILITIES DISK into drive A.**
3. **Turn on the display and computer.**
   a. 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.
   b. The message
   "`Invalid configuration information - Run configuration utility (SETUP) Strike F1 to continue`"
   will appear if an error is detected during the power-on selftest.
   c. The SETUP program will start.

      If you are prompted to select the language type of your keyboard, do so.
   d. The SETUP MAIN MENU will appear.

4. **Run option 1 (Set System Configuration) of the SETUP program.**

   If the power-on selftest detected an error, you will be reminded to run option 1 to correct the errors.

   Follow the instructions on the screen to enter the time and date, the type of flexible disks, the type of hard disks, and memory configuration.

5. **Run the other options.** Select the appropriate option if you need to set power-on password, keyboard option defaults, and speed defaults. (Refer to the section "SETUP Program Options" for more information on options.)

   Run option 4 (Initialize Internal Hard Disk) if this is the first time you are starting your computer AND you have a 20 MB hard disk drive.

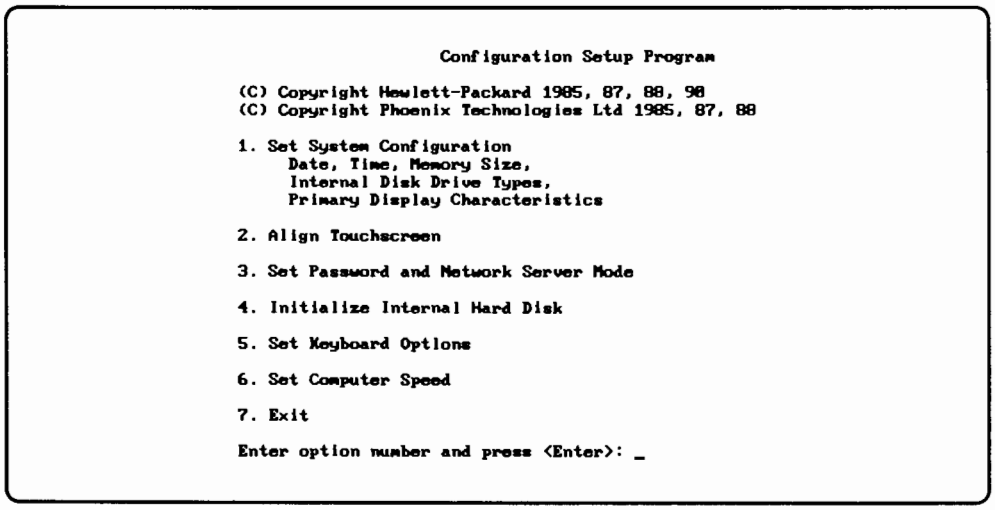
6. **Select option 7 (Exit) to restart the machine** (the values you entered during the options will be recorded).

7. **If you are setting up the computer for the first time, return to the setup checklist in chapter 1 to continue with installing your software.**

Running the SETUP Program

Complete these steps if you are using SETUP to on a computer that is already operating.

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.
4. 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.
5. The SETUP main menu will then appear.



6. Select the desired action to be performed by entering the number of the menu option or the command line switch option.

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

   All options are documented on the screen. Refer to the sections "SETUP Program Options" or "SETUP Program Command Line Options."

SETUP Program Options

The SETUP program options are described below.

1. Set System Configuration

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

You *must* run the `Set System Configuration` option if any of the conditions mentioned in the screen below are met:

```
This program stores system configuration
information in your computer's battery-backed-up memory.
This program must be run when:

o setting up your computer for the first time

o setting the time and date

o adding or removing memory, internal disk drives
  or display monitors

o changing the batteries

Press any key to continue._
```

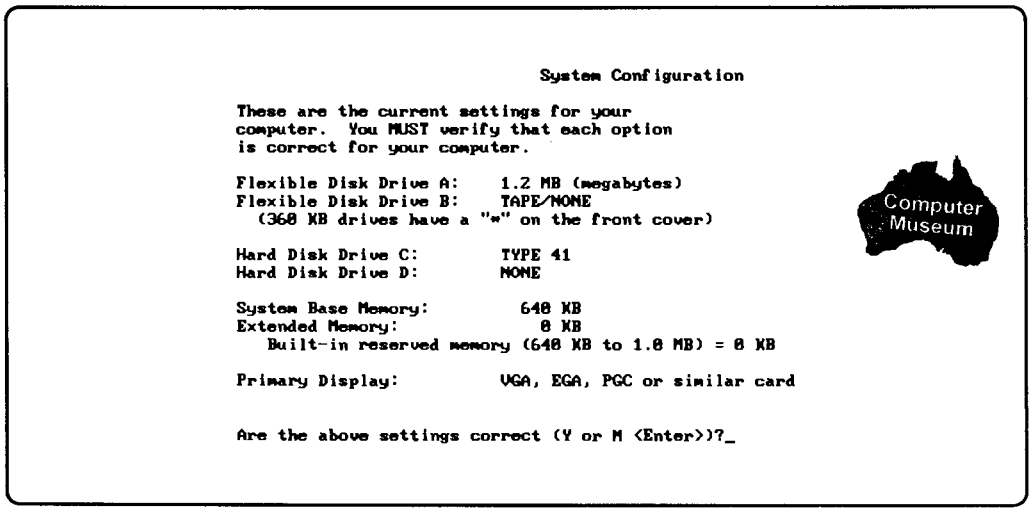
An error message will be displayed on the screen if the current settings did not match what was found in your computer.

If no errors were detected, the current setting will be displayed immediately.

SETUP will request that you check the current time and date.

Press (Y) (Enter) if the time and date are correct;
otherwise press (N) (Enter) and then the correct time and date.

SETUP will present a screen displaying the current settings for disk types, memory and video.



If any of the settings are incorrect, press (N) (Enter) to display and change the settings one at a time.

Flexible Disk or Tape Drives

Enter the number corresponding to the flexible disks you have.

Hard Disk Drives

The `Hard Disk Drive` screens include **Hard Disk C: and D:** fields for the type of hard disk - a number between 1 and 47. If the values displayed are not correct, enter the number and type for your hard disks.

```
                                    Hard Disk Drive

Your hard disk drive types are:

Hard Disk Drive C:          TYPE 2
Hard Disk Drive D:          NONE


Are the above settings correct (Y or N <Enter>)?_
```

The correct hard disk drive type is printed on the hard disk drive. You can also find hard disk drive type information for factory-installed hard disk drives in chapter 1.

For example, if you have the hard disk and controller listed below, enter the drive type number shown:

Disk Size	Controller	Use this hard disk type number
20 MB	ST-506	2
42 MB	AT Multifunction	37
84 MB	AT Multifunction	38

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.

The table below shows the characteristics for other hard disk drives. Contact your HP dealer for information on which hard disk drives can be installed in your HP Vectra 286/12 PC.

Hard Disk Characteristics

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
1	966	9	none	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	814	9	none	813	120 MB
11	855	5	none	855	36 MB
12	855	7	none	855	52 MB
13	968	10	none	967	168 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	1775	7	none	1780	330 MB
21	1630	8	none	1630	360 MB
22	733	5	300	733	30 MB
23	1222	15	none	1222	319 MB
24	1024	5	none	1024	44 MB
25	1024	8	none	1024	71 MB

Hard Disk Characteristics (continued)

Hard Disk Drive Type	Cylinders	Heads	Start Precomp.	Landing Zone	Approx. Capacity
26	1024	9	none	1024	80 MB
27	646	16	none	646	333 MB
28	1023	16	none	1023	528 MB
29	271	16	none	271	139 MB
30	1294	16	none	1294	667 MB
31	732	7	300	732	42 MB
32	1240	7	none	1240	151 MB
35	611	16	none	611	315 MB
36	1631	15	none	1631	651 MB
37	965	5	none	964	42 MB
38	965	10	none	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	none	1023	267 MB
43	805	4	none	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

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.**

Your computer is shipped with 640 KB of system base memory and 384 KB of reserved memory.

Base memory is automatically reduced from 640 KB to 512 KB or 256 KB if you have installed an accessory board that has a memory address that conflicts with the installed base memory (backfill memory on an accessory board for example).

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.

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.

Some applications (Lotus 1-2-3 Release 3 for example) need extended memory in addition to base memory.

If you have only the standard 1 MB of memory (640 KB Base and 384 KB reserved) and you want to run such an application, use the SETUP program option GBS to turn Global BIOS Shadowing off; this converts the 384 KB reserved memory to extended memory. The SETUP program automatically declares changes to the reserved and extended memory sizes for you.

Video Configuration

Your HP Vectra 286/12 comes with a built-in VGA controller. The default setting for the video adapter is `VGA, EGA, PGC or similar`. If you have installed a different video controller, select the correct type from the list provided.

2. Align Touchscreen

This is used with the optional touchscreen and HIL interface board (which allows you to select choices by touching the display screen).

3. Set Password and/or Network Server Mode

You can use this SETUP option to supply your own password, and to change your password later. (Refer to chapter 10 for more information on computer security.) The Password Mode requires the **password enable** switch to be set to OFF (enabled). The switch is set to the default value of OFF (enabled) by the factory. (Refer to appendix A for switch information.)

There are two modes for password operation: power-on password and network server mode.

Power-on password. The power-on password adds an additional level of security to that of the security lock on its own.

The security lock can disable the keyboard from functioning.

The power-on password requires that a password be typed in after the keyboard is enabled.

When the power-on password is set, a password prompt appears as soon as the computer is powered on. (The password is not set when you first receive your computer.)

Network server mode. The network server mode is intended for computers which operate unattended and provide files over a network link to other computers or terminals. The computer will start working as soon as the power is turned on without waiting for the power-on password.

Changing the Power-On Password

The SETUP program displays the current settings for power-on password and network server mode. If you want to change the displayed values, press N Enter and then enter or erase the password.

Note

Type carefully when you enter the new power-on password. The characters you enter will not appear on the screen. You will be asked to retype the password a second time to ensure that you have not made a typing mistake.

Note that the keys on the numeric keypad are not the same as the keys on the top row of keys.

To change your current power-on password from the power-on prompt, enter:

oldpassword/newpassword Enter

In this example, `OLDPASSWORD` is your current password and `NEWPASSWORD` is the new password you want to use. If you do not enter a new password, that is if you press the Enter key immediately after `OLDPASSWORD/`, the existing password will be cancelled.

Restart your computer to put the new password into effect. (Press Ctl + Alt + Del simultaneously.)

Selecting Network Server Mode

The power-on password must be set before you can enter network server mode.

After you have entered the power-on password, you will be presented with the following prompt:

```
Network Server Mode: Disabled
Do you want to enable network server mode (Y or N <Enter>)?
```

Type Y Enter if you want network server mode to be active.

When network server mode is in use, the password prompt will not be displayed at power-on.

You can use this menu entry later to disable the network server mode.

If You Forget Your Power-On Password

If you forget your power-on password, or wish to temporarily switch off the password feature for some other reason, you must disable the power-on password feature by setting switch 4 on the system board to ON (refer to chapter 10).

4. Initialize Internal Hard Disk

Initialization prepares a hard disk drive to receive data.

Hewlett-Packard high capacity hard disk drives greater than 20 MB *do not* need to be initialized using this option; they are fully initialized at the factory.

Only the 20 MB (ST-506) hard disk drive must be initialized the first time you turn on your computer. You must also initialize any new 20 MB 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 format it and install your operating system on it.

5. Set Keyboard Options

Keyboard Click

The Keyboard Click Volume option controls the loudness of the keyboard click (the sound that occurs when you press a key).

When the keyboard click volume is 15, you can hear the keys as you type. When it is 0, the keys are silent.

Values between 0 and 15 vary the volume from soft to loud.

Typing Speed

The Typing Speed option controls the "repeat rate" when a key is held down. The speed can be set to slow, medium or fast.

Power-on NumLock Function

The Numlock Function controls the state of the numeric keypad when your computer is first turned on (NumLock ON = numeric mode; Numlock OFF = cursor control mode). When the computer is working, use the NumLock key to change the Numlock state.

6. Set Computer Speed

The Set Computer Speed Speed option allows you to change the speed at which your computer operates. (The current speed is displayed when you select this option.)

Your Vectra 286/12 can operate at:

12 MHz (HIGH) always,
8 MHz (LOW) always, or
12 MHz except for I/O access when it switches to 8 MHz (AUTO).

The factory setting is HIGH. 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 HIGH speed.

The SETUP program will display the current state (HIGH for example) and ask if you wish to switch to AUTO.

Enter (Y) to select the new speed or (N) to retain the current speed. You cannot select the LOW speed from the SETUP program.

The computer will change to the new speed after it is restarted.

To use software that needs to run at a slower speed, you can also use the EXMODE command. Refer to chapter 9, "Installing and Using the HP Utilities," for information about the EXMODE command. The EXMODE command will allow you to change the speed to LOW, HIGH or AUTO without the need to restart the computer.

SETUP Program Command Line Options

The SETUP program has 18 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, or `SETUP /H` at the MS-DOS command line, for a list of the command line options.

Command Line Option Descriptions

The following is a description of some 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. (Refer to 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.

/GBS **To enable/disable global BIOS shadowing.** This option allows you to enable or disable shadowing for *all* BIOS. If you disable global BIOS shadowing, no part of BIOS will be shadowed, regardless of whether you use the /ORS or /VBS switches. If you enable global BIOS shadowing, the system BIOS will be shadowed and the /ORS and /VBS switches will control option ROM and video ROM shadowing.

When global BIOS shadowing is disabled, the 384 KB of reserved memory is remapped as extended memory. This allows programs that require extended memory (Lotus 1-2-3 ^{R} for example) to run.

/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.** 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 moved. You should also use this option before removing a 20 MB hard disk drive from your computer or when you are moving the computer. Once run, turn off the computer immediately.

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

/ORS **To enable/disable option ROM shadowing.** Used to enhance performance.

/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.

/VBS **To enable/disable video BIOS shadowing.**

/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, type:

SETUP *options* Enter

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 Enter

If you wish to activate one of the command line switches from the SETUP program main menu prompt, at the prompt to enter the option number, type:

/ *switch* Enter

where *switch* is one of the command line switches. Separate command line options with a blank space. For example:

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

Use the option /H to display a list of all possible options.

9

Installing and Using the HP Utilities

Introduction

This chapter explains how to install and use the HP Utilities:

- EXMODE (on the SETUP AND UTILITIES diskette).
- HP Extended Memory Manager Program (on the SETUP AND UTILITIES diskette).
- HP Super VGA (Video Graphics Adapter) Utilities and Drivers (on the HP SUPER VGA UTILITIES AND DRIVERS diskette).

These utilities are for MS-DOS users only.

The instructions in this chapter assume that you have your MS-DOS system files on your hard disk.

Installing the Utilities from the SETUP AND UTILITIES Diskette

The computer comes with a flexible SETUP AND UTILITIES diskette containing HP Utilities. To install the HP Utilities, you need to do the following:

1. **Make a backup copy onto a flexible diskette of your CONFIG.SYS file and AUTOEXEC.BAT file.** (Refer to your MS-DOS documentation for help about making backup copies.) This protects your files during installation.
2. **Make a directory for the HP Vectra utilities.** At the MS-DOS prompt, enter:

   `MD C:\HPUTIL` Enter

   Where `HPUTIL` is the name of the directory where you want to install the utilities.

3. **Insert the SETUP AND UTILITIES diskette in drive A.**
4. **Install the utilities.** At the MS-DOS prompt, enter:

   `INSTL286 C:\HPUTIL` Enter
5. **If new utilities have been added to the disk, there will be new instructions in a README file.** Read the README file by entering:

   `A:README` Enter

Installing the Mouse Driver

If you have purchased a mouse, the HP mouse driver software is on the diskette supplied with it.

To install the mouse driver, insert the mouse diskette in drive A and enter:

`MSETUP` Enter

and follow the instructions on the screen.

The mouse switch on the system board must be set to OFF. The normal switch position from the factory is OFF (enabled).

MS-Windows If you are going to use MS-Windows/286 ^{R}, then you need to use the MS-Windows mouse driver. Install this driver as follows.

1. **Insert the MS-Window's setup diskette in drive A and start the installation as described in the Window's manual.**
2. **When prompted to chose a computer, enter HP Vectra.**
3. **The screen will display default settings for the HP Vectra.**
4. **Do not accept the defaults.** Move the highlight to the line containing "mouse" and press Enter.
5. **Choose `Microsoft mouse connected to PS/2 mouse port`.**

If you use MS-Windows, you should also install the HP Super VGA drivers for Windows. (Refer to the sections "Installing the Utilities from the HP Super VGA Diskette" and "Using the HP Super VGA Utilies and Drivers" in this chapter.

Installing the Utilities from the HP Super VGA Diskette

Note

You need a hard disk (preferably with a minimum of 2 MB of free disk space) to use the batch file described below.

The HP Super VGA comes with a flexible diskette containing utility programs and high resolution drivers for software packages. To install the VGA utilities and drivers, you need to do the following:

1. **Make a directory for your HP Super VGA utilities and drivers.** At the MS-DOS prompt, enter:

   `MD C:\HPVGA` Enter

   where HPVGA is the name of the directory where you want to install the utilities and drivers.

2. **Insert the HP Super VGA Utilities and Drivers diskette in drive A.**

3. **If you want to unpack ALL the video drivers, enter:**

   `UNPACK C:\HPVGA 0` Enter

   where HPVGA is the directory you created in step 1.

   This command executes the UNPACK.BAT file, which automatically creates subdirectories for the utilities and drivers in the HPVGA directory and copies all software application drivers to the correct subdirectory.

4. **If you want to unpack only ONE of the application drivers, enter:**

   `UNPACK C:\HPVGA` Enter

   where HPVGA is the directory you created in step 1.

   This command executes the UNPACK.BAT file and displays a menu of available drivers. Follow the instructions on the screen.

5. **If new drivers have been added to the disk, there will be new instructions in a README file.** Read the README file by changing to the HPVGA directory and entering:

   `README` Enter

Using EXMODE

EXMODE is an HP Utility that allows you to temporarily change the processing speed of your computer and the keyclick volume.

You installed EXMODE when you copied the SETUP AND UTILITIES DISK to the HPUTIL directory as described in "Installing the Utilities from the SETUP AND UTILITIES DISK."

If you placed the utilities in a different directory or drive, modify the instructions below to match your drive and directory.

Note that if you use the MS-DOS *PATH* command to include `C:\HPUTIL` in the search path, you will not need to enter `C:\HPUTIL` before **EXMODE** whenever you use it. (Refer to your MS-DOS documentation for information on the PATH command.)

Changing the Processor Speed

The syntax for using EXMODE to change the processor speed is:

`C:\HPUTIL\EXMODE SPEED` *speed* Enter

where:

speed	is the computer speed—possible values are: HIGH (for 12 MHz), LOW (for 8 MHz), or AUTO (12 MHz with automatic switch to 8 MHz for disk access). If you do not specify a speed, the current setting is displayed.

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

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

  `C:\HPUTIL\EXMODE SPEED LOW` Enter

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

```
C:\HPUTIL\EXMODE SPEED LOW
APPLIC.EXE     - replace this line with your program name
C:\HPUTIL\EXMODE SPEED HIGH
```

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

Changing the Volume of the Keyboard Click

The syntax for using EXMODE to change the keyboard click is:

C:\HPUTIL\EXMODE CLICK *volume* Enter

where:

volume	is a number between 0 and 15 for the click volume. 0 is inaudible and 15 is maximum volume.

EXMODE Help

If you forget the options to use with EXMODE, type:

C:\HPUTIL\EXMODE Enter

and the commands and options for changing the speed and click volume will be displayed.

Using the HP Expanded Memory Manager Program HPEMM

Note

Install HPEMM *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.)

HP Expanded Memory Manager (HPEMM) 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. (Refer to chapter 10 for a description of the memory.)

You installed HPEMM when you copied the SETUP AND UTILITIES DISK to the HPUTIL directory as described in "Installing the Utilities from the SETUP AND UTILITIES DISK."

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

Preliminary Steps to Load HPEMM

Decide if you need to load HPEMM.

1. **Load** HPEMM 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^{R} Windows/286, release 2 of Lotus^{R} 1-2-3^{R}, dbase III^{R}, and dBase IV^{R}.
2. **Do not load** HPEMM if you:
   - Use an operating system other than MS-DOS.
   - If your application uses extended memory (such as Lotus 123 ^{R} Release 3). Refer to your application manual for the type of memory used. Use the SETUP program to remap reserved memory to extended memory.

3. To load HPEMM, add this line to your **CONFIG.SYS** file using an ASCII word processor.

   ```
   DEVICE=C:\HPUTIL\HPEMM.SYS
   ```

   Note that you can create a customized command line by adding parameters to the HPEMM.SYS command. See "Customizing the HPEMM 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:

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

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

4. Restart your computer by turning it off and then back on.

Customizing the HPEMM Command Line

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

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

```
DEVICE=C:\HPUTIL\HPEMM.SYS [FRAME=nnnn] [INCLUDE=xxxx- yyyy]
[EXCLUDE=zzzz-aaaa] [EXT=nnnn] [NOXRAM] [TEST] [HANDLES=nn]
[CONTEXTS=nnn] [DEPTH=nn] [AUTOSIZE]
```

The numeric parameters for the memory size should be in hexadecimal notation. Only the first character of the parameter is significant (except for EXCLUDE, where X is used as the abbreviation).

Explanation of HPEMM Command Line Parameters.

Parameter	What it Does
drive:	Refers to the drive where HPEMM 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 is installed. Default: If no path is specified, the current directory is assumed.
FRAME (or F) = *nnnn*	Specifies the beginning address (in hexadecimal) of the 64 KB page frame. The beginning address must be a multiple of 16 KB (or 400 hex, segment addresses are extended by 4 bits to create the actual address) and must fall between 800 and 832 KB (C800 and D000 hex before internal extension to C8000 and D0000). (This address is called the "page frame address".) See the table below for possible page frame addresses you can enter. C000 to C800 hex is used by the video circuit. **Do not** specify a page frame address, but let HPEMM choose the most appropriate value. If you find, however, that HPEMM interferes with the operation of another I/O device (such as a network board, video board, or disk drive controller), 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 board; for example, C800. Then enter `FRAME=C800` in your HPEMM command line. Default: If no FRAME parameter is specified, HPEMM chooses the most appropriate page frame address for you, depending on the accessory boards installed in your system.

Various Page Frame Addresses You Can Use

Type:	Then Type a Page Frame Address (in Hex):
FRAME=	C800
	CC00
	D000

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 (or I) =*xxxx-yyyy*
EXCLUDE (or X) =*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 maps pages of expanded memory.

INCLUDE or EXCLUDE selects memory in multiples of 16 KB (400 hex). The lower address should be the 16 KB boundary on or below the desired lower exclusion range, while the upper address specified should be one less that the 16 KB boundary on or above the desired upper limit.

If you want more than 64 KB, and if you hardware does not need the memory, you can use the INCLUDE command in addition to the FRAME command. The HPEMM driver automaticaly excludes memory areas which contain ROM and video RAM.

For example, you have hardware that uses the (segment) memory addresses between C800 and CFFF hex, but you do not know if the HPEMM software can recognize your hardware: you must EXCLUDE the questionable memory.

```
EXCLUDE=C800-CFFF
```

Default: If INCLUDE and EXCLUDE parameters are not specified, HPEMM allows the application software to map expanded memory to addresses from 256 KB to 640 KB and to the 64 KB area starting at the FRAME address (refer to the discussion on FRAME above and the "LIM4 Specification").

Note that the value specified, for example C800, is extended to the full width, C8000 for this example, by the memory controller when the actual memory addressing occurs. The decimal equivalents for numbers refer to the already extended hex number.

HPEMM will also automatically exclude areas known to contain Option or BIOS ROMs or video RAM.

Note

If you have an HP 82328A Intelligent Graphics Controller Adapter board or an HP ScanJet board installed, you must specify the board's address range using the EXCLUDE option. The address range for this board is typically CC00-CFFF. If you have configured the board to use a different address range, the value will be different (try to leave 64 K free between C000 and DFFF). Refer to the documentation that comes with your graphics board for more information.

EXT=*nnnn*

Specifies, in kilobytes, the amount of extended memory to leave when HPEMM is installed. The rest of available memory is converted to expanded memory. Use EXT when you want install other programs (for example VDISK) in extended memory after you install HPEMM.

Default: If no value is specified for EXT, HPEMM converts all available memory into expanded memory. HPEMM does not support XMS, but can coexist with it. If you want XMS, you must use the HIMEM driver supplied with your operating system or Windows 2.x (place the line `HIMEM.SYS` in CONFIG.SYS before the `HPEMM.SYS` line).

NOXRAM

This option will prevent HPEMM from using reserved memory. (Shadow RAM is automatically detected and will not be used.)

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

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

HANDLES=*nnn*	Specifies the number of handles that will be available for programs which use EMS memory.
CONTEXTS=*nnn*	Specifies the number of contexts which can be saved by processes using EMS memory.
DEPTH=*nn*	Specifies the number of consecutive contexts that can be saved for a given handle before a restore must be initiated. Refer to the LIM/EMS documentation for more information on environment programming. Environment programming makes use of HANDLES, CONTEXTS, and DEPTH.
AUTOSIZE	This option must be used if you have a non-HP extension memory board.

Sample Command

```
DEVICE=C:\HPUTIL\HPEMM.SYS F=D000 HANDLES=200 INCLUDE=C800-CBFF
```

This tells the computer:

1. Look on drive C: in the HPUTIL subdirectory for the HPEMM file.
2. Set the page frame address to D0000.
3. Use 200 handles rather than the default of 255.
4. Include a page at C800.
5. You could map 64 KB + 16 KB (16 KB blocks at D000, D400, D800, DC00, and C800).

Finding Out How Much Expanded Memory You Have

When you turn on your computer, a message shows how much Total Memory, Base Memory, Reserved Memory, and Extended Memory you have. (Total Memory = Base + Reserved + Extended.) Since HPEMM 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 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.

```
 639K Base Memory
   384K Usable as Expanded Memory
 384K Reserved Memory
    96K Previously Allocated
   288K Converted to Expanded Memory
1024K Extended Memory
  1024K Converted to Expanded Memory
1312K Expanded Memory Available
```

Message Displayed After HPEMM is Loaded

1. **639K Base Memory:** MS-DOS and MS-DOS programs use memory between 0 and 640KB (1 KB is used by the mouse driver).
2. **384K Usable as Expanded Memory:** The amount of base memory (under 640K) usable as expanded memory by **environment programs** (not used by or available to **user programs**).
3. **384K Reserved Memory:** Memory between the MS-DOS area at 640K and the limit of (8086) addressable memory (1024 -640).
4. **96K Previously Allocated:** This is reserved memory that cannot be used because the BIOS and the video are shadowed.

5. **288K Converted to Expanded Memory:** The amount of reserved memory under the control of HPEMM.
6. **1024K Extended Memory:** The amount of extended memory located on the Memory Extension Board.
7. **1024K Converted:** All of the extended memory was converted to expanded memory. In some cases, another program might have previously claimed some of the extended memory for itself (normally all extended memory is available as expanded memory).
8. **1312K Expanded Memory Available:** The total amount of reserved memory and extended memory under the control of HPEMM (1024 extended + 288 converted to expanded).

Chapter 10 explains how memory operates. Error messages from HPEMM are listed in chapter 11, "Troubleshooting and Error Messages."

Some applications (Lotus 1-2-3 Release 3 for example) need extended memory in addition to base memory.

If you have only the standard 1 MB of memory (640 KB Base and 384 KB reserved) and you want to run such an application, use the setup option GBS to convert the 384 KB reserved memory to extended memory. (Refer to chapter 8.)

Using the HP Super VGA Utilities and Drivers

The utility programs include:

Utility	Description
HPVGAII.COM	Sets Screen Saver options and compatibility modes
HPANSI.SYS	Provides support for both extended and standard text modes
ESU.COM	(Enhancement Selection Utility) sets extended text and graphics modes
DIAG.EXE	Diagnoses problems that may occur with your video board
ALTPARM.COM	(Alternate Display Parameter) provides display parameters in addition to those included in the HP Super VGA BIOS
DU.COM	(Directory Listing Utility) displays directory information in as many columns as can be accommodated on the screen in the selected mode
CLR.COM	Clears the entire screen when you are using extended modes

In the following sub-sections, it is assumed that:

- Your MS-DOS system files are on your hard disk.
- You have installed the utilities in the HPVGA directory.

You can add the path (C:\HPVGA) to the utilities using the MS-DOS PATH command. You will not need to retype the path everytime you execute a command.

Using Screen Saver to Extend the Life of Your Display

Screen Saver is a utility included in the Utility Program HPVGAII.COM that prevents permanent damage to your screen by shutting it off after a specified period of inactivity. This prevents characters and images from being "burned" onto your screen. You can reactivate the screen by pressing any key (the Num Lock key is recommended).

The Screen Saver *should not* be used if you plan to:

- Use a mouse *instead* of a keyboard on a regular basis;
- Use Microsoft^{R} Windows/286;
- Use application software with which you use a joystick; or
- Use application software that shuts the screen off even when you are using the keyboard.

If you experience any display-related problems, turn off Screen Saver.

Note that you may also place the Screen Saver commands in your AUTOEXEC.BAT file so that they are executed every time you turn on your computer.

Setting Screen Saver Options

1. Change to the HPVGA directory where you installed HPVGAII.COM.
2. At the MS-DOS prompt, enter

   `C:\HPVGA\HPVGAII` *parameter* Enter

   parameter can be any of the following choices:

Parameter	Description
SAVE:ON	enables the screen saver feature
SAVE:OFF	disables the screen saver feature
SAVE:[*n*]	enables the screen saver feature for *n* minutes. The default setting for time elapsed is five minutes.
NOSAVE	disables the screen saver feature

VGA Compatibility Mode

Selecting a Compatibility Mode with the Utility Program HPVGAII.COM

If you find that an application does not run correctly, you may need to use the Utility Program HPVGAII.COM to make your video board emulate the type of board required by your application. HPVGA.COM allows you to emulate either a Color Graphics Adapter (CGA) or a Hercules Display Adapter. You can select the video mode to emulate either by using a menu or by entering commands at the MS-DOS prompt.

Selecting a Compatibility Mode from the HPVGAII Menu.

1. Change to the HPVGA directory where you installed HPVGAII.COM.
2. Start the Utility Program by entering:

   `C:\HPVGA\HPVGAII` Enter
3. Follow the instructions on the screen to select a video mode to emulate and to return to the MS-DOS system prompt.

Selecting a Compatibility Mode from the MS-DOS Prompt. Select a video mode to emulate by entering:

`C:\HPVGA\HPVGAII` *parameter* Enter

where *parameter* can be any of the following choices:

Parameter	Description
CGA:ON	selects color graphics emulation
CGA:OFF	turns off color graphics emulation (return to VGA)
MONO:ON	selects monochrome Hercules emulation
MONO:OFF	disables monochrome Hercules emulation (return to VGA)
MONO:HALF	selects 32 KB (one graphics page) monochrome emulation
MONO:FULL	selects 64 KB (two graphics pages) monochrome emulation
PURE:ON	enables *pure* IBM VGA standard modes, disables extensions. The HP Super VGA implements additional functions that go beyond the standard VGA functions. Some application software may not run correctly if it detects these additional functions. The PURE option allows such software to run correctly with the HP Super VGA.
PURE:OFF	enables both VGA *pure* mode and extensions

Placing Compatibility Mode and Screen Saver in AUTOEXEC.BAT. The AUTOEXEC.BAT file is run when the computer is turned on or reset using the Ctrl Alt Del keys. The HPVGAII program can be run to set compatibility mode from within the batch file.

Add the desired command or commands (using the syntax described above for the command line) to the batch file.

For example, to set Screen Saver for 10 minute delays before dimming the screen and also set CGA mode to ON:

```
C:\HPVGA\HPVGA SAVE:10
C:\HPVGA\HPVGA CGA:ON
```

Using HP Super VGA with a Monochrome Display

If you have a monochrome display, you may have difficulty with some color applications.

Your HP Super VGA controller automatically senses the type of display you are using. If you are using a monochrome display, the HP Super VGA automatically emulates a monochrome card. Some color-only application programs may have problems since all colors are displayed as shades of gray, and two colors may appear as the same shade of gray.

Caution

Using a color-only application with a monochrome display may result in some information not appearing in the display.

To reduce or eliminate these problems, use the HPVGAII program on the VIDEO UTILITIES DISK. Start the HPVGAII program (before starting your application) and select the option:

```
Switch to Color Mode
```

on the Select Monitor Type menu.

This resets the HP Super VGA circuitry to emulate color operation. The colors used by the application program should produce different shades of gray. When you finish using the color-only application, select:

```
Switch to VGA Monochrome
```

on the Select Monitor Type menu to return to standard monochrome display operation.

Using Standard and Extended Text Modes

Supporting Extended Modes With HPANSI.SYS

This utility provides support for extended as well as standard text modes, whereas the MS-DOS ANSI.SYS device driver only works with standard text modes (40 x 25 and 80 x 25).

When you "unpacked" your VGA Utilities and Drivers Diskette, the HPANSI.SYS file was copied to the directory you specified. However, you now need to modify your CONFIG.SYS file as follows:

1. Using an ASCII word processor or the MS-DOS TYPE command, check your CONFIG.SYS file for the command `DEVICE=[`*path*`]ANSI.SYS`
2. If it is there, delete the command, and replace it with the following:

   ```
   DEVICE=C:\HPVGA\HPANSI.SYS
   ```

   where HPVGA is the directory where you installed HPANSI.SYS.
3. Restart your computer by holding down Ctrl and Alt and pressing Del.

Note

You must use HPANSI.SYS if you will be using any of the extended video modes or any of the HP VGA utilities.

Changing Text and Graphics Modes (ESU.COM)

The Enhancement Selection Utility (ESU.COM) allows you to select different text and graphics modes from a menu or from the MS-DOS prompt.

Caution

Do not choose a video mode that your display is not capable of supporting. If you attempt to install a driver at a resolution higher than your display supports, you may cause damage to your display.

Selecting Text Mode from a Menu

1. **Change to the HPVGA directory where you installed ESU.COM.**
2. **At the MS-DOS prompt, enter:**

   ESU (Enter)

3. **Select the video mode that you want from the list displayed on your screen.** All HP VGA displays support all text modes selectable in the ESU.COM utility (0 to 45).
4. **Your particular software may not work in all text modes.** Read the instructions that came with your software for more information on supported text modes. Consult the documentation that came with your display for information on supported video graphics modes.

Selecting a Text or Graphics Mode from the MS-DOS Prompt

At the MS-DOS prompt, enter:

C:\HPVGA\ESU / [*mode number*] (Enter)

where *mode number* can be one of the values from the following table. (The values are in hexadecimal.) Modes 0 to 13 are standard modes, modes above 40 are extended modes and require HPANSI.SYS.

You may include the ESU / [*mode number*] command in your AUTOEXEC.BAT file, so it is executed when you start your computer.

Mode Number	Resolution	Colors	Monitors*	Type
0, 1	40 x 25	16	VFD, AD	Text
2, 3	80 x 25	16	VFD, AD	Text
4, 5	320 x 200	4	VFD, AD	Graphics
6	640 x 200	2	VFD, AD	Graphics
7	80 x 25	4	VFD, AD	Text
0D	320 x 200	16	VFD, AD	Graphics
0E	640 x 200	16	VFD, AD	Graphics
0F	640 x 350	4	VFD, AD	Graphics
10	640 x 350	16	VFD, AD	Graphics
11	640 x 480	2	VFD, AD	Graphics
12	640 x 480	16	VFD, AD	Graphics
13	320 x 200	256	VFD, AD	Graphics
40	80 x 43	16	VFD, AD	Text
41	132 x 25	16	VFD, AD	Text
42	132 x 43	16	VFD, AD	Text
43	80 x 60	16	VFD, AD	Text
44	100 x 60	16	VFD, AD	Text
45	132 x 28	16	VFD, AD	Text
60	752 x 410	16	VFD	Graphics
61	720 x 540	16	VFD	Graphics
62	800 x 600	16	VFD	Graphics
63	1024 x 768	2	ID	Graphics
64	1024 x 768	4	ID	Graphics
66	640 x 400	256	VFD, AD	Graphics

* Where:
VFD = Variable Frequency Display (Multi-Frequency Displays)
AD = Analog Display (the standard HP Video Graphics Color or Mono Display)
ID = Interlaced Display (Multi-Frequency Displays)

Improving Display Quality in Extended Video Modes with ALTPARM.COM

If any of the extended modes causes your screen to shift or change size, you can use the Alternate Display Parameter Utility to improve the quality of your display. The extended modes are the mode numbers greater than 40 (listed in the section "Selecting a Text or Graphics Mode from the MS-DOS Prompt").

Note that you will have to use the Alternate Display Parameter Utility every time you start or restart your computer. For this reason, you may want to place the ALTPARM command in your AUTOEXEC.BAT file.

1. Change to the directory where you installed ALTPARM.COM.
2. Look at the list of available display parameters by entering:

   `ALTPARM` Enter

   If your display is not listed, experimenting with the available parameters may improve your display quality.
3. Load the display parameter of your choice by entering:

   `ALTPARM [`*monitor-type*`]` Enter
4. To modify an existing setting, enter:

   `ALTPARM SETUP` Enter

   This option allows you to select a display, choose a resolution, modify the screen size, and save the modified version to a user-defined file.
5. To load the user-defined file, enter

   `ALTPARM USER [`*filename*`]` Enter

   where *filename* is the user-defined file.

Using the Diagnostics Program (DIAG.EXE) to Identify Problems

To help you identify problems that may occur with your video controller, run the Diagnostics Program (DIAG.EXE).

1. Change to the directory where you installed DIAG.EXE.
2. At the MS-DOS prompt, enter:

   DIAG (Enter)

The program displays:

- Amount of video memory available to the HP Super VGA
- HP Super VGA BIOS date/version
- Switch settings (not used on the HP Vectra 286/12)
- Co-resident graphics adapter (if installed)

It also displays a series of self-explanatory screens demonstrating and testing various attributes and capabilities of the HP Super VGA.

If the Diagnostics Program indicates a problem, or if any of the screens appear to be incorrect, refer to chapter 11, "Troubleshooting and Error Messages."

Using the Directory Listing Utility (DU.COM)

This utility takes advantage of extended resolution and displays from 50 to 129 entries at a time, depending on your chosen resolution—whereas the MS-DOS DIR command displays 25 entries at a time. You can use DU.COM in any video mode; modes 40 and above however require HPANSI.SYS.

You may want to include the directory where you installed DU.COM in the search path in your AUTOEXEC.BAT file, or copy the utility to a directory already in the search path.

To display directory information, at the MS-DOS prompt enter:

`C:\HPVGA\DU` *parameter* Enter

where *parameter* can be any of the following choices:

Parameter	Description
DU	all files in the current directory
DU *myfile**.*	all files in the directory *myfile*
DU /D	all sub-directories
DU /H	files including hidden files
DU /S	files including system files

To *stop* the display of the directory entries, press Esc.

To stop the display of the directory entries *temporarily,* press any key *except* Esc. To resume scrolling, press any key.

Clearing the Screen with the Enhanced Mode Clear Screen Utility (CLR.COM)

The Enhanced Mode Clear Screen Utility allows you to clear your entire screen in any text mode. Some enhanced video modes display information on as much of the screen as possible–while the MS-DOS CLS command only clears a portion of this area, the Enhanced Mode Clear Screen Utility clears the entire screen. For modes greater than 40, HPANSI.SYS must be installed.

You may want to include the directory where you installed CLR.COM in the search path in your AUTOEXEC.BAT file, or copy the utility to a directory already in the search path.

To clear the entire screen:

1. Change to the directory where you installed CLR.COM.
2. At the MS-DOS prompt, enter:

   CLR (Enter)

Using the Software Application Video Drivers

You must unpack the drivers as described in "Installing the Utilities from the HP Super VGA Diskette" before you can use them.

The HP Super VGA supports extended video modes in addition to the VGA standard. To use any of these extended modes, you must first install a software driver that was designed to support the particular application program that you want to use.

Software drivers for the following applications are provided on the HP Super VGA Utilities and Drivers Disk.

- AutoCAD Release 9 and 10 (includes AutoShade)
- GEM/3 versions 3.1 and 3.0
- Generic CADD Level 3
- Lotus 1-2-3 versions 2.x and Symphony
- P-CAD versions 3.0 and 4.0
- Ventura Publisher versions 1.x and 2.0
- VersaCAD Design versions 5.3 and 5.4
- Windows/286 versions 2.x 16-color modes
- Windows/286 versions 2.x 256-color modes
- Word Perfect 4.2 and 5.0
- WordStar 3.3 (4.0 and 5.X include drivers)

Note

When installing the drivers, remember that your display must be able to support the resolution you choose. If you attempt to install a driver at a resolution higher than your display supports you may cause damage to your display. Refer to the section "Changing Text and Graphics Modes with ESU.COM" for a list of text and graphics modes.

Before you begin to use the drivers, we recommend that you read the README file for the latest information about the HP Super VGA drivers. From the directory where you unpacked the utilities and drivers, enter:

```
README Enter
```

AutoCAD Releases 9 and 10

The HP Super VGA supports the following resolutions:

Resolution	Colors
640 x 350	16 colors
752 x 410	16 colors
640 x 480	16 colors
720 x 540	16 colors
800 x 600	16 colors
1024 x 768	4 colors

The AutoCAD driver REL10.COM supports ADI Version 3 and above interfaces, AutoShade and AutoSketch, and Fast Vector and Packet modes. The Release 10 driver also supports Release 9.

When you unpacked your HP Super VGA Utilities and Drivers Disk, the files were copied to the AUTOCAD subdirectory of the HPVGA directory you specified.

Installing AutoCAD ADI. Refer to the table in the previous section, "AutoCAD Releases 9 and 10", for resolutions supported.

The AutoCAD ADI driver comes with one AutoCAD display driver and an installation program.

To install the ADI General Display Driver:

1. Change to the HPVGA directory where you unpacked the utilities and drivers.
2. Change to the AUTOCAD subdirectory, and at the MS-DOS prompt, enter:

   `REL10` (Enter)

You must load the driver every time you start your computer. Or you can add the above command to your AUTOEXEC.BAT file so that it is executed every time you turn on your computer.

Configuring AutoCAD ADI. You need only configure AutoCAD for the ADI General Display Driver once. AutoCAD remembers that it has been installed.

1. Start AutoCAD as described in the AutoCAD documentation.
2. At the main menu, select **`Configure AutoCAD`**.
3. Review your current configuration and press (Enter).
4. Select **`Configure Video Display`** and select ADI by pressing `Y`, and then pressing `1`.
5. AutoCAD asks you a series of questions on options. Answer questions, referring to the *AutoCAD Installation and Performance Guide* for more information, if necessary.
6. Press `Y` to save the configuration.

Using AutoCAD ADI Installation Program (INST.EXE). Use the installation program, INST.EXE, to

- Change the currently selected resolution of AutoCAD's graphics screen,
- Modify the software interrupt vector used by AutoCAD to communicate with the ADI display driver; and
- Modify the colors used in several areas of the AutoCAD graphics screen.
- To run the Install Program: change to the directory where the files are located, and at the MS-DOS prompt, enter:

  `INST` (Enter)

- Select the default driver, `REL10.COM`.
- Select the default interrupt vector number, `7A`. (You only need to change the interrupt vector if the default value conflicts with other software you are using.)
- Select the AutoCAD resolution you want. (Refer to "Changing Text and Graphics Modes with ESU.COM " for more details.)
- Select the AutoShade rendering resolution you want. (Refer to "Changing Text and Graphics Modes with ESU.COM" for more details.)
- Select the AutoCAD color model, either release 9 or 10, depending on which release you have.
- Select the configuration data. (You can change the number of command lines, the screen colors, the palette colors, and the 256 color settings.)

Configuring AutoShade ADI. The HP Super VGA supports 320 x 200 and 640 x 400, both with 256 colors.

Run AutoShade using the AutoShade documentation. Following the instructions on the screen:

1. Select **AutoDesk Device Interface Rendering Driver** from the Display Devices selection.

   You should initially use the interrupt vector **7Ah**, and it should be the same as the interrupt vector you configured the ADI driver to.

2. Select **AutoDesk Device Interface Rendering Driver** from the Rendering Display Devices selection.

   Use the default **7Ah** interrupt driver as described above.

3. Select **YES** to the question "Do display and rendering devices share a single screen?"

4. Select **NO** to the question "Does the FLIPSCREEN require a redraw?"

Using AutoCAD in Dual Screen Mode. You can use AutoCAD in dual screen mode if you have a monochrome display and video board in your computer, in addition to the HP Super VGA.

Note

In dual screen mode, the HP Super VGA must be configured for a resolution other than 1024 x 768 with 2 colors. You cannot have a monochrome video board co- resident when the HP Super VGA is configured for this mode.

To use the dual screen mode, your monochrome display and video board must be active before starting AutoCAD. If it is not already active, at the MS-DOS prompt enter:

```
MODE MONO (Enter)
```

The REL10.COM driver will automatically configure AutoCAD for dual screen mode.

GEM/3 Versions 3.1 and 3.0

The HP Super VGA supports the following resolutions:

Resolution	Colors
640 x 480	16 colors
720 x 540	16 colors
800 x 600	16 colors

These instructions assume that you have already installed GEM/3.

1. Insert the GEM/3 System Master Diskette in drive A, and enter:

   GEMSETUP (Enter)

2. Select **Change Existing Configuration**. Your current configuration will be displayed. Select **Continue** and then select **Change Your Current Setup**.
3. When you are asked for the Graphic Board and Display installed in your system, select **Other (Driver Pack)**.
4. When asked for the GEM Driver Pack Diskette, insert the HP Super VGA Utilities and Drivers diskette and select **Continue**.

   You will first see a **Busy** message, and then a list of Graphics Boards and Displays including the HP Super VGA drivers.
5. Select the mode you wish to install. Your new configuration will be displayed.
6. Select **Save and Exit** and follow the instructions on the screen.

Generic CADD Level 3

The Generic CADD program provides support for the 800 x 600 16-color mode. The HP Super VGA does not support Generic CADD in the 1024 x 768 16-color resolution which requires 512 KB of memory.

When you unpacked your HP Super VGA Utilities and Drivers, the file GCAD1024.VGD was copied to the subdirectory GENCAD in the HPVGA directory you specified.

1. Change to the HPVGA directory where you unpacked the files.
2. Change to the subdirectory GENCAD.
3. Copy the driver file from the GENCAD subdirectory to the directory where the Generic CADD program resides.
4. Change to the directory where the Generic CADD program resides.
5. At the MS-DOS prompt, run the Generic CADD CONFIG program by entering:

   `CONFIG` Enter
6. Follow the instructions on the screen to select the `HP Super VGA 1024 x 768 16-color` driver.
7. Exit CADD CONFIG and run Generic CADD as usual, using the Generic CADD documentation.

Lotus 1-2-3 Versions 2.x and Symphony Version 1.2

The HP Super VGA supports the following resolutions:

File Name	Resolution	Colors	Monitors*	Type
VD132x25.DRV	132 x 25	16	VFD,AD	Text
VD132x43.DRV	132 x 43	16	VFD,AD	Text
VD100x60.DRV	100 x 60	16	VFD,AD	Text
VD80x60.DRV	80 x 60	16	VFD,AD	Text
GD720V20.DRV	720 x 540	16	VFD	Graphics
GD800V20.DRV	800 x 600	16	VFD	Graphics

* Where:
VFD = Variable Frequency Display
AD = Analog Display

When you unpacked your HP Super VGA Utilities and Drivers, the above Lotus driver files were copied to the subdirectory LOTUS in the HPVGA directory you specified.

1. Copy the Lotus drivers from the subdirectory LOTUS to the HPVGA directory where your Lotus application resides.
2. From the directory where your Lotus application resides, enter:

   `INSTALL` (Enter)
3. Follow the instructions on the screen to go to the Main Menu. Select **Advanced Options**, then select **Add New Drivers to Library**. Follow the instructions on the screen to add drivers.
4. Return to the **Advanced Options** menu. Select **Modify Current Driver Set**, then select **Graphics Display**.
5. Select the driver that you wish to install from the list.
6. Select **Save Changes**.
7. Follow the instructions on the screen to name the new driver or to make it the default driver and complete the installation.

P-CAD Versions 3.0 and 4.0

The HP Super VGA supports the following resolutions:

Resolution	Colors
640 x 480	16 colors
720 x 540	16 colors
800 x 600	16 colors

When you unpacked your HP Super VGA Utilities and Drivers, the P-CAD driver files were copied to the HPVGA directory you specified.

1. Install P-CAD using the documentation that came with it.
2. Select **IBM VGA** as the display adapter.
3. When you have completed the installation, change to the P-CAD driver sub-directory by entering:

   `CD \PCAD\DRV` Enter

4. *Either* Rename the IBM VGA driver to save it for future use, by entering:

   `RENAME DIBMVGA.DRV` *newfile* Enter

   where *newfile* is the name of your new IBM VGA driver file

   Or delete the IBM VGA driver, by entering:

   `DEL DIBMVGA.DRV` Enter

5. Go to the HPVGA directory where you installed the drivers and copy the P-CAD driver for the resolution you wish to install to the PCAD\DRV directory.
6. Use an ASCII word processor or text editor to modify the P-CAD configuration file PCADDRV.SYS as follows: Delete the line **DIBMVGA.DRV** and replace it with the name of the file for the resolution you are installing. For example, if you are installing the 800 x 600 resolution mode, you would delete **DIBMVGA.DRV** and replace it with **DPCAD800.DRV**.
7. Restart your computer for the changes to take effect.

Ventura Publisher Versions 1.x and 2.0

The HP Super VGA supports the following resolutions:

Resolution	Colors
640 x 480	2 or 16 colors
720 x 540	2 or 16 colors
800 x 600	2 or 16 colors

The Ventura Publisher driver files are located on the HP Super VGA Utilities and Drivers diskette.

1. Install Ventura Publisher as described in the documentation that came with it. Select the VGA display device driver.
2. When you have completed the installation, change to drive A and insert the HP Super VGA Utilities and Drivers Diskette.
3. Enter

   ```
   VPINST_1
   ```

   for Ventura Publisher Versions 1.x, OR

   ```
   VPINST_2
   ```

   for Ventura Publisher Version 2.0
4. Follow the instructions on your screen.

VersaCAD Design Versions 5.3 and 5.4

The HP Super VGA supports the following resolutions:

File Name	Resolution	Colors
VCAD800.EXE	640 x 480	16 colors
VCAD800.EXE	720 x 540	16 colors
VCAD800.EXE	800 x 600	16 colors

When you unpacked your HP Super VGA Utilities and Drivers, the above VersaCAD Design driver files were copied to the subdirectory VERSACAD in the HPVGA directory you specified.

There are two resolution files and two configuration files. The configuration file VCAD53.CFG is for VersaCAD Design Version 5.3, and VCAD54.CFG is for VersaCAD Design Version 5.4.

Note

The instructions below assume you have already installed VersaCAD Design Version 5.3 on your hard disk in a directory called VCAD53. If you have VersaCAD Design Version 5.4, replace all references to VCAD53.CFG with VCAD54.CFG.

1. Change to the HPVGA directory where you installed the HP Super VGA drivers.
2. Change to the subdirectory VERSACAD.
3. Copy the resolution file that you wish to install to the VersaCAD directory of your hard disk. For example, to install the 640 x 480 resolution driver, you would enter:

   ```
   COPY VCAD800.EXE \VERSACAD Enter
   ```

4. Copy the configuration file to the VERSACAD directory by entering:

   ```
   COPY VCAD53.CFG \VERSACAD Enter
   ```

5. Using a word processor or text editor, modify the VersaCAD batch file VCAD53.BAT (usually in the root directory of your hard disk) to include the resolution file name you used in step 2. For example, you would modify your VersaCAD batch file to look like this:

   ```
   CD \VCAD53
   VCAD800
   VRUN
   ```

6. Change to the VCAD53 directory and start VersaCAD.
7. Select **E** to change the screen configuration.
8. Select the desired resolution.

Windows/286 Version 2.x

The HP Super VGA supports the following resolutions:

Resolution	Colors
640 x 400	256 colors
640 x 450	16 colors
640 x 480	16 colors
720 x 540	16 colors
800 x 600	16 colors
1024 x 768	2 colors

1. Run the Windows/286 setup program using the Windows/286 documentation. The Windows/286 setup program automatically detects your system configuration.
2. Select `VGA`, then select `Other` to install the HP Super VGA drivers.
3. Follow the instructions on the screen. When prompted, specify the path to the directory and subdirectory where you unpacked the utilities and drivers. The drivers are in the C:\HPVGA\WIN286 subdirectory.

   The more colors you use, the slower the screen updates will be. If you do not require 256 colors, we recommend installing the 16-color driver for best performance. Higher screen resolutions also slow down screen updates.
4. Windows automatically loads the available drivers. Select the driver you wish to be active from the list on the screen.

Note

If you attempt to install Windows/286 at a resolution higher than your display supports you may cause damage to your display. Refer to the section "Changing Text and Graphics Modes (ESU.COM)" for text and graphics modes supported by the HP Super VGA.

---

5. Select the fonts you wish to use. We recommend that the VGA fonts be used for all of the HP Super VGA Board drivers.
6. Complete the installation by following the Windows setup instructions.

WordPerfect Version 4.2 and 5.0

The HP Super VGA supports the following resolutions:

Resolution	Colors	Type	Version
132 x 25	16 colors	text	4.2, 5.0
132 x 43	16 colors	text	4.2, 5.0
100 x 60	16 colors	text	4.2, 5.0
800 x 600	16 colors	graphics	5.0

When you unpacked your HP Super VGA Utilities and Drivers, the WordPerfect driver files were copied to the subdirectory WRDPERF in the HPVGA directory you specified.

Installing Text Drivers for Version 4.2.

Note

Before you run WordPerfect, you must run ESU.COM to select the text mode for which you have configured WordPerfect. Refer to the section "Changing Text and Graphics Modes with ESU.COM."

1. Go to the WordPerfect directory, and display the WordPerfect SETUP menu by entering:

   `WP/S` Enter

2. Select `Display`
3. Select `Set screen and beep options`
4. Follow the instructions on the screen to enter the number of rows and columns you want. Press Enter until you return to the SETUP menu.
5. Press Enter twice.

Installing Text and Graphics Drivers for Version 5.0.

1. Copy the WordPerfect Graphics drivers from the HPVGA\WDPERF directory where you installed the drivers to the WordPerfect directory on your hard disk.
2. Go to the WordPerfect directory and display the WordPerfect SETUP menu, by typing:

   WP (Enter)
3. Hold down the (Shift) key and press (F1).
4. Select **Display**, then select **Graphics Screen Type.**
5. Select the resolution you wish to use by highlighting it first, hten marking it with an asterisk (*).
6. Press (Enter) twice.

WordStar 3.3

These instructions assume you have already installed WordStar 3.3 on your computer.

When you use the WSSETUP command, as described below, to select a resolution, you modify your WordStar program. We therefore recommend that you first make a copy of your WordStar program.

For example, to make a copy of your WordStar program called WS132.COM, from your original WordStar directory, you would enter:

```
COPY WS.COM WS132.COM Enter
```

To select the drivers for WordStar:

1. Change to the HPVGA directory where you unpacked the utilities and drivers. (Refer to chapter 2, if necessary.)
2. Change to the WS33 subdirectory and enter:

   ```
   WSSETUP Enter
   ```

3. Select the resolution you want from the list on the screen, by entering:

   WSSETUP *resolution path*\WS132.COM

   where *resolution* is the resolution number from the list displayed on the screen and *path* is the path to your new WordStar program, WS132.COM.

For example, in the following command

```
WSSETUP 1 \WORDSTAR\WS132.COM
```

1 is the resolution number of the resolution you want, **WORDSTAR** is the path to your WordStar program, and **WS132.COM** is your new WordStar program.

Note

If you are using WordStar in 43 line mode, do not select **EGA 43** line mode from the WordStar Monitor Selection menu. Use the Console Screen Size menu to set the number of rows and columns instead.

---

4. Use the Enhancement Selection Utility (ESU.COM) to choose the text mode that you want. Refer to the section "Changing Text and Graphics Modes (ESU.COM)" for instructions.

WordStar Professional Versions 4.0 and 5.x

1. Use the WordStar documentation and the WSCHANGE program to configure WordStar 4.0 or 5.x for use with the HP Super VGA extended modes.
2. Run ESU.COM to select the mode you set in step 1. Refer to the section "Changing Text and Graphics Modes (ESU.COM)" for instructions.

10

Using Your HP Vectra 286/12 PC

Controlling Computer Functions

This section explains how to:

1. Change the processing speed of your computer
2. Change the volume of your keyboard click
3. Change the typing speed
4. Enable/disable the mouse
5. Cancel MS-DOS commands
6. Restart your computer
7. Type extended characters

Changing the Processing Speed of Your Computer

The HP Vectra 286/12 PC supports multiple speeds: a high speed of 12 MHz, and a low speed of 8 MHz.

Your computer 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 either of the following methods.

- **Method 1:** Using the EXMODE command (only under MS-DOS)
- **Method 2:** Using the SETUP program

EXMODE and SETUP are on the SETUP AND UTILITIES DISK supplied with your computer.

Method 1: Using the EXMODE Command to Change the Processing Speed

The syntax for using EXMODE to change the processing speed is:

*drive:**path*\EXMODE SPEED *speed* Enter

where:

drive	is the drive that contains the EXMODE command (C:)
path	is the path to the EXMODE command (HPUTIL)
speed	is the processing speed—possible values are: HIGH (for 12 MHz), FAST or LOW (for 8 MHz), AUTO (12 MHz with automatic switch to 8 MHz for diskette, or other I/O, access). If you do not specify a speed, the current setting is displayed.

The selected speed remains in effect until you restart your computer.

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

- Type the EXMODE SPEED command at the MS-DOS prompt. For example, to change the speed from HIGH to LOW, type

  C:\HPUTIL\EXMODE SPEED LOW Enter

- Or, create a batch file that lowers the speed by issuing the EXMODE SPEED command, starts the application, and returns the the computer back to its high speed when you exit the application. For example:

```
C:\HPUTIL\EXMODE SPEED LOW
APPLIC.EXE    - replace this line with the name of your program
C:\HPUTIL\EXMODE SPEED HIGH
```

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

Method 2: Using the SETUP Program to Change the Processing Speed

You can set the default speed (the speed in effect when the PC is first turned on) using the SETUP program. Refer to chapter 8.

Changing the Volume of the Keyboard Click

Method 1: Using the EXMODE Command to Change the Click Volume

EXMODE is an MS-DOS command utility on the SETUP AND UTILITIES DISK supplied with your computer. EXMODE can be used to temporarily change the volume of the keyboard click. The syntax for using EXMODE to change the keyboard click volume is:

*drive:**path*\`EXMODE CLICK` *volume* (Enter)

where:

drive	is the drive that contains the EXMODE command. (C:)
path	is the path to the EXMODE command. (HPUTIL)
volume	is a number between 0 and 15 for the click volume. 0 is inaudible and 15 is maximum volume.

The selected volume remains in effect until you restart your computer.

Method 2: Using the SETUP Command to Change the Click Volume

You can set the default keyboard click volume (the volume in effect when the PC is first turned on) using the SETUP program. Refer to chapter 8.

Changing the Typing Speed

You can control the keyboard typing speed and the default state of the (NumLock) key (numeric mode or cursor control mode) using the SETUP program. Refer to chapter 8.

Enabling/Disabling the Mouse

The mouse driver utilities must be installed and the mouse enable switch must be OFF (enabled) for the mouse to operate (refer to the documentation that came with your mouse, chapter 9 and appendix A.).

Canceling an MS-DOS Command

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

You can also use Esc, or delete the command using Backspace.

To cancel an MS-DOS command *after* you press Enter, hold down Ctrl and press C.

Restarting Your Computer

To restart your computer, hold down Ctrl and Alt, and simultaneously press Del. 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

Do NOT restart your computer when you are in an application program as you will lose the data you have not saved to disk.

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. Use the Alt key—*not* AltGr (found on non-U.S. keyboards).

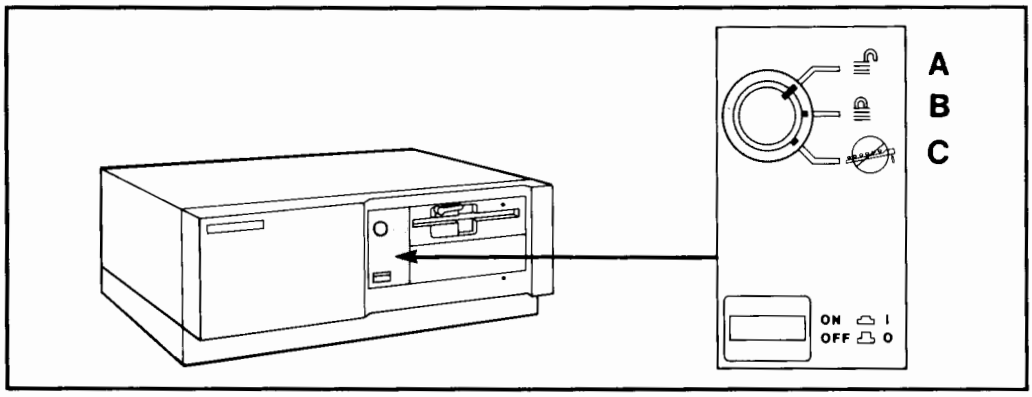
You can find tables of supported characters (which may also be referred to as code pages) in your MS-DOS reference manual.

Controlling Computer Security

The Security Lock

Your computer can be fitted with a security lock to prevent unauthorized use. There are three positions available on the lock:

Keyboard and cover unlocked (A)	The computer will function and the cover can be removed.
Cover locked (B)	The computer will function but the cover cannot be removed.
Keyboard and cover locked (C)	The keyboard will not function, but otherwise the computer will continue to function (until a request for keyboard input is required).



The Power-On and Network Server Mode Password

You can set an optional password for your computer when you run the SETUP program. The SETUP program will guide you through this process with on-screen menus. (Refer to chapter 8 for details.) There are two modes for password operation: Power-on and Network Server Mode.

Power-On Mode

Use the SETUP program to set the password. To use the power-on mode only, enter [N] when asked if you want to set network server mode.

Once you have set your password, whenever you turn on or restart the computer, the password prompt (a key icon) will prompt you to enter the password. The characters you type will not appear on the screen.

You have three chances to enter the password. After three unsuccessful tries, you must restart the computer before you can try again.

Note

You must use the same keys to type in your password every time. Note that the keys on the top of the keyboard are not the same as the keys on the numeric keypad.

Changing the Power-On Password

1. **To change your current power-on password,** at the password prompt enter:

   oldpassword/newpassword

   In this example, *oldpassword* is your current password and *newpassword* is the new password you want to use. If you do not enter a new password, that is, if you press [Enter] immediately after [/], the existing password will be cancelled.

Note

Type carefully when you enter the new power-on password. The characters you enter will not appear on the screen and you cannot retype the password if you make a mistake.

---

2. **Restart your computer.** Press [Ctl] + [Alt] + [Del] simultaneously.

Network Server Mode

Use the SETUP program to enter the password as described above, but when asked if you want network server mode, enter Y.

In network server mode, the computer can operate as a network server (that is, without an operator). The computer functions but the keyboard is locked until the password is entered.

When you start the computer, it will begin executing the instructions in the AUTOEXEC.BAT file immediately rather than first requesting the user to enter the password. This is done because the computer may be restarted by a power failure and there won't be an operator present to type in the password. However, the password must still be entered before you can use the computer's keyboard.

When the network server mode is set and the password has not been entered, the keyboard entries are ignored; that is, characters typed do not appear on the screen. Unlike the power-on mode, there is not a prompt for the password or an error message for having entered an incorrect password.

Once you have enabled the keyboard by typing in the password, you will be able to enter commands at the MS-DOS prompt. Characters you type after the password will appear on the screen. You can prevent futher use of the keyboard by turning the security lock to the keyboard locked position or by restarting your computer.

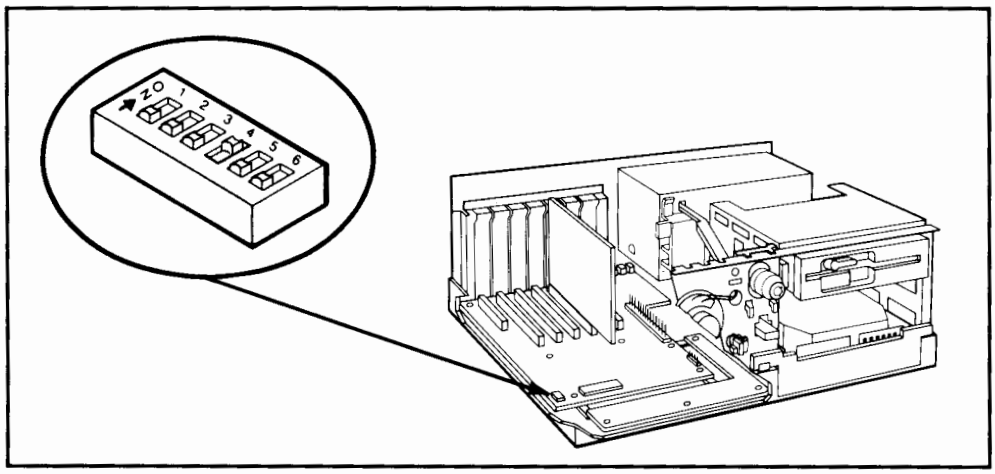
Changing the Network Server Mode

Once you have set network server mode, you must run the SETUP program again if you want to change to power-on mode or change the password itself.

Turning Off the Password Feature

If you forget your password, or wish to temporarily shut off the password feature, you must clear the password from the computer's memory. You do this by disabling the password feature using a switch on the system board. Disabling the password feature disables both the power-on and the network server modes.

1. **Turn off your computer and disconnect all cables and power cords.**
2. **Make sure your security lock is in the "keyboard and cover unlocked" position.**
3. **Remove the cover.** (Refer to chapter 2.)
4. **Set switch 4 to ON .**



5. **Replace the cover.** (Refer to chapter 2.)
6. **Connect all cables and power cords.**

To *enable* the power-on password feature, simply repeat the process described above, but set switch 4 to OFF. Then run the SETUP program again to set the power-on password (and optionally the network server mode).

Optimizing Your Computer's Performance

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

- Set your computer to run at its highest speed whenever possible. (Refer to "Changing the Processing Speed of Your Computer".)
- Increase the amount of RAM available to your computer by adding memory modules to the memory board. (Refer to chapter 4.)
- If your computer has more than one hard disk drive, install your operating system on the largest, or highest capacity, hard disk drive.
- Use a file defragmenting utility to recover lost disk space caused by fragmented files. Fragmented files can result in lower performance.

Caution

Do not run a defragmenting utility when you are using memory resident programs such as disk cache. The defragmenting utility moves data around and it can cause problems when the disk cache looks for information that has been moved to a new location.

- Use a disk optimization utility to place frequently used files in close physical proximity to each other. This reduces the frequency with which the head needs to search the disk in order to find your files.
- Optimize MS-DOS by using the HP Expanded Memory Manager (HPEMM).
- If you do a lot of numerical calculations, add a coprocessor to your computer. (Refer to chapter 5).

Using Additional Memory

Your computer can use the following types of memory:

- **Base memory** is memory with an address from 0 to 640 KB (K when referring to memory is the number 1024, therefore 640 K is the number 655360, KB refers to 1024 bytes of memory).

  Base memory is the memory used by MS-DOS applications to store programs and data. The upper boundary is not determined by the number of memory modules installed but by the original definition of MS-DOS.

- **Reserved memory** is located between 640 KB and 1 MB (1 M is 1K x 1K or 1048576 bytes). Most applications using current versions of MS-DOS use reserved memory to control the video screen and other computer operations.

- **Extended memory** is any memory with an address higher than 1 MB. Most MS-DOS applications *cannot* directly use extended memory for programs or data. (An exception is Lotus 3.0.) This is because the processor chip originally used in personal computers was only able to address 1 MB of memory.

- **Expanded memory** originally was a way to **expand** the memory capacity of the 8086 and 8088 based computers.

  In modern 80286 (your HP Vectra 286/12), 80386, and 80486 computers, expanded memory is created from portions of your computer's base, reserved, and extended memory by an expanded memory manager program, such as the HP Expanded Memory Manager.

  With expanded memory, your computer makes the program code and data stored in previously inaccessible locations available to MS-DOS programs which are written to LIM-EMS 4.0 or earlier. The mechanism of expanded memory was developed to allow the older PCs to run larger programs while still following the 1 MB addressing limit. (The newer processors such as the 80286, 80386, and 80486 are able to directly address much larger blocks of memory.)

Extended memory is additional memory placed in a computer designed to hold additional memory while expanded memory is additional memory placed in a computer that was not originally designed to hold additional memory. To

maintain compatibility with older computers, the HP Vectra 286/12 PC can treat its extended memory as expanded memory.

How Does an Expanded Memory Manager Work?

Once expanded memory is created using the HPEMM expanded memory manager, LIM-EMS software can store programs and data there in 16 KB blocks (called "pages").

Traditional MS-DOS applications can only access memory up to 640 KB. Applications written to LIM-EMS version 4.0, however, can access memory between 640 KB and 1 MB by mapping it to certain addresses between 640 KB and 1 MB. In addition, it allows applications to map program code and data to addresses below 640 KB.

As pages of information in expanded memory are needed by your MS-DOS application, HPEMM finds unused addresses under 1 MB and maps (or "switches") the needed pages to these addresses. The pages can then be used by the application because they now have an address less than 1 MB.

Switching is done continually as pages in expanded memory are needed by the application. All of this switching takes place "behind the scenes".

Adding More Memory to Your Computer

As your computing needs become more demanding, you may find it necessary to add to the existing memory of your computer. The system board (the main board in the computer) is already full and additional memory must be placed in the Memory Extension Board. This board has space for an additional memory to provide up to 8 MB.

More memory is better. For MS-DOS users, increased memory means 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 MS-Windows for the HP Vectra PC. For MicroSoft Operating System/2 users, it will allow you to multitask large protected mode programs.

Refer to chapter 4 for information on installing the memory board and additional memory modules.

The Coprocessor

A numeric coprocessor will significantly increase the speed of floating-point intensive applications that support an Intel's 80287 coprocessor. Examples of programs that can benefit from a coprocessor are Lotus®1-2-3 ® and Autodesk's AutoCAD®.

Refer to chapter 5 for information on how to install a coprocessor.

Configuring Your Computer for High Performance

- If you have MS-DOS 3.3, use the MS-DOS Utility FDISK 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 your MS-DOS documentation for information about partitioning your hard disk and installing your operating system.
- Ensure that shadowing is enabled for the BIOS, Option, and VGA ROMs. Use the SETUP program with command line switches GBS, ORS, and VBS. Refer to chapter 8 for information on the SETUP program.
- MS-DOS 4.0 users should ensure that the HPDCACHE disk cache program is installed in extended or expanded memory. (MS-DOS 3.3 users should use the HPCACHE program.) Disk cache can increase performance, depending on the application.

  Putting the cache in extended memory is significantly faster for most applications. Setting block moves (/B+ flag in command line of HPCACHE or HPDCACHE) allows data to be copied to and from the cache in batches of sectors.
- MS-DOS 4.0 users should set the disk cache size between 256 and 1024 KB. For example, HPDCACHE /E /B+ would create a 256 KB cache in extended memory with batch transfers enabled. To adjust the HPDCACHE 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. The HPDCACHE program is located on the MS-DOS diskette. (Use the HPCACHE program with the same options for MS-DOS 3.3.)

Note

The /E /B+ parameter may interfere with some communications programs at 2400 baud or higher. If you experience problems with your programs, either disable batch transfers or place the CACHE program (HPDCACHE or HPCACHE) in expanded memory (/A+).

- Use the SETUP or EXMODE program to ensure that the processing speed is set to the highest speed supported by your computer (Refer to "Changing the Processing Speed of Your Computer").
- Adjust the number of MS-DOS buffers. This is controlled by a line in the CONFIG.SYS file in the root directory of drive C.

  MS-DOS buffers act like a disk cache in base memory. If you do not have HPDCACHE installed, more buffers will improve disk performance, but may decrease computer/memory subsystem performance because they are using up base memory. There is an optimum number of buffers for every application and workload. Start with a value between 5 (for large disk volumes) and 30 (small disk volumes) and experiment by increasing and decreasing it.

  HPDCACHE performs a similar function as the buffers mentioned above, but is more efficient. Therefore, if you have the HPDCACHE program installed, reduce the number of buffers to 5 or 10. (The same instructions apply for the HPCACHE program on MS-DOS 3.3)

Note

Set the buffer size by using the BUFFERS= command in the CONFIG.SYS file. You must restart your system by pressing Ctrl, Alt, and Del simultaneously for changes in the CONFIG.SYS buffer value to take effect.

11

Troubleshooting and Error Messages

The Computer Does Not Work: No Error Messages

1. **Check that the computer and display are turned ON.**
2. **Check that the monitor's contrast and brightness settings.**
3. **Make sure that all cables and power cords are firmly plugged in.**
4. **Make sure the power outlet is working.**
5. **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. (Refer to chapter 2.)
   d. Check that all accessory boards are firmly seated in their slots.
   e. Check that memory modules (if used) are correctly installed.
   f. Check that the coprocessor (if used) is correctly installed.
   g. Verify that any switches and jumpers on the boards are properly set (refer to the manuals that came with each board).
   h. Replace the cover.
   i. Connect all cables and power cords.
   j. Turn on the display and computer.
6. **If your computer still does not work, remove all boards and accessories except the hard disk drive and controller.** Start your computer. If your computer now works, add your boards and accessories one at a time to determine which one is causing the problem.

Your Application Does Not Work Properly

- **Check to see what speed your application needs** to run at and adjust your processing speed if necessary. Refer to chapter 10, "Controlling Computer Functions" for more information about switching processing speed.)
- **Refer to your application's user manual.**

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 your printer is configured correctly for your computer, and for your application.**
7. **Check that your computer's port is working properly by running another peripheral connected to the port.**
8. **If you receive an error message on your display, go to your printer's manual for help.**

The Display Does Not Work or Your Screen is Blank

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 in and 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. **Verify that your video mode is properly configured.** (Refer to chapter 9.)
6. **Inspect the Disable Video switch to ensure it is in the correct position.** The location of system board switches is given at the end of appendix A.
7. If you are using the HP Super VGA utility Screen Saver and your screen goes blank while you are using the keyboard, you may be using an application that turns off the screen even when you are using the keyboard. To disable Screen Saver, refer to the chapter 9.

Software Problems

If the screens generated by your applications don't look right:

- **Your application may not automatically adapt to the VGA standard if you are using a monochrome monitor.** Run the HPVGAII.COM program and select the video mode manually.
- **Check your application manual to find out which video standard is required.** Use the HPVGAII.COM program to select the required standard.

The HPVGAII.COM program is on the VGA Utilities Disk and is described in the "Using the HP Super VGA Utilities" section in chapter 9.

How To Tell If the Battery Pack Should Be Replaced

The battery pack in your computer maintains the correct date and time when your computer is turned off. It also preserves the system configuration settings in memory. When the battery pack wears out (every three to five years), you will see this message when you turn on the computer:

```
Invalid configuration information -
Run configuration utility (SETUP)
Strike F1 to continue
```

You should replace the battery pack as soon as it wears out.

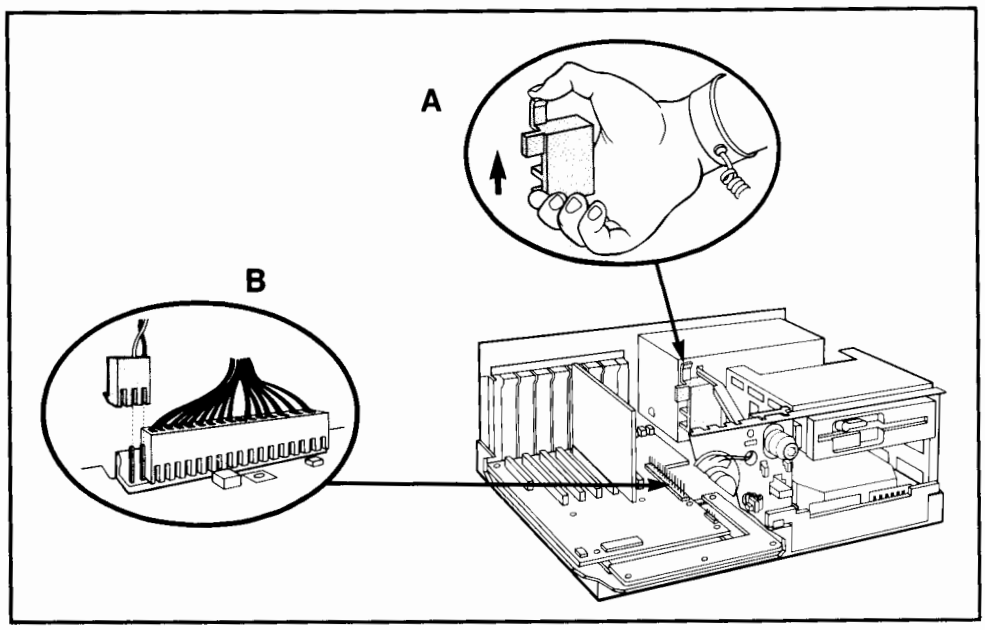
Changing the Battery Pack

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 45935-60201) available from your dealer or HP sales representative. Use of any other batteries risks explosion or fire.

To change the battery pack, follow the steps below.

1. **Turn off your computer and disconnect all cables and power cords.**
2. **Remove the cover and the power switch shaft.** (Refer to chapters 2 and 3).
3. **Press down on the plastic latch at the top of the battery holder (A), then lift up on the battery holder to detach it from the side of the power supply.** Refer to the figure opposite.
4. **Disconnect the battery wire from its connector (B).**



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. **Reattach the battery holder to the side of the power supply.**
8. **Reconnect the battery wires to the system board.**
9. **Replace the power switch shaft and the cover.**
10. **Connect all cables and power cords.** (Refer to chapters 2 and 3.)
11. **Run the SETUP program to set the time and date.** (Refer to chapter 8.)

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.*

Note

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

Configuration Error Message

The configuration of your computer, number and type of disk drives for example, is stored in the computer's CMOS memory. When the computer is restarted, the actual configuration found is compared with the information in the CMOS memory. If the two do not match, an error message is displayed:

```
Invalid configuration information - Run configuration utility
(SETUP)
Strike F1 to continue
```

Press F1 to continue operation and then insert and run the SETUP program to verify the configuration. The configuration will be erased if the battery runs down or is unplugged.

Power-On Selftest Error Messages

The following error messages indicate that a hardware failure has occured with your HP Vectra 286/12 PC. Contact your HP dealer for assistance.

Error Code	Error Message
0001	GC VRAM failed (Graphics Controller Video RAM)
0002	GC DRAM failed
0003	Host EPROM failed (BIOS)
0004	Local EPROM failed
0005	Graphics Controller failed
0006	Graphics Controller not found.
0010	Bad checksum on BIOS ROM 0.
0011	Bad checksum on BIOS ROM 1.
011X	RTC problem (Real Time Clock)
0120	RTC failed to tick.
0240	CMOS/RTC has lost power.
0241	Invalid checksum on CMOS.
2006	Memory Controller Failure
4XXX CXXX	Base Memory Error
62XX 63XX	Parity Error

X is any hex digit.

General Error Messages

This section lists error messages in alphabetical order and gives an explanation of what to do in each case (where necessary).

`Duplicate file name or file not found`

Explanation: You tried to rename a file to a file name that already exists, or the name you specified could not be found.

`File cannot be copied onto itself`

Explanation: The source file name you specified is the same as the target file.

`File creation error`

Explanation: You tried to add a new file name or replace a file that already exists in the directory, or there was not enough space for the file. If the file already exists, it is a read-only file and cannot be replaced. This error message may also occur if the root directory is full, or if the file name is the same as a volume, directory, or a hidden (or system) file.

`Format failure`

Explanation: MS-DOS could not format the disk. This message is usually displayed with an explanation as to why the command failed.

`Invalid configuration information - Run configuration utility (SETUP)`
`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 Vectra 286/12 Using the SETUP Program."

If the `Run SETUP` message appears when the power is switched on, the battery may be defective.

`Invalid path (or file not found)`

Explanation: You have entered a path or file name that does not exist. Enter a valid path or file name with the command. Refer to your MS-DOS manual for explanation of paths and filenames.

`Non-system disk or disk error`

Explanation: Replace the disk with the proper operating system 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 type `R` (for Retry), or check to see if the printer is on and ready to print.

`Syntax error`

Explanation: You have entered a command incorrectly. Check to make sure you have typed the command correctly and have used appropriate quotation marks.

`Unable to create directory`

Explanation: MS-DOS could not create the directory you specified. Check to see that there is no name conflict. You may have a file with the same name, or the disk may be full.

`Volume in drive` *x* `has no label`

Explanation: This is an informational message displayed in response to the DIR, LABEL, or VOL command.

HPEMM Error Messages

This section lists error messages that can occur when you are using HPEMM.

`Invalid parameter specified`

Explanation: One of the parameters specified on the command line in your CONFIG.SYS file is invalid.

`Expected equal after parameter`

Explanation: One of the parameters on the command line expected an equal (=) sign after the parameter, but none was found.

`Invalid number specified`

Explanation: A number was expected, but a non-number or a number containing invalid characters was found.

`Context depth must be between 1 and 32`

Explanation: An invalid number of contexts was specified. The number specified cannot be zero and must not be greater than 32.

`Invalid page frame address specified`

Explanation: The page frame address specified is not available for use as expanded memory. The memeory manager requires a 64 KB area above A000 which is not used by expansion ROM or RAM.

`Number of handles must be at least 3`
`Number of handles cannot exceed 255`

Explanation: The number must be between 3 and 255 to be valid.

`Number of contexts must be at least 3`
`Number of contexts cannot exceed 255`

Explanation: The number of contexts specified must be between 3 and 255.

`Invalid exclusion specified`

Explanation: An exclusion parameter was specified incorrectly.

`No expanded memory available`

Explanation: No expanded memory is available for use.

Invalid inclusion specified

Explanation: An inclusion parameter was specified incorrectly.

RAM parity error detected

Explanation: A parity error (hardware failure) was detected during the expanded memory tests.

RAM address error detected

Explanation: An address error was detected during the expanded memory tests.

No 64k page frame available

Explanation: The memory manager was unable to find a 64 KB window for the page frame. For the manager to operate, a 64 KB frame must exist above A000 hex.

Internal error in hardware interface

Explanation: A general hardware error was detected.

Invalid hardware for memory manager

Explanation: The GC113 chip set is defective or the wrong version.

No EMS memory allocated

Explanation: No memory is allocated for EMS use.

Amount of extended memory (EXT) specified too large

Explanation: The amount of memory specified for extended memroy exceeds the amount available in the system.

Refer to chapter 9 for more information on how to use the HPEMM program.

Cleaning Your HP Vectra 286/12

The most common problem experienced with electronic equipment of any kind is dust that builds up over a long period of time. Occasionally, you may want to wipe dust and fingerprints off the cover and display screen. Use the following suggestions to clean your computer. Any cleaning that cannot be done following these suggestions should be left to your dealer or HP service representative.

- Before cleaning the computer, make sure the power is off and the power cord is disconnected.
- Use a cloth that has been only slightly dampened with water or a non-detergent cleaning solution. Do not use spray liquids or a soaking-wet cloth.
- After cleaning the computer, make sure everything is dry before turning it back on.
- Do not attempt to clean diskettes.

Additional Help

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.

INTEREX, the International HP Users Group

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 a free prospective member packet, 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.

A

Computer Specifications

The Controller Board

Your computer comes with a controller board installed in slot 5. This board 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 hard disk drives (HDD)
- Connector for flexible disk drives (FDD)

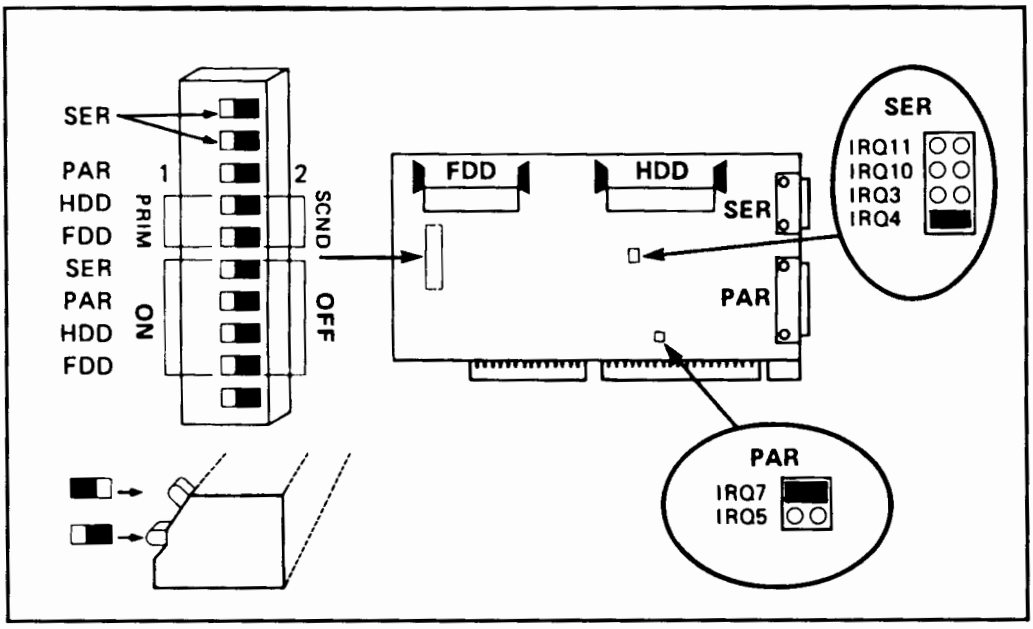
There are two different types of controller available, depending on the hard disk drive that came installed in the computer.

1. The AT multifunction controller is used with hard disk drives containing an embedded-AT controller (42 MB and above). The AT multifunction controller is a "half-length" board.
2. The ST-506 controller is used with a low capacity ST-506 hard disk drive (20 MB or less). The ST-506 controller is a "full-length" board with a notch along the top edge.

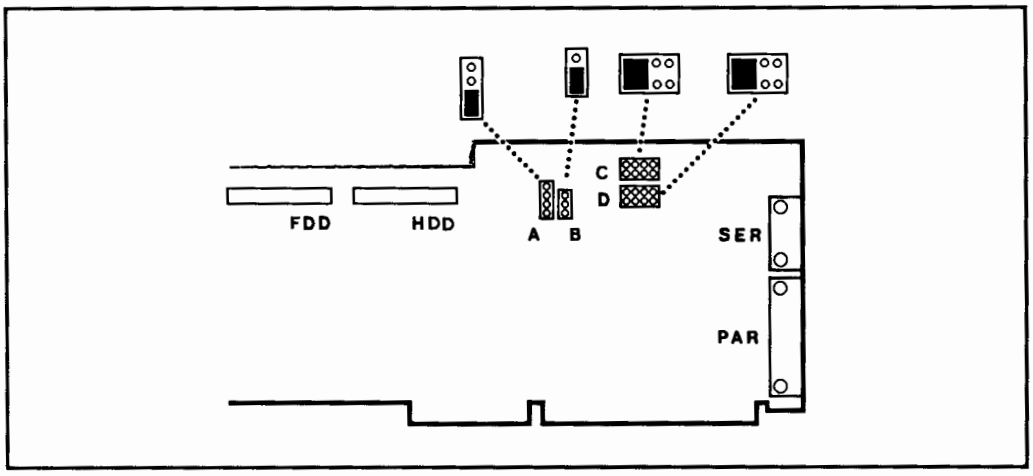
The "Factory-Installed Items" section in chapter 1 explains how to identify the controller board delivered with your computer.

The controller is set to these defaults (factory settings):

Flexible disk controller—set to primary address
Hard disk controller—set to primary address
Parallel port—set to parallel port 1 (LPT1)
Serial port—set to serial port 1 (COM1)



Switches and Jumpers on AT Multifunction Controller Board

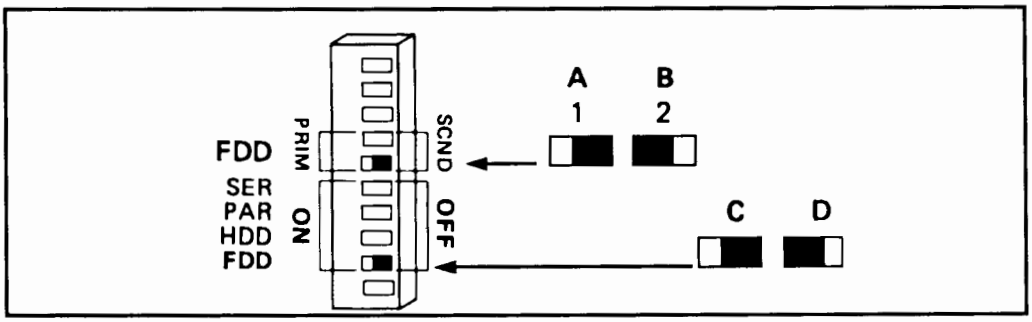


Jumpers on ST-506 Controller Board

AT Multifunction Controller Board

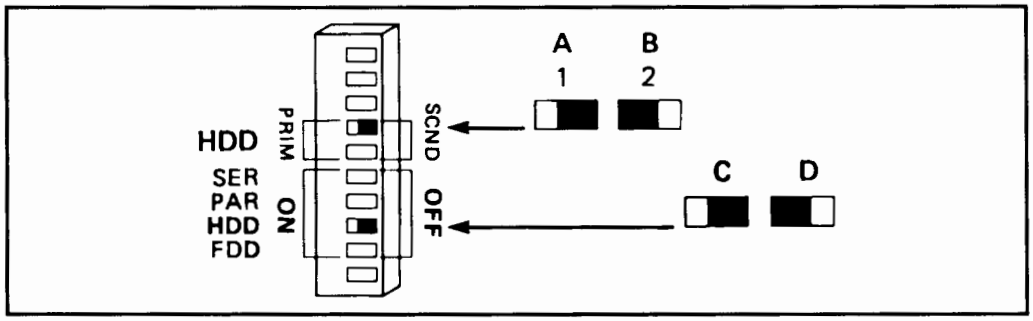
AT Multifunction Controller Flexible Disk (FDD) Settings

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



AT Multifunction Board Hard Disk Controller (HDD)

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



AT Multifunction Controller Serial Port (SER) Settings

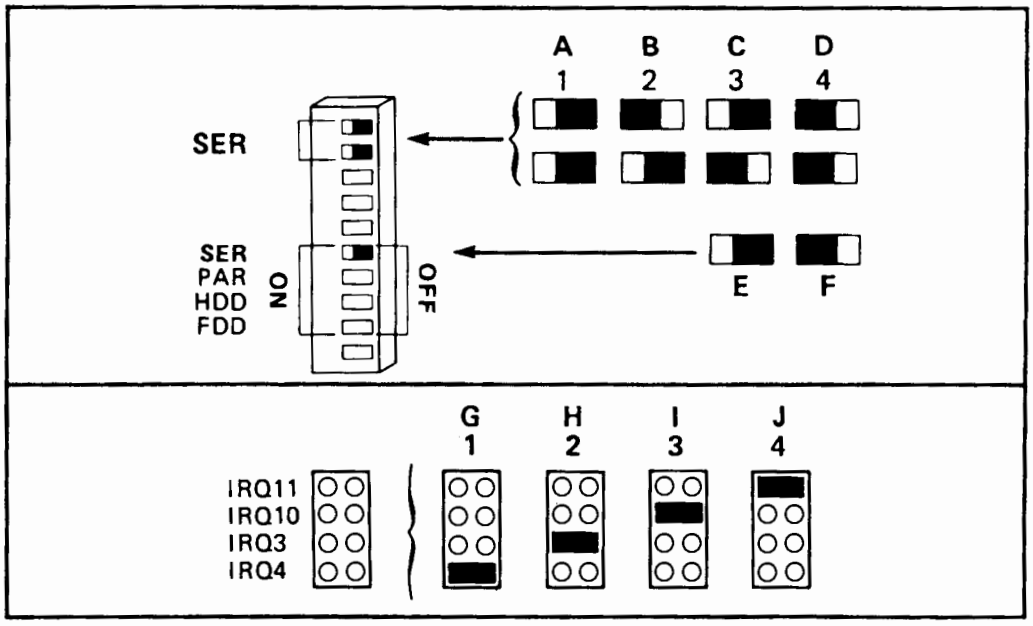
When the serial port is enabled (setting E) it can be configured using the switches as either:

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

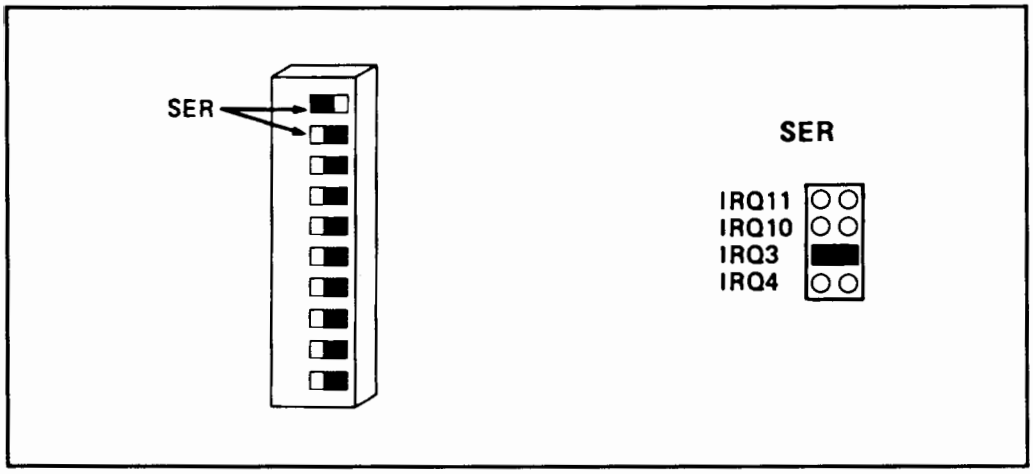
Or it can be disabled (F).

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

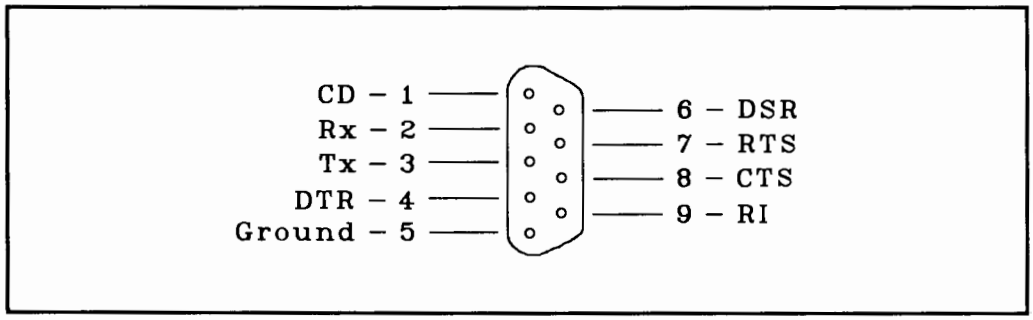
If you use:	**Select:**
COM1	IRQ4 (setting G, default)
COM2	IRQ3 (H)
COM3	IRQ10 (I)
COM4	IRQ11 (J)



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 Controller Parallel Port (PAR) Settings

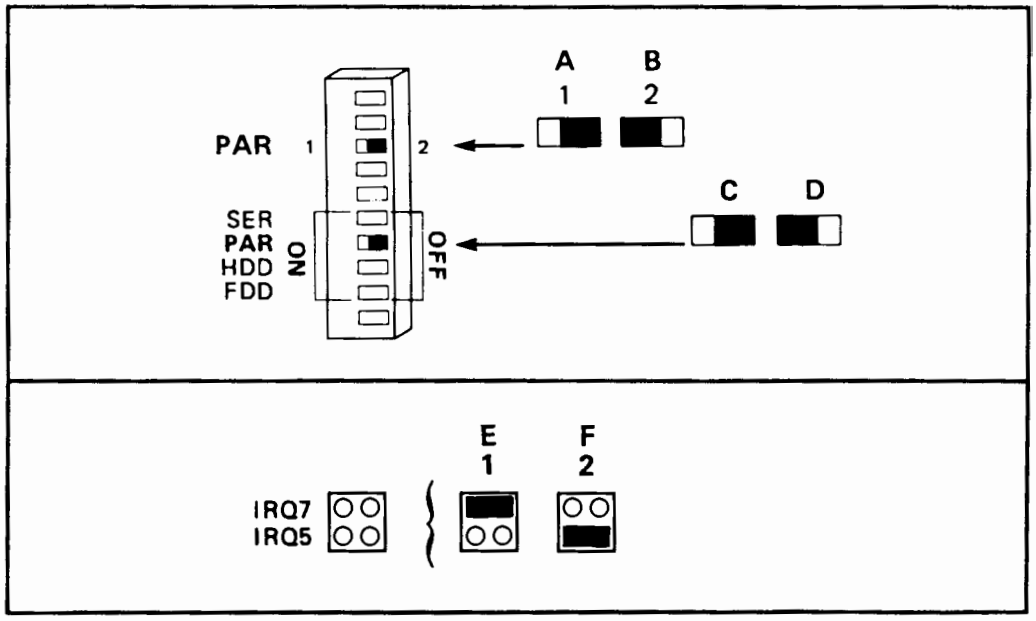
When the parallel port is enabled (setting C) it can be configured using the switches as either:

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

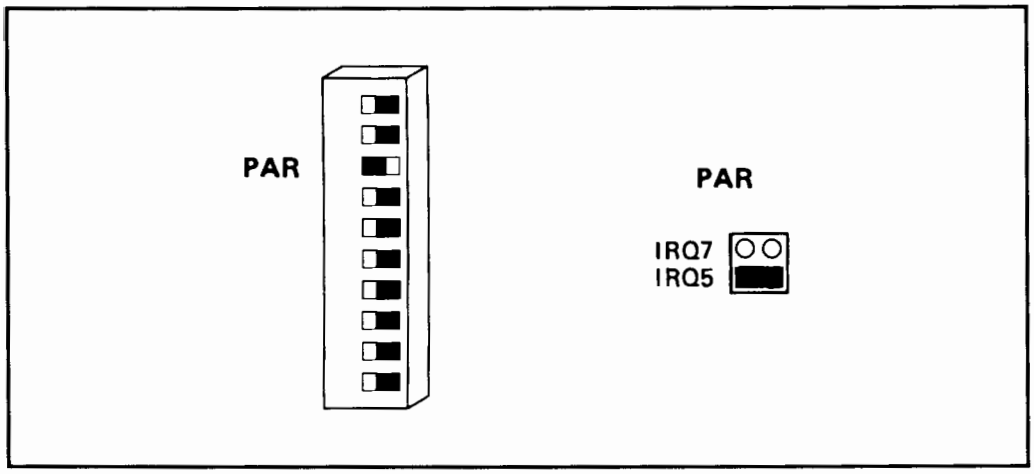
Or it can be disabled (D).

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

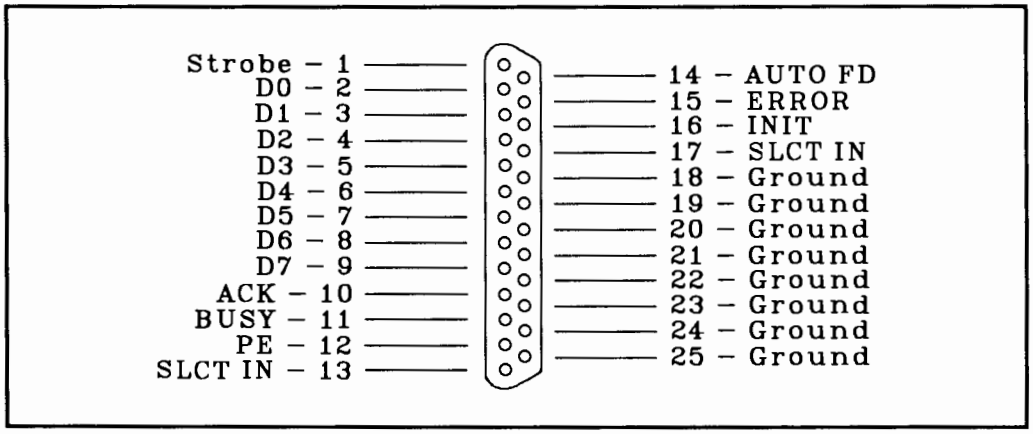
If you use:	**Select:**
LPT1	IRQ7 (setting E, default)
LPT2	IRQ5 (setting F)



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.



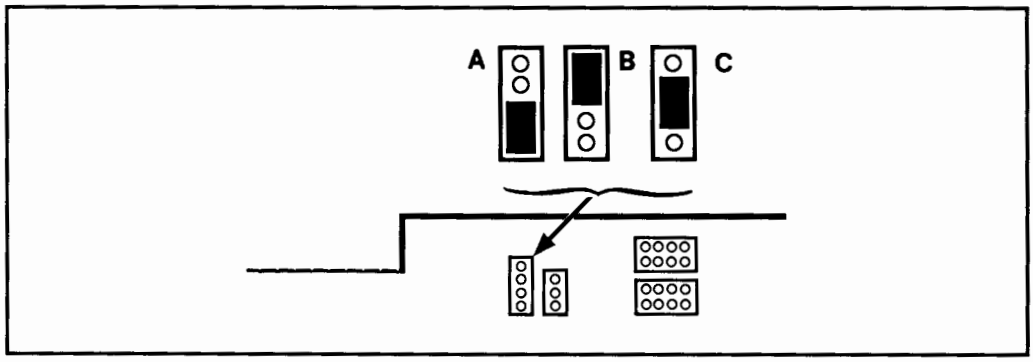
Parallel Connector Pinouts



ST-506 Controller Board

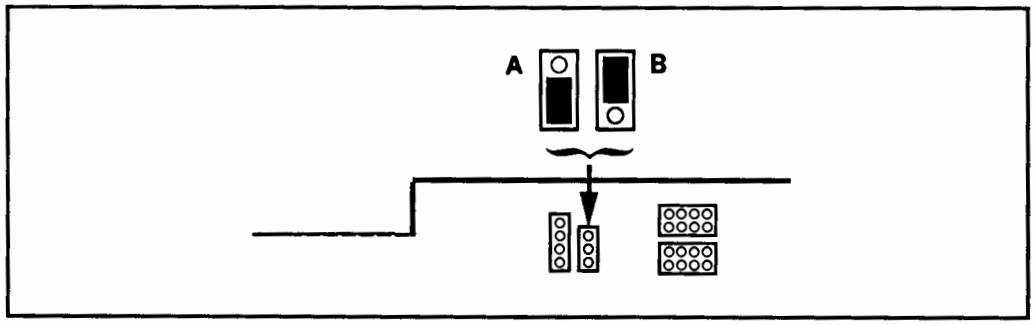
ST-506 Controller Flexible Disk (FDD) Settings

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



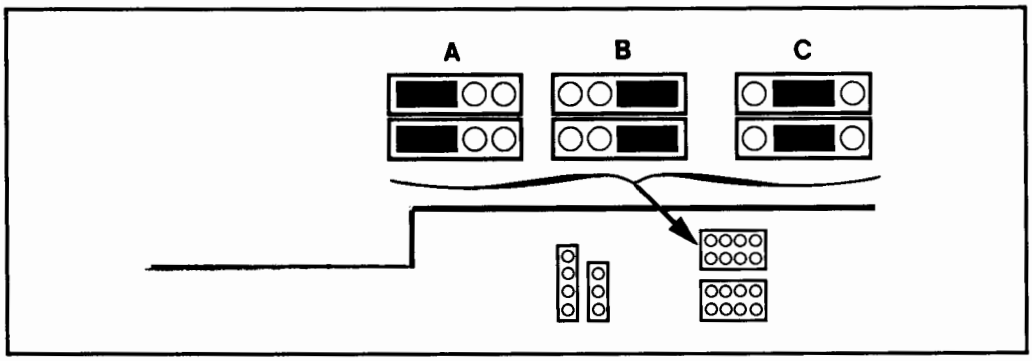
ST-506 Controller Hard Disk (HDD) Settings

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

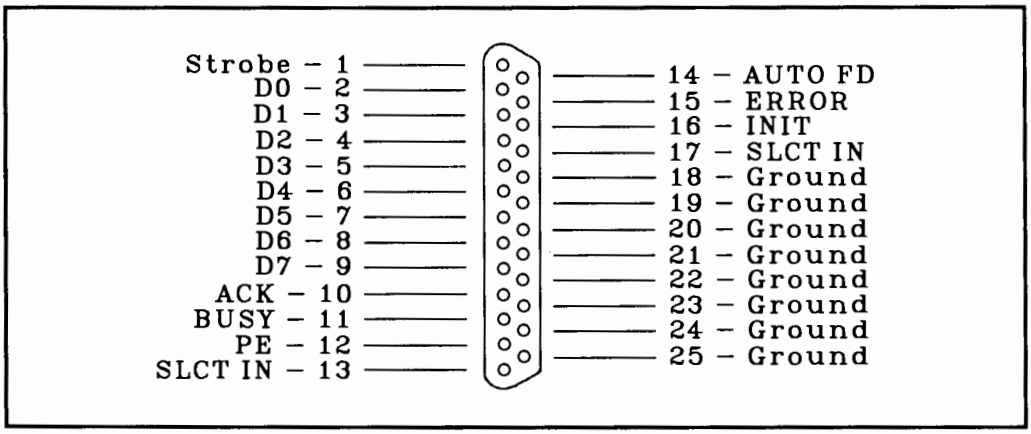


ST-506 Controller Parallel Port (PAR) Settings

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

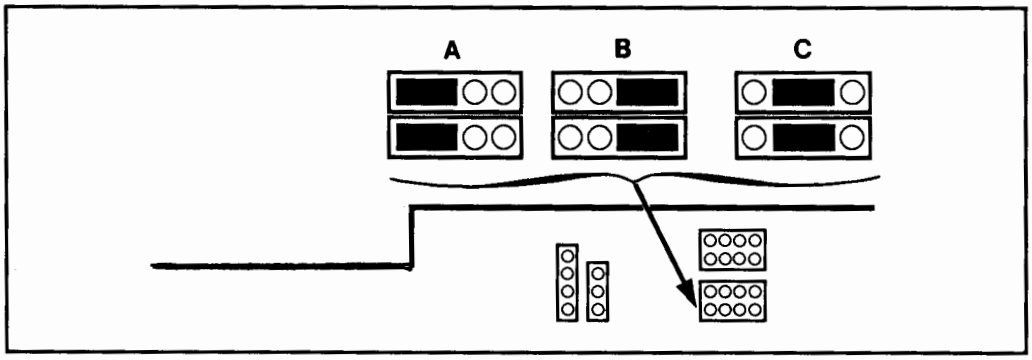


Parallel Connector Pinouts

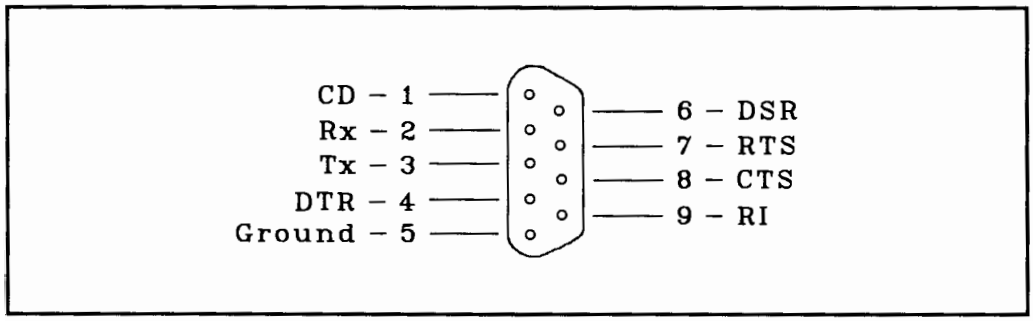


ST-506 Controller Serial Port (SER) Settings

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



Serial Connector Pinouts

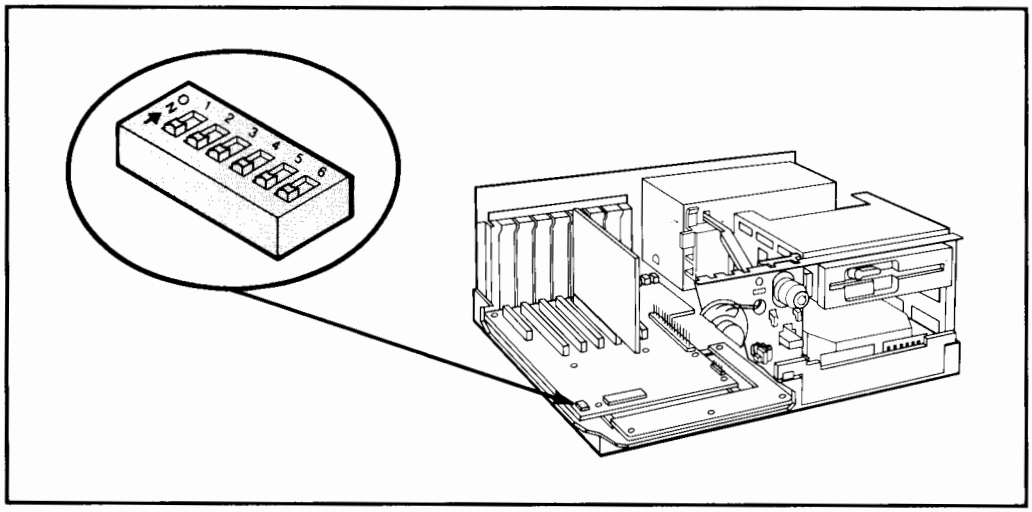


The System Board Switches

There are six switches on the system board as listed below.

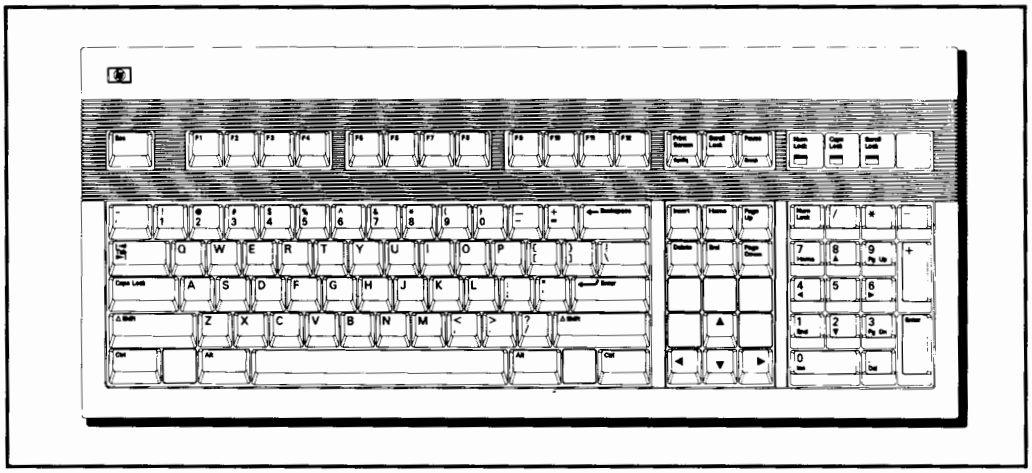
Switch	Description	Available Settings	Default
1*	Video interrupt IRQ 9	ON = disable OFF = enable	OFF (enable)
2*	Built-in VGA	ON = disable OFF = enable	OFF (enable)
3	Mouse Enable	OFF = enable ON = disable	OFF (enable)
4	Power-on password (see chapter 10)	ON = disable OFF = enable	OFF (enable)
5	Option ROMs (Memory Extension Board)	ON = disable OFF = enable	OFF (enable)
6	Not used	Do NOT change	OFF

1. Some older CGA software uses IRQ 9 for synchronization; you may need to change switch 1 to ON. Refer to your video software manual for information.
2. If you install a video board you must disable the built-in video by setting switch 2 to ON.

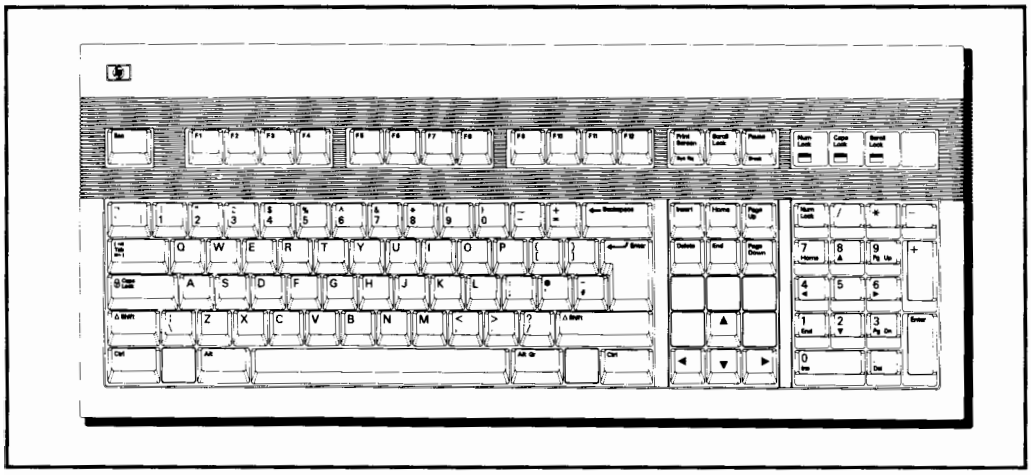


The Available Keyboards

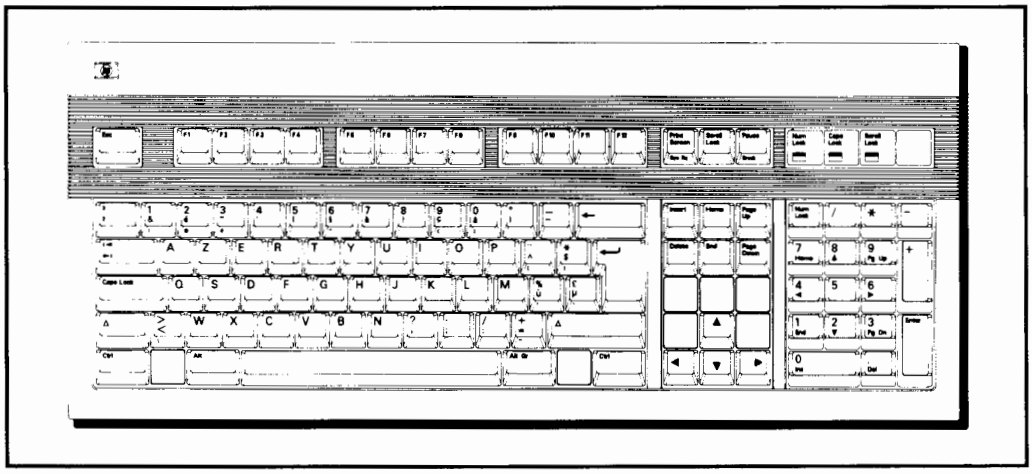
If you have re-mapped your keyboard using MS-DOS commands, refer to the following illustrations for the keyboard layouts.



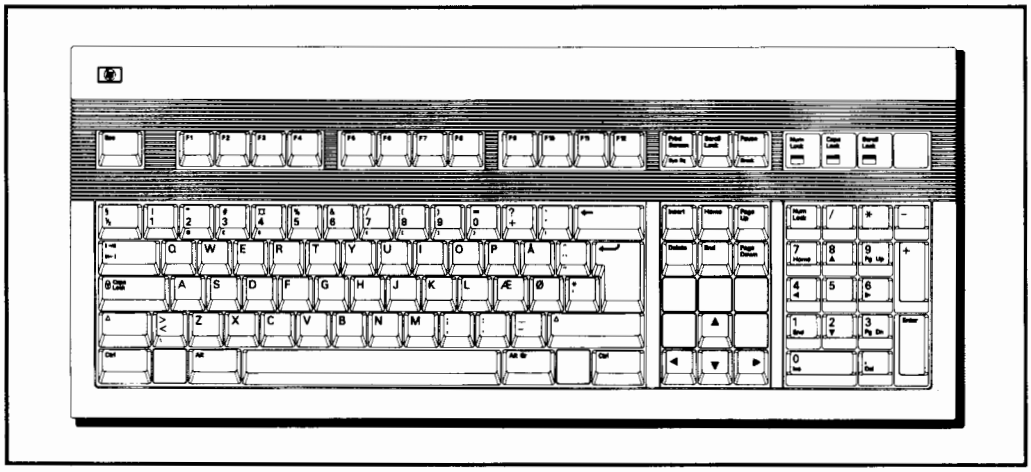
U.S.



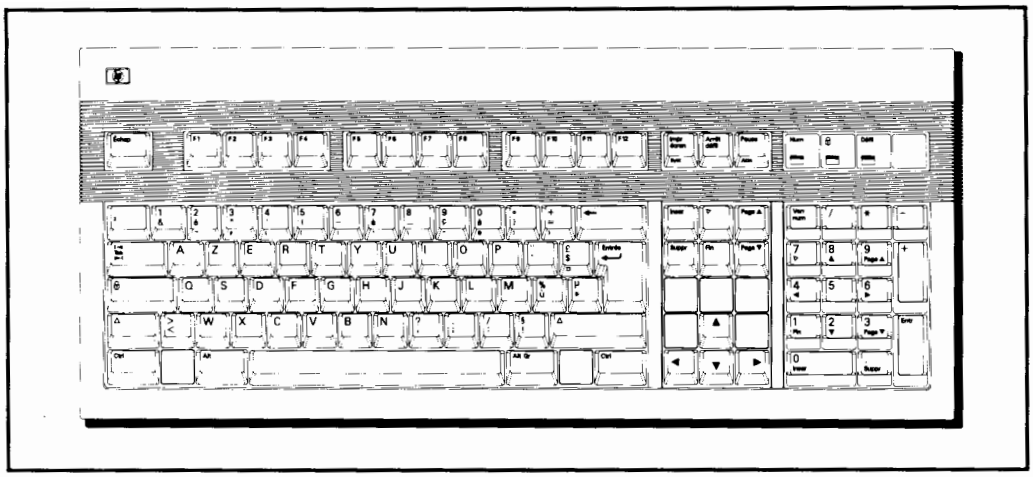
U.K./English



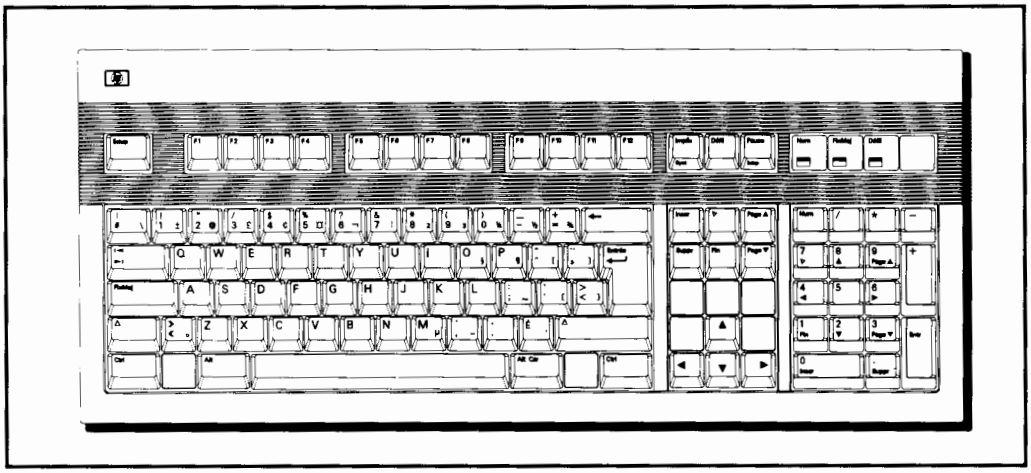
Belgian



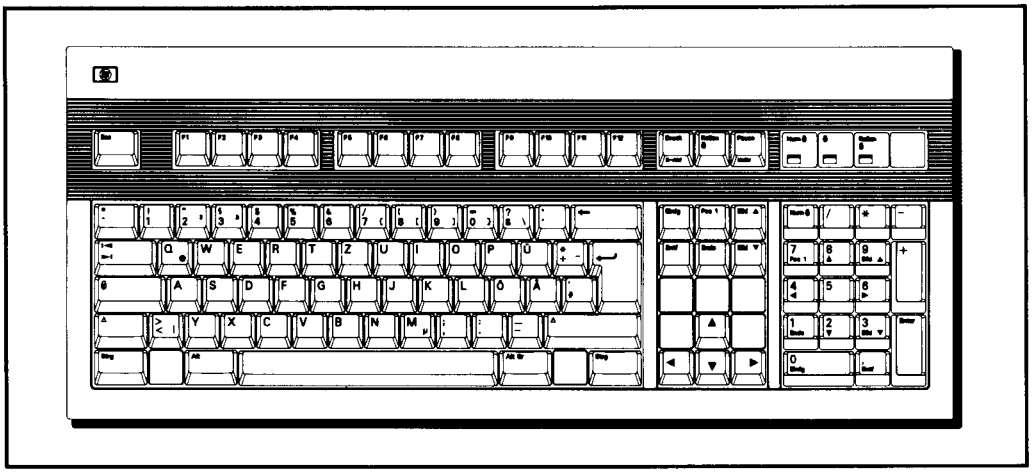
Danish



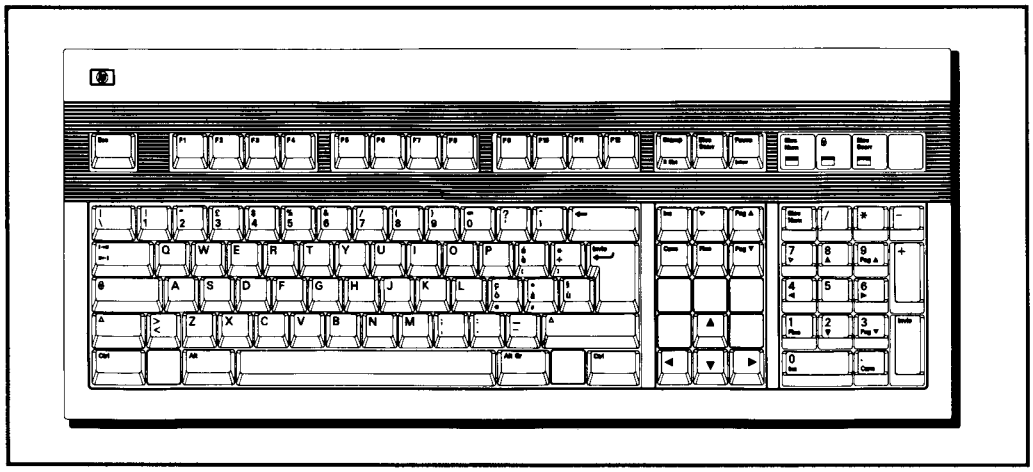
French



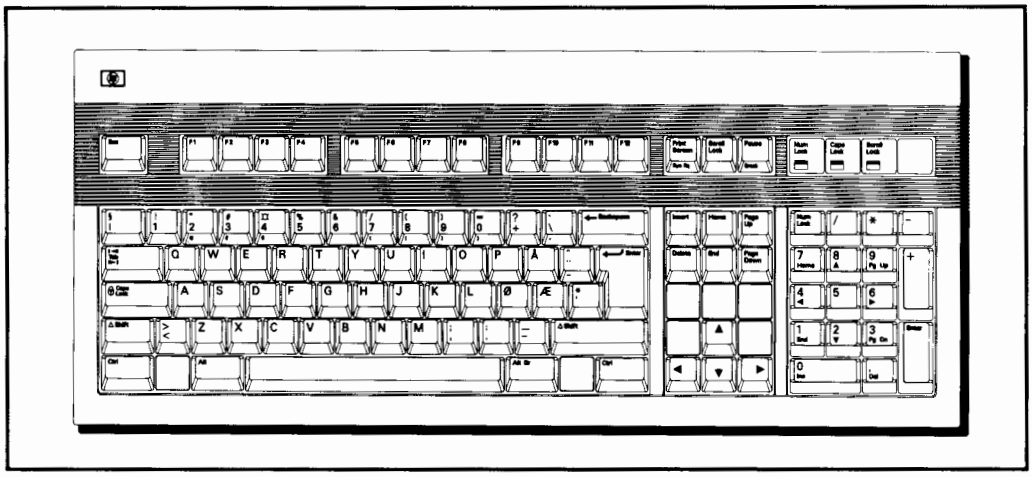
French Canadian



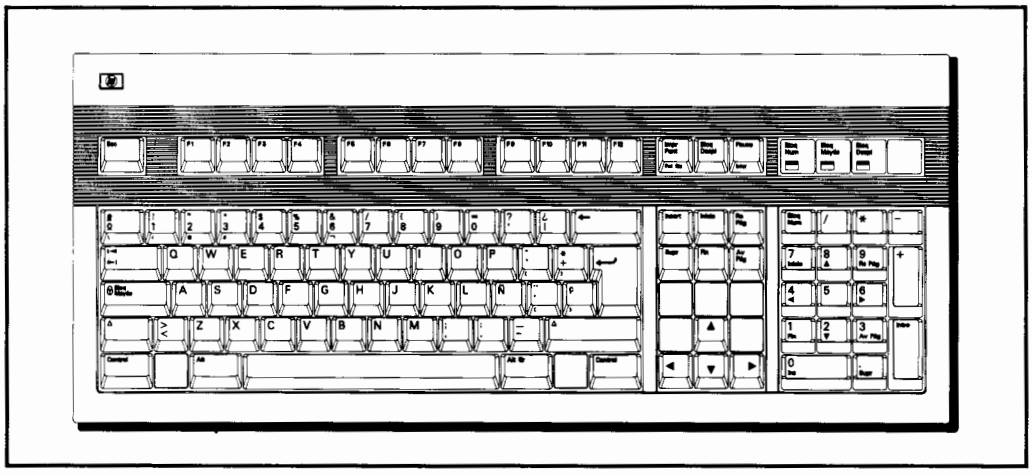
German



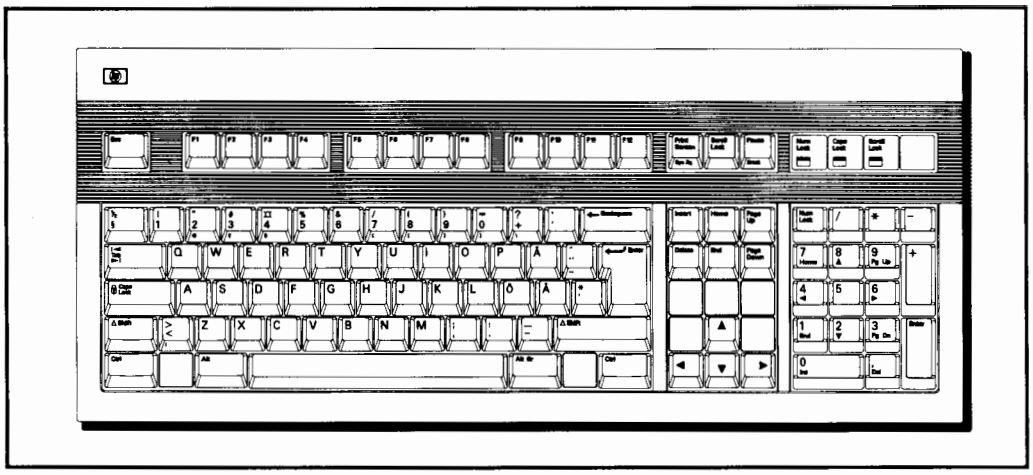
Italian



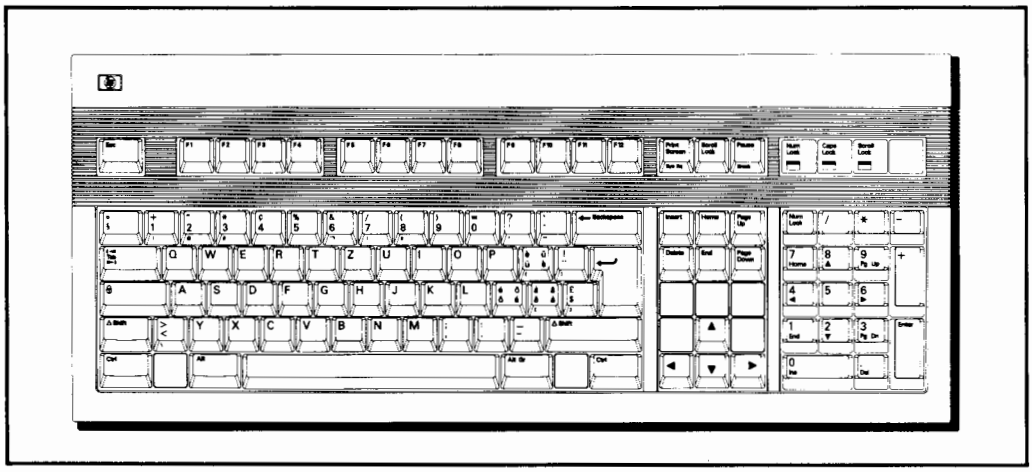
Norwegian



Spanish



Swedish



Swiss French/Swiss German

B

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Limited Warranty

Software

HP warrants for a period of **NINETY (90) DAYS** from the date of purchase that the software product will execute its programming instructions when properly installed on the personal computer or workstation indicated on this package. HP does not warrant that the operation of the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, Customer's remedy shall be to return the diskette(s) or tape cartridge(s) ("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.

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.

Notice of Warranty Claims

Customer must notify HP in writing of any warranty claim not later than thirty (30) days after the expiration of the warranty period.

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Exclusive Remedies

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

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**UK only: if you are a "consumer" as defined by statutes, parts of this statement may not apply to you.*

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C

Regulatory Information

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 Vectra personal 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 Vectra personal 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 Vectra personal 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 THESE PORTS" 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.

The HP Vectra 286/12 is approved under approval number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems in the UK.

Notice for Japan

この装置は，第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）基準に適合しております。

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。

Glossary

BIOS
Basic Input/Output System. Code within the computer that controls the input and output of data.

board
A printed circuit assembly (PCA). Also called a card or adapter.

bus
An electrical connection over which information is transported.

Bus-Master
A board that contains its own microprocessor and can take temporary control of the system from the 80286 microprocessor during DMA accesses.

CMOS memory
A separate portion of your computer's memory whose contents are preserved when you turn off the computer. CMOS memory stores information that must be maintained, such as your computer's configuration. Also called nonvolatile memory, nonvolatile RAM (NVRAM), or battery backed-up CMOS.

expanded memory manager
A utility that creates expanded memory (which is usable by MS-DOS) from portions of base, reserved, and extended memory. Expanded memory managers, such as HPEMM, will increase the performance of your computer.

HP Utilities
These are utilities for use with MS-DOS. The HP Utilities are: EXMODE, a utility that lets you manipulate processor speed, HPEMM, an expanded memory manager, and the HP Super VGA drivers.

ISA
Industry Standard Architecture. An architecture once used by all IBM-compatible personal computers.

Lotus-Intel-Microsoft Expanded Memory Specification (LIM EMS)
A software standard to which many programs comply. MS-DOS programs that comply with version 4.0 of this specification can use memory above 640 KB with the help of HPEMM.

memory modules
Miniature boards containing memory chips. You add memory modules to your existing memory board to increase the amount of available memory, up to 8 MB.

network server mode
A security measure that prevents unauthorized use of an input device (like a keyboard or mouse) while your computer is running as an unattended network server.

nonvolatile memory
A separate portion of your computer's memory whose contents are preserved when you turn off the computer. Nonvolatile memory stores information that must be maintained, such as your computer's configuration. Also called CMOS memory, nonvolatile RAM (NVRAM), or battery backed-up CMOS.

option
An accessory (other than a board) used with your computer. For example, a flexible disk drive and a mouse are both options.

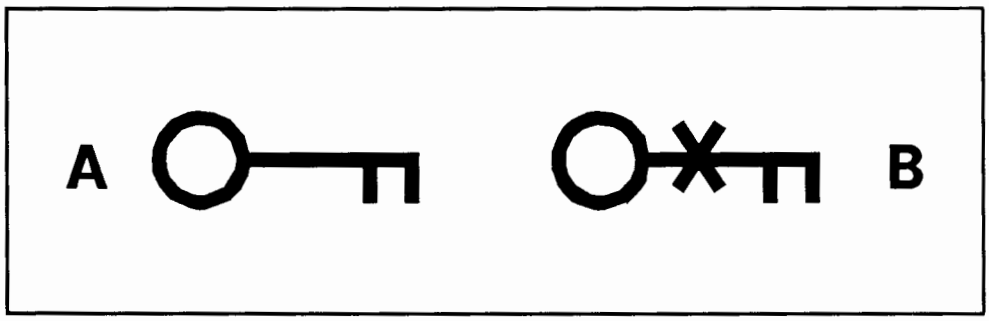
pages
Blocks of memory (16 KB each) created in expanded memory. MS-DOS applications written to the Lotus-Intel-Microsoft Expanded Memory Specification version 4.0 (LIM EMS 4.0) can store programs and data in these pages.

page frame
An unused block of addresses under 1 MB to which your expanded memory manager remaps pages of information stored in expanded memory. This

remapping is done because MS-DOS applications can only use information that has a logical address under 1 MB.

power-on password

A security measure that you can use to prevent unauthorized use of your computer. Once you set the password using the SETUP program, every time you start your computer, you will be prompted to enter the password by a key icon (A). If you enter the password incorrectly, the bad-password icon (B) will be displayed. You have three chances to enter your password correctly.



Power-On Self Test (POST)

A series of tests your computer performs when you turn on the power. If any of the Power-On Self Tests fail, a "beep" will sound and an error code will appear on your screen as a number. (Fatal errors will not be displayed on your screen.)

primary disk

The hard disk drive from which you start your computer—it contains your operating system files. The primary disk is usually the highest capacity hard disk drive in your computer and it is located in the bottommost drive shelf.

system board

The main circuit board onto which all other boards, such as the memory board and video board, are plugged. Also called the "mother board."

Index

HEWLETT PACKARD

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