VPC II User's Guide

Home of the ACT Sirius 1
and
Victor Computers

Rev. A

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Important Software Diskette Information

For your own protection, do not use this product until you have made a backup copy of your software diskette(s). The backup procedure is described in the user's guide for your computer.

Please read the DISKID file on your new software diskette. DISKID contains important information including:

- The part number of the diskette assembly.
- The software library disk number (for internal use only).
- The date of the DISKID file.
- A list of files on the diskette, with version number, date, and description for each one.
- Configuration information (when applicable).
- Notes giving special instructions for using the product.
- Information not contained in the current manual, including updates, any known bugs, additions, and deletions.

To read the DISKID file onscreen, follow these steps:

1. Load the operating system.
2. Remove your system diskette and insert your new software diskette.
3. Enter

   type diskid↵

4. The contents of the DISKID file is displayed on the screen. If the file is large (more than 24 lines), the screen display will scroll. Type Ctrl-S to freeze the screen display; type Ctrl-S again to continue scrolling.

THIS INFORMATION IS FURNISHED TO COMPLY WITH FCC REQUIREMENTS.

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a CLASS A computing device pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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Appendixes

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Preface

The VICTOR VPC II is an extended-technology microcomputer with an 8086 central processor and 256 to 640 kilobytes of random-access memory (RAM).

The VPC II is available in the following configurations:

- Diskless workstation: No disk drives, 256 kilobytes of RAM
- Single-floppy disk system: One 360-kilobyte floppy disk drive, 640 kilobytes of RAM
- Dual-floppy disk system: Two 360-kilobyte floppy disk drives, 640 kilobytes of RAM
- Fixed disk system: One 360-kilobyte floppy disk drive, one 20-megabyte fixed disk, 640 kilobytes of RAM

The descriptions and explanations in this guide assume that your system includes at least one floppy disk drive. If you are using a diskless workstation, consult your network documentation.

Software supplied with the VPC II includes the operating system, MS-DOS 3.1; VBASICA, an enhanced version of the GW-BASIC programming language; and a number of diagnostic programs.

In addition to this user's guide, two manuals are supplied with the VPC II: the *MS-DOS 3.1 Reference* and *VBASICA*. The *MS-DOS 3.1 Reference* gives detailed explanations of all aspects of the operating system and its utility programs. *VBASICA* explains VBASICA programming techniques and describes each command of the VBASICA language.

The *VPC II User's Guide* describes the hardware components and basic operating procedures of the VPC II and introduces you to the fundamental aspects of MS-DOS. After you have read this guide, you should be able to operate the VPC II successfully. The *VPC II User's Guide* also includes appendixes to help you with installation of optional devices and to assist you with any problems you encounter.

The *VPC II User's Guide* contains the following five chapters and seven appendixes:

Chapter 1, "Getting Started," describes the components of the VPC II, the setup of your system, and fundamental operations such as copying your system diskette and loading MS-DOS into RAM.

Chapter 2, "More About Diskettes," describes types of diskettes and the proper handling, formatting, and copying of diskettes. Chapter 2 also describes how to protect the data you store on diskettes.

Chapter 3, "The Fixed Disk," explains fixed disk setup and operations, and provides useful suggestions for getting the most satisfaction from your fixed disk.

Chapter 4, "The Keyboard," describes the arrangement and the functions of the keys on the VPC II keyboard, and explains how to adjust the height of the keyboard.

Chapter 5, "Overview of MS-DOS," introduces you to the fundamentals of the MS-DOS operating system supplied with your VPC II. This chapter explains file types and file-naming rules and conventions, and describes several MS-DOS commands that you are likely to use frequently. Chapter 5 also tells you how to install and use a virtual disk.

Appendix A, "Internal Option Installation," describes the general procedures for installing internal options, including an 8087 math coprocessor and adapter cards.

Appendix B, "External Option Installation," explains the general procedures for installing external options such as parallel and serial printers.

Appendix C, "Main Circuit Board Switch Settings," describes the functions of the dip switches on the VPC II main circuit board.

Appendix D, "International Keyboards," describes how to load international keyboard software and shows the keyboard layouts for the five keyboards available with the VPC II.

Appendix E, "Troubleshooting," lists some procedures to try before calling for service if you encounter apparent hardware problems with your VPC II.

Appendix F, "Initial Power-On Diagnostics Error Codes," lists and briefly explains the error codes that can be generated by the system's internal self-diagnostic checks.

Appendix G, "Running the Diagnostic Programs," explains how to copy your diagnostics diskette and how to run the diagnostic programs supplied on it.

1

Getting Started

This chapter introduces you to the components of your VPC II and explains how to set them up. Then the chapter explains the operations you must perform before you can use your VPC II and describes how to move and clean the system.

1.1 Components of the VICTOR VPC II

Your VPC II system includes the following components:

- **System unit**

  The system unit contains the central processing unit (CPU), system memory and other electronics, internal options installed by your dealer, the floppy disk drive(s), and the fixed disk (if your system has one).

- **Keyboard and keyboard cable**

  The keyboard is one of the five available keyboards illustrated in Appendix D: American, United Kingdom, French, German, or Swedish. The keyboard cord is permanently attached to the keyboard.

- **Power cord**

  The power cord plugs into the back of the system unit, but is not permanently attached to the system unit.

- **Master diskettes**

  Three master diskettes are provided. Two diskettes contain the MS-DOS 3.1 operating system and its utilities and the VBASICA programming language. The third diskette contains the diagnostic utility programs described in Appendix G.

▶ Documentation

Three manuals are provided with the VPC II:

VPC II User's Guide
MS-DOS 3.1 Reference
VBASICA

1

Figure 1-1 shows the system unit of a fixed disk system from the front and side, and Figure 1-2 shows the back of the system unit.

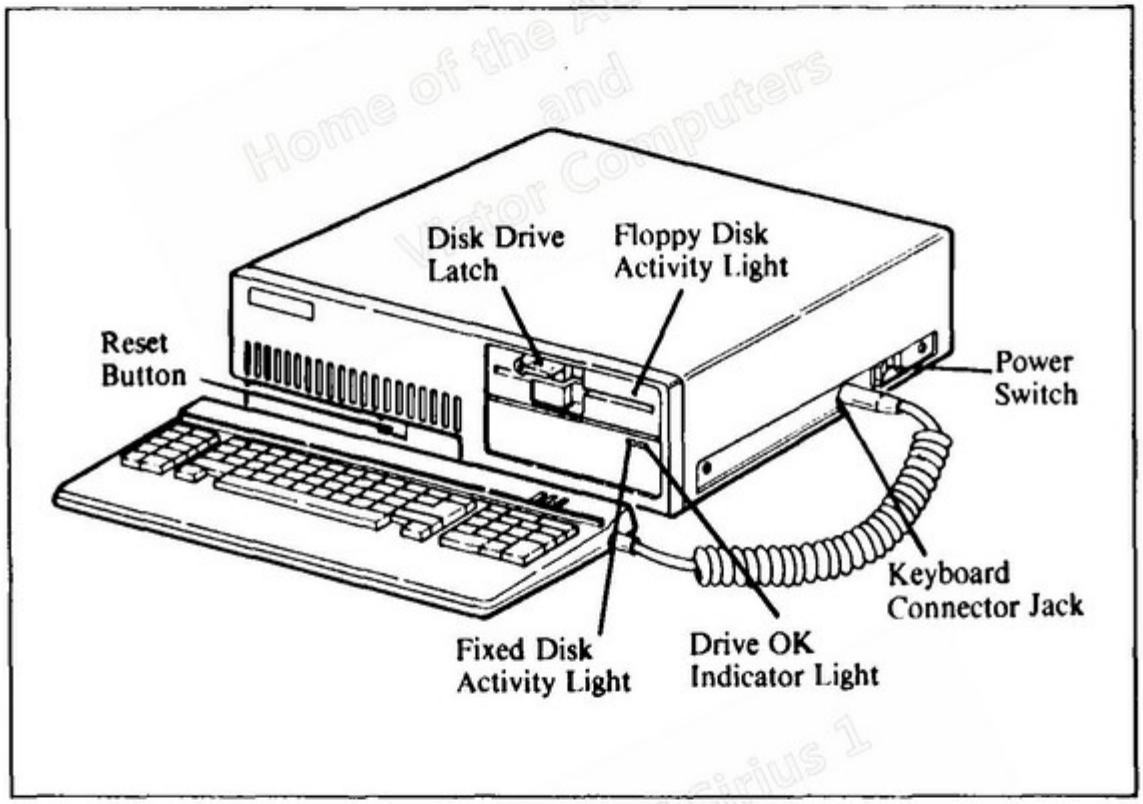

Figure 1-1: Fixed Disk System Unit, Front and Right Side

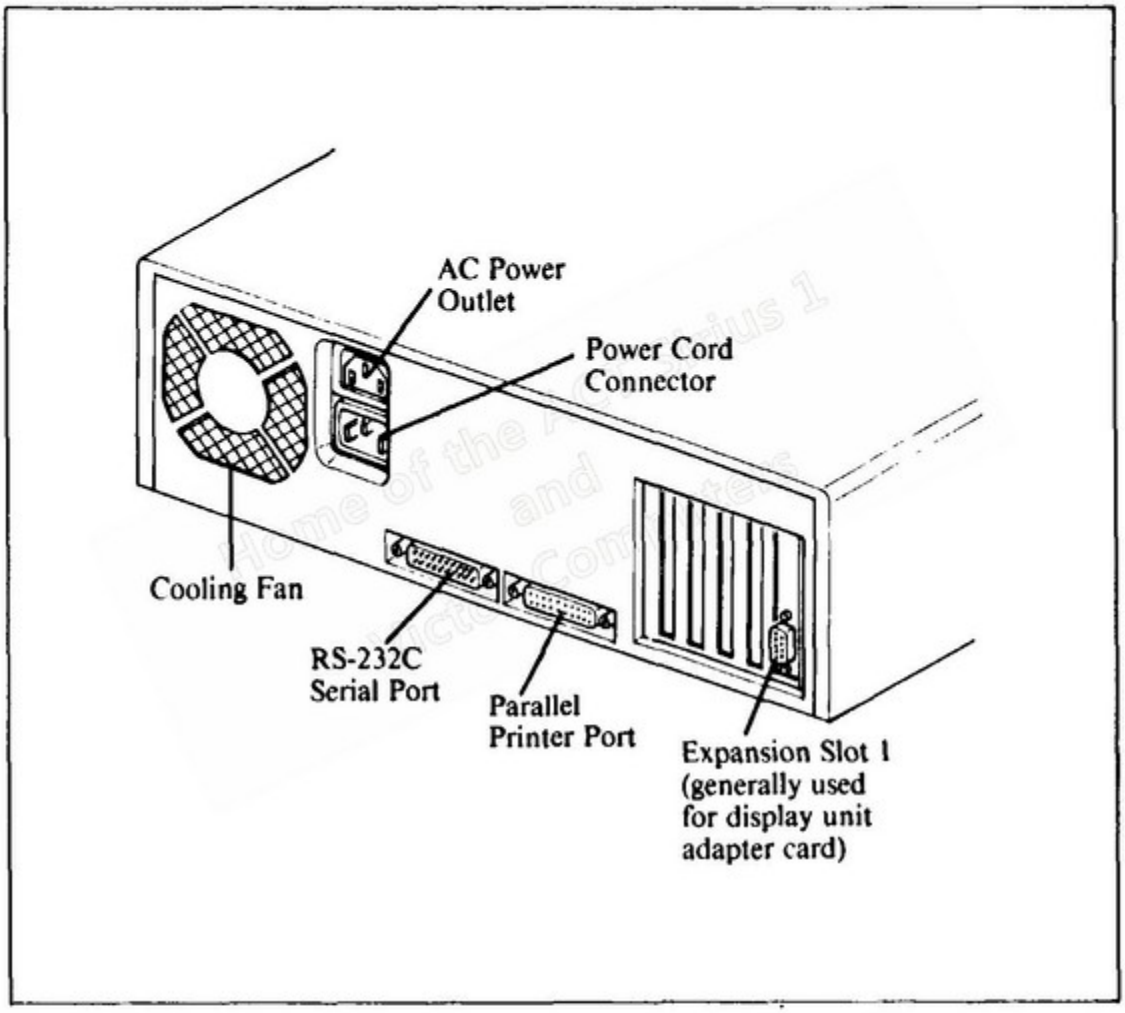

Figure 1-2: System Unit, Back

1.2 Setting Up Your System Components

This section gives suggestions for the safe operation of your VPC II and describes how to set up the components of the system.

1

1.2.1 Environmental and Safety Considerations

Set up and operate your VPC II according to the following environmental considerations:

- Set your system up in a location where it will not be exposed to direct sunlight, dust, or heavy vibration or impact.
- Keep the temperature between 50–110 degrees Fahrenheit (10–40 degrees Celsius).
- Keep relative humidity below 90% so that no condensation occurs.
- Connect the system unit power cord to a three-prong, grounded 110-volt AC outlet (or 240-volt, for 240-volt systems).

Observe these precautions when operating your VPC II:

- Do not operate the system with the system unit cover removed.
- Always plug the system unit and external devices into grounded outlets.
- Never plug in or unplug the system unit or other devices when your hands are wet.
- When you unplug a power cord, hold on to the plug; do not pull on the cord itself.
- If liquid is spilled on a component of your system, turn off and unplug all the components immediately.
- Do not place the fixed disk system on the same table or desk with an impact printer. The printer's vibrations might damage the fixed disk.

Carefully unpack your system components. Save all packing materials to use whenever you move your VPC II to another location. Once you

have placed the system unit in a suitable location, connect the components as described in the following sections.

1.2.2 Connecting the Keyboard to the System Unit

Plug the keyboard connector into the keyboard connector jack on the right side of the system unit, as shown in Figure 1-3.

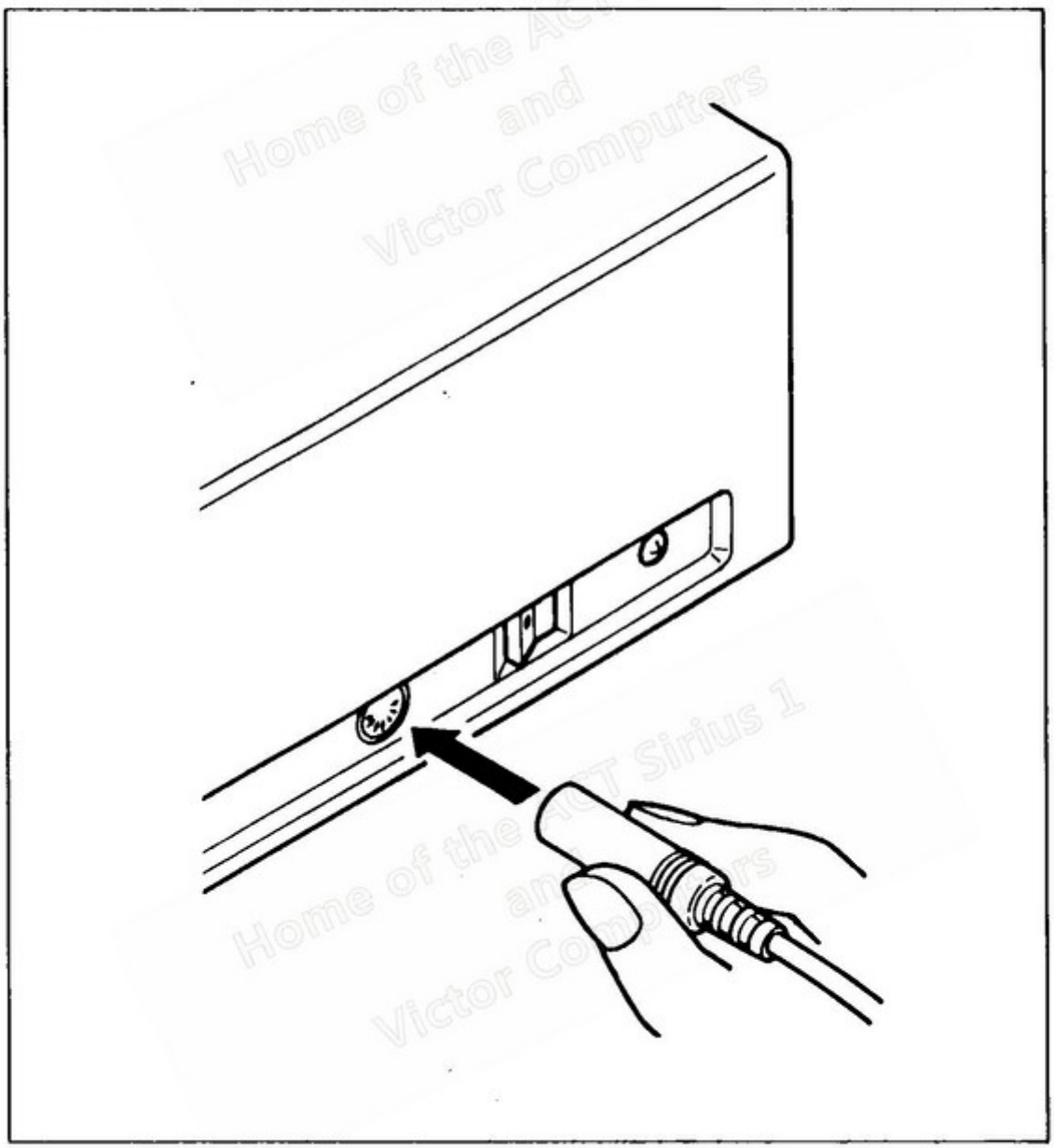

Figure 1-3: Connecting the Keyboard

If you purchased your VPC II, a display unit, and a display unit adapter card from the same dealer, the dealer may have installed the adapter card for you. If so, connect your display unit to the system unit as described in this section.

If your system unit does not contain a display unit adapter card, proceed to Appendix A, "Internal Option Installation," for directions on installing the adapter card.

The display unit you attach to your VPC II system is one of three types:

- Red-Green-Blue (RGB) color
- Composite color (such as a color television)
- Monochrome

Each kind of display unit requires a matching display unit adapter card. The connectors on the cards differ, but for each type you must connect a cable from the display unit to a socket on the adapter card. The socket protrudes from the back of the system unit.

Figures 1-4 and 1-5 show cables from the three types of display units being connected to display unit adapter cards at the back of the system unit. These figures all show the adapter card installed in expansion slot 1. The card is usually installed in slot 1, but you can install it in a different expansion slot if you want.

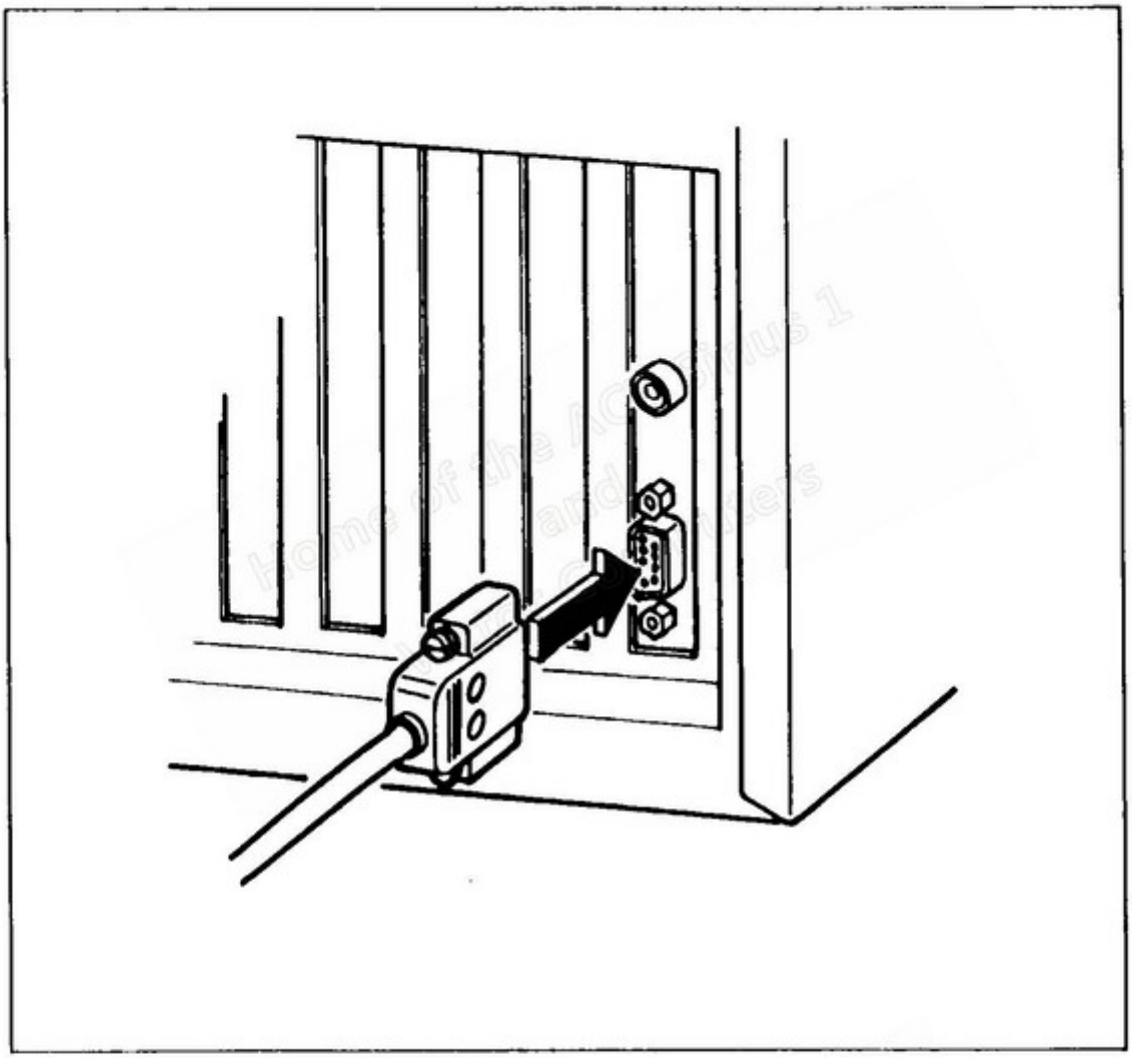

Figure 1-4: Connecting a Monochrome or RGB Color Display Unit

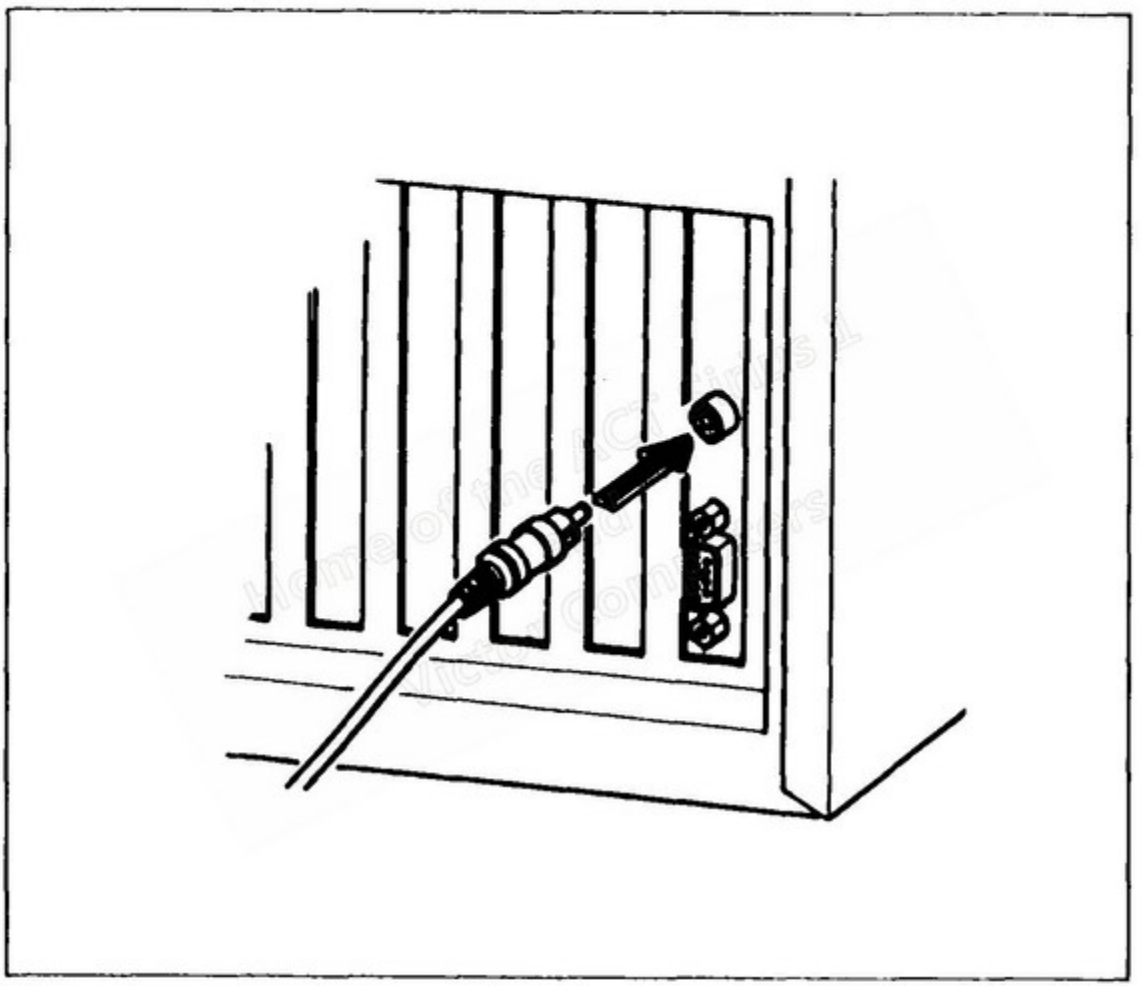

Figure 1-5: Connecting a Composite Color Display Unit

Some display units are equipped with a special plug and can be plugged directly into the AC outlet on the back of the system unit, as shown in Figure 1-6.

Other display units plug into a three-prong grounded wall outlet. Check the plug type of your display unit before plugging it in.

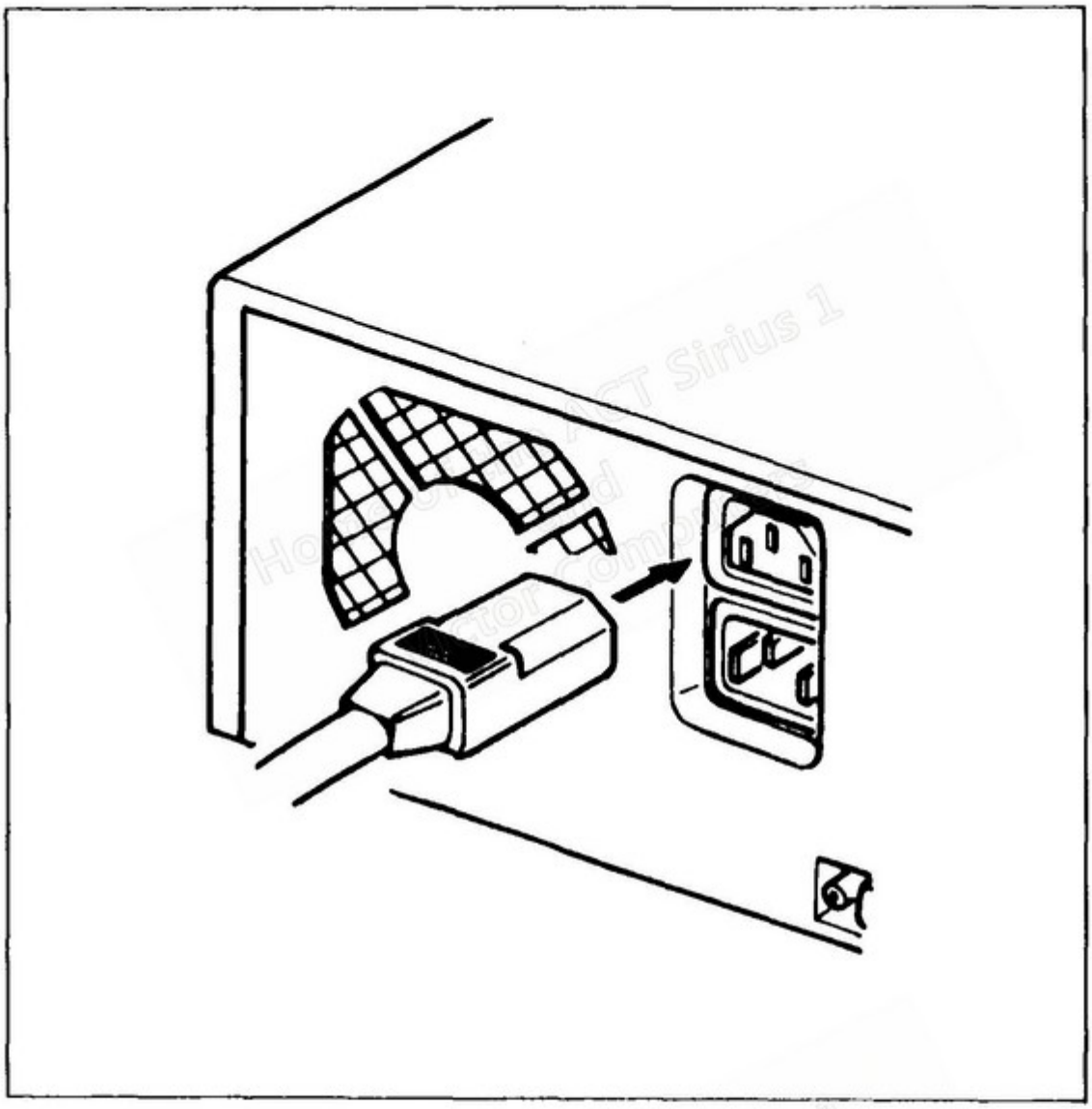

Figure 1-6: Plugging a Display Unit Power Cord into the System Unit

1.2.4 Connecting the Power Cord to the System Unit

Attach the female end of the power cord to the power cord connector on the back of the system unit, as shown in Figure 1-7.

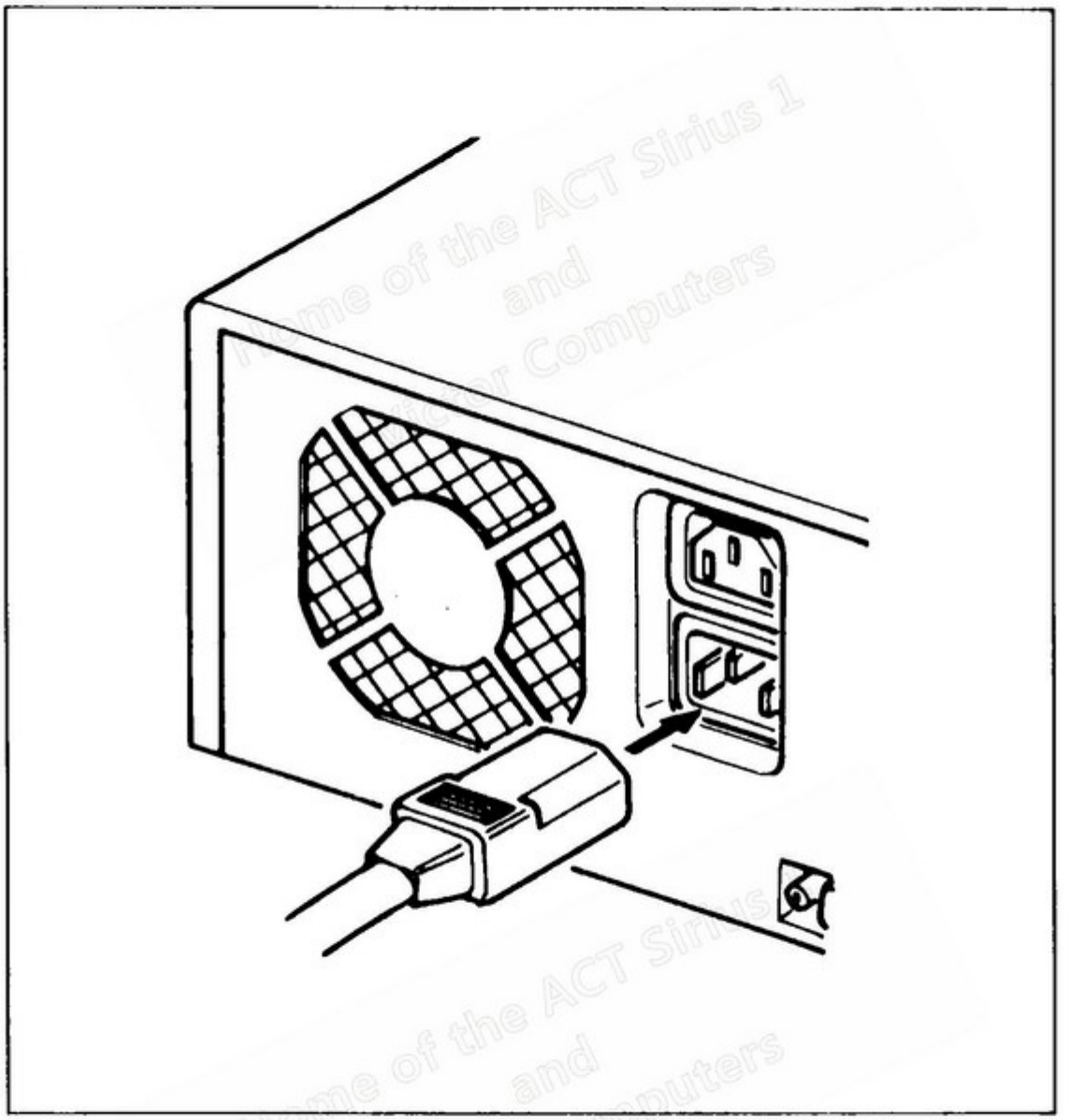

Figure 1-7: Connecting the Power Cord

1.3 First-Time System Startup

Follow these steps to turn your VPC II on for the first time.

1. Before you plug in your VPC II and any external devices, ensure that:

   - ▶ The system unit cover and all four screws securing it are in place
   - ▶ All cables for external devices are securely connected to the system unit
   - ▶ The system unit power switch is turned off
   - ▶ The power switches of all external devices are turned off

2. When you have completed the preceding steps, plug the system unit and all external devices into grounded three-prong 110-volt outlets (or 240-volt, for 240-volt systems). The system unit requires 0.4 amps at 110 volts and 50–60 Hertz. Check the documentation for your external devices for their power requirements.

3. In addition to your master MS-DOS diskettes, you need two blank double-sided diskettes. Label the blank diskettes "Working MS-DOS Diskette (1 of 2)" and "Working MS-DOS Diskette (2 of 2)." Write on the labels before you put them on the diskettes.

4. Remove the cardboard shipping insert(s) from the floppy disk drive(s). Store the shipping insert(s) to use whenever you move the VPC II.

5. Insert master MS-DOS diskette 1 into floppy disk drive A (the top drive in a dual-floppy disk system), but do not close the drive latch. See Figure 1-8.

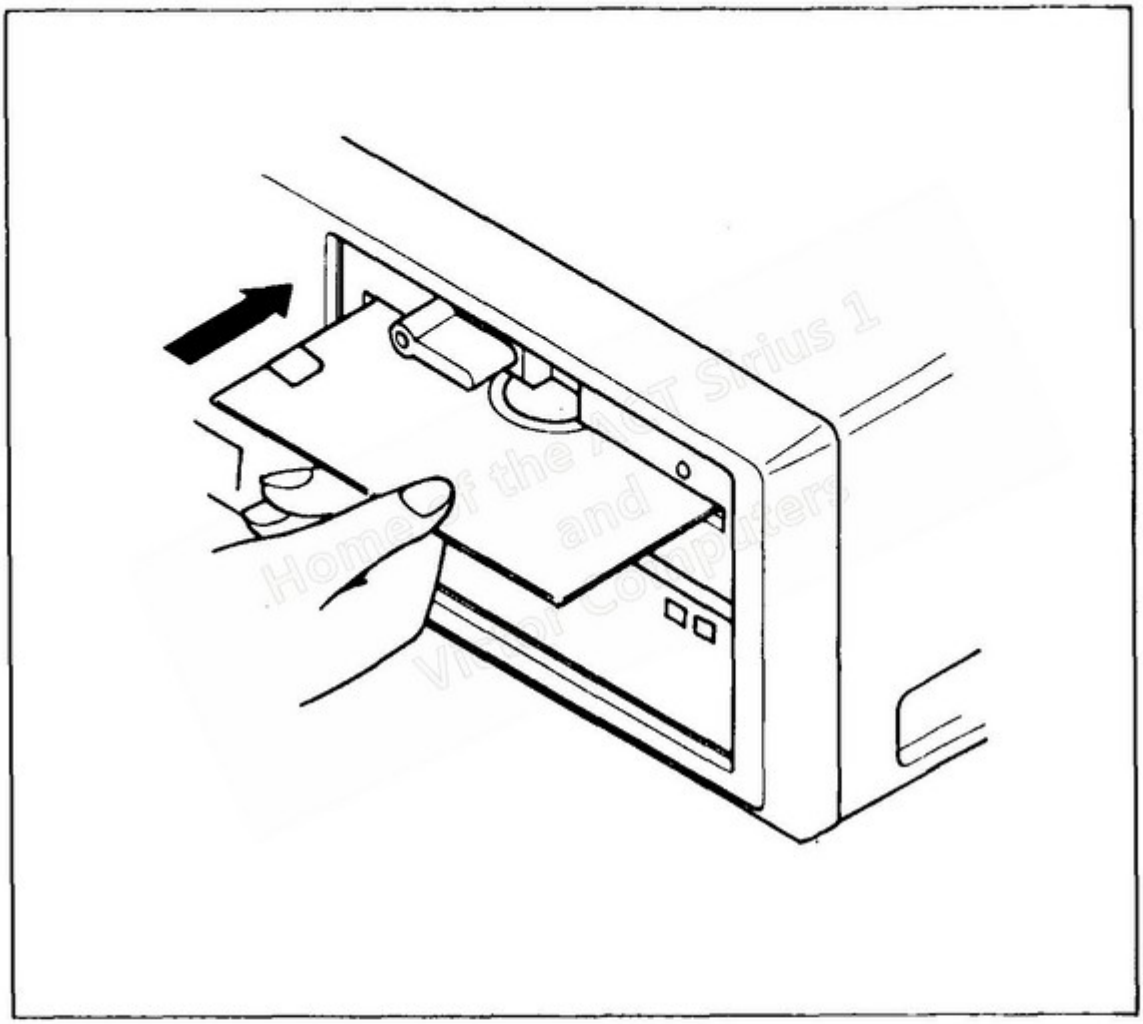

Figure 1-8: Inserting the MS-DOS Diskette

6. Turn the display unit on. The display unit is the only external device that you need to turn on the first time you start the system. During daily operations, however, you should turn **all** external devices on before you turn on the system unit. This practice ensures that power fluctuations caused by turning an external device on will not affect the system unit.

7. Turn the system unit on. When you do so, the system runs its initial power-on diagnostic checks. If these checks pass successfully, you will see the following display during the power-on diagnostics:

```
XXXKB OK
```

XXX is a series of rapidly changing numbers that increment from 64 to the total amount of RAM (in kilobytes) installed in the system (640 kilobytes is standard). If you see any other display during the power-on diagnostics, refer to Appendix F, "Initial Power-On Diagnostics Error Codes."

During the power-on diagnostics, the indicator light(s) on the floppy disk drive(s) light up briefly. If your system has a fixed disk drive, the fixed disk red indicator light also lights briefly.

When you first turn the system on, the green indicator light on the fixed disk drive remains off. After the fixed disk controller passes a self-test and the drive motor is up to operational speed (approximately ten seconds), the green light goes on and blinks rapidly for about two seconds. This blinking indicates that the drive is functioning properly; after two seconds the light should remain on without blinking. If the green light continues to blink, the drive is not functioning properly.

8. While the power-on diagnostics are in progress, turn the disk drive latch clockwise to the locked position, as shown in Figure 1-9.

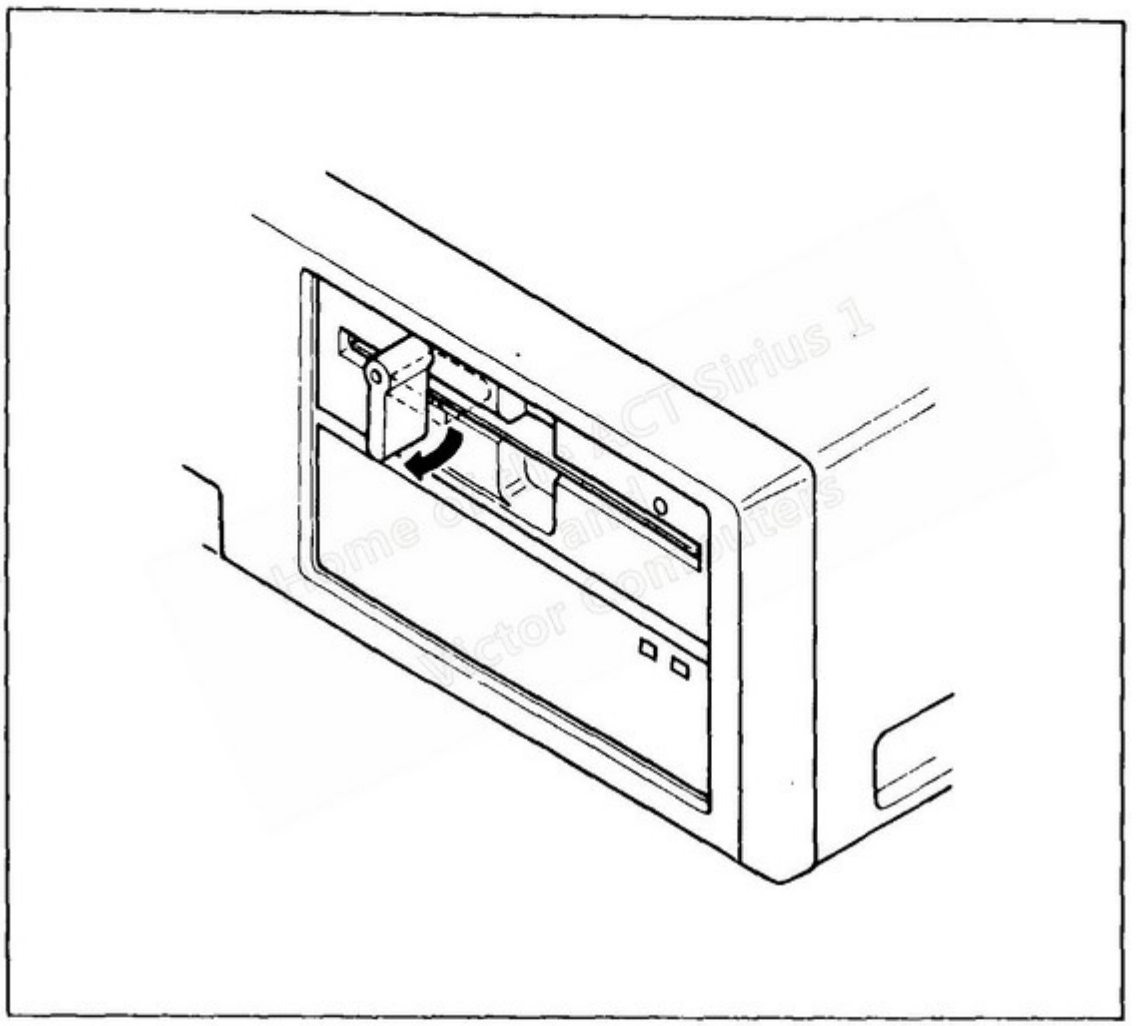

Figure 1-9: Locking the Floppy Disk Drive

9. When the power-on diagnostic checks are complete, the speaker outputs a short beep. The VPC II loads the operating system, and displays the MS-DOS version number and copyright information and the date prompt:

```
MS-DOS version x.xx
(C)Copyright 1981,85 Microsoft Corp.

Current date is Tue  1-01-80
Enter new date (mm-dd-yy):
```

10. Enter the date. The time prompt is added to the screen display:

```
Current time is 0:00:41.30
Enter new time:
```

11. Enter the time. The screen displays the MS-DOS copyright message and the MS-DOS command-line prompt, A>. You can now copy your master diskettes.

1.4 Copying Your Master Diskettes

Once your system is running, the first thing you should do is make working copies of your master MS-DOS diskettes. After you have copied the master diskettes, put them in a safe place and do not use them except to create new working diskettes. This procedure protects you against loss of valuable system software that can occur when diskettes are damaged or become worn through use.

1.4.1 Copying on a Single-Floppy Disk System

This section describes how to make working copies of your master diskettes on a system with only one floppy disk drive. Before you begin, note the following conventions used in this manual:

- MS-DOS commands are shown in lowercase in examples and in uppercase in text. You can type the commands in uppercase, lowercase, or a combination of the two.
- When you are told to "enter" a command, you should type the command and then press the Enter key. Pressing the Enter key sends the command to the operating system to be processed.

Follow these steps to copy your master diskettes:

1. With your master MS-DOS diskette 1 in the floppy disk drive and the MS-DOS command-line prompt (A>) on the screen, enter the MS-DOS DISKCOPY command:

   diskcopy

   After you do so, the screen displays the following prompt:

```
Insert source diskette in drive A:

Strike any key when ready
```

2. The **source diskette** is the diskette you are copying. Because you are going to copy the MS-DOS diskette itself, just press a key to start the copy operation.

   After you press a key, the floppy disk activity light comes on, and the system displays the message

```
Copying I format, 9 sectors per track, 2 side(s).
```

The message remains on the screen while the system copies data from the master MS-DOS diskette into memory. After all the data is copied, this message is displayed:

```
Insert target diskette in drive A:

Strike any key when ready
```


3. Remove the master MS-DOS diskette from drive A and replace it with the blank diskette labeled "Working MS-DOS Diskette (1 of 2)" (the **target diskette**). Then press a key.

   The floppy disk activity light comes on and remains on while the data is copied from memory onto the working diskette. Then this message is displayed:

```
Copy complete.
Copy another? (Y/N)
```

4. Enter Y and follow the same procedure to copy your second master MS-DOS diskette.

You now have working copies of the master MS-DOS diskettes supplied with the VPC II. Store the master diskettes in a safe place.

1.4.2 Copying on a Dual-Floppy Disk System

This section describes how to copy your master MS-DOS diskettes if you have a dual-floppy disk drive system. Before you begin, note the following conventions used in this manual:

- MS-DOS commands are shown in lowercase in examples and in uppercase in text. You can type the commands in uppercase, lowercase, or a combination of the two.
- When you are told to "enter" a command, you should type the command and then press the Enter key. Pressing the Enter key sends the command to the operating system to be processed.

Follow these steps to copy your master diskettes:

1. If you have not yet done so, insert your master MS-DOS diskette 1 in drive A.
2. Insert the diskette labeled "Working MS-DOS Diskette (1 of 2)" in drive B.
3. Enter the MS-DOS DISKCOPY command:

   diskcopy a: b:

   The system copies all the data from the master diskette in drive A to the working diskette in drive B. When the copying operation is complete, the following message is displayed:

```
Copy complete.
Copy another? (Y/N)
```

4. Enter Y. The system prompts you to insert the source and target diskettes. Insert the second master MS-DOS diskette in drive A and the working diskette in drive B.
5. When the copy is complete, the "copy another" prompt is displayed again. Press N for no.

You now have working copies of the master MS-DOS diskettes supplied with the VPC II. Store the master diskettes in a safe place.

1.5 Loading and Resetting the Operating System

You cannot do any work with your VPC II until the MS-DOS disk operating system is loaded into memory. You can load the operating system in three ways:

- Insert your working MS-DOS diskette 1 in drive A and turn the system unit on. While the system performs its initial power-on diagnostics, turn the latch on drive A clockwise to the locked position. Every time you turn the VPC II on, the system performs these diagnostics and then checks drive A for a diskette containing the operating system. If MS-DOS is found on the diskette in drive A, MS-DOS is loaded into memory, and the system is ready for further operations.

- With the system already running, and with the working MS-DOS diskette 1 in drive A, press the reset button on the front of the system unit. The system performs its initial power-on diagnostics and then looks for MS-DOS on the diskette in drive A. This method of loading MS-DOS is a useful way to recover from errors encountered during system operations. **CAUTION:** Resetting the operating system causes you to lose any data in the system's memory at the time of the reset.

- With the system already running, and with the MS-DOS diskette 1 in drive A, press the Ctrl, Alt, and Del keys simultaneously. The operating system is reset, but the power-on diagnostics do not run. This method can also be used to recover from errors. **CAUTION:** This procedure causes all data currently in memory to be lost.

The preceding discussion assumes that you are using a system without a fixed disk or that you have not created a partition on the fixed disk from which you can boot MS-DOS. If you have a system with a bootable partition on the fixed disk, you can load the operating system from fixed disk drive C, instead of drive A. See Chapter 3 for a full discussion of fixed disk operations.

When the operating system is successfully loaded, a prompt appears similar to the following:

```
Current date is Tue  1-01-1980
Enter new date (mm-dd-yy):
```

Enter the correct date in the format mm-dd-yy, where **mm** is the month, **dd** is the day, and **yy** is the year. If you do not want to record the current date, just press Enter to leave the date as it is.

When you enter the current date, the system stamps the date on every file you create or update. This feature helps you determine the most current version of your files. If you do not enter the date, the system stamps the default date (in this case, 1-01-80) on your files.

Next, a prompt similar to the following is displayed:

```
Current time is 0:00:41.30
Enter new time:
```

Enter the correct time, or press Enter to leave the time as it is. Just as for the date, the system stamps the current time on your files. You do not need to specify seconds and hundredths of seconds, although you can if you want.

If you enter the date or time incorrectly, the message "Invalid date" or "Invalid time" is displayed and you are prompted to re-enter the date or time.

The screen now displays the MS-DOS command-line prompt, A> (or C> if you loaded MS-DOS from fixed disk drive C) and a blinking cursor.

Once the operating system is loaded, you can begin working with your VPC II. You can use the operating system commands, some of which are briefly described in Chapter 5 of this manual. See the *MS-DOS 3.1 Reference* for a full description of MS-DOS commands and options.

You can also begin writing programs in VBASICA. For instructions on using VBASICA, see your VBASICA manual.

You can also load and run any application programs you have purchased. See the documentation provided with your application programs for directions.

1.6 Turning the System Off

Before you turn the system off, make sure you save the disk file you are working with. Procedures for saving files vary from program to program; see the documentation for the application program you are using.

You should also remove the diskette from drive A. If you plan to use the same diskette the next time you turn the system on, you can leave the diskette in the drive, but be sure to turn the drive latch counterclockwise to the open position. This practice ensures that the diskette is not damaged by a power surge to the disk drive.

When you turn the system off, turn the system unit off **first** and then turn off the display unit and any other connected devices. Following this sequence ensures that power fluctuations caused by turning external devices on and off do not damage the circuits of the system unit.

1.7 Moving the System

This section describes how to prepare disk drives for moving and how to disconnect the system components.

1

1.7.1 Preparing the Fixed Disk Drive(s) for Moving

If your system has a fixed disk drive, it is important that you **prepare the drive before moving the system**, whether for a short move or a cross-country move.

The read/write heads in the fixed disk drive are extremely delicate. Even the minor shock that might occur when you set the system unit on a desk can cause the heads to hit the disk surface, possibly damaging both the heads and the disk itself. Before you move the system unit, you should "park" the fixed disk drive heads.

With the system diskette in drive A and the MS-DOS command-line prompt (A>) on the screen, type PARK and press Enter. The PARK utility parks the heads and returns you to the system prompt.

Once you have parked the heads, you should turn the system off without entering any further commands. Entering further commands may cause fixed disk activity, which "unparks" the heads. When you set the system up in its new location, you do not have to do anything specific to "unpark" the heads; operating the system does so automatically.

1.7.2 Preparing the Floppy Disk Drive(s) for Moving

Before you move the system unit, first make sure it is turned off. Then put the shipping insert(s) that came with the system back in the floppy disk drive(s). Turn the drive latch to the locked position. If you have lost the shipping insert(s), you can use a worn or damaged diskette instead. Do not use a diskette that contains any valuable data.

1.7.3 Disconnecting System Components

Even if you are moving the system only a short distance, you should disconnect all the components from the system unit. Disconnect each cable, including the power cord, from the system unit. If possible, disconnect the other ends of the cables from the devices.

If the move is a short one (within the same building), you can carry the separate components and their cables to the new location without any further preparation.

If the move involves transporting the system by vehicle, take the following steps:

1. Coil all cables and cords neatly and secure them in the coiled position with strong tape.
2. Tape the coiled cables and cords to the tops of the components.
3. If possible, repack each component in the original packaging materials. If these are not available, pack each component in a well-padded box, and handle the boxes carefully.

When you reach the new location, set the system up as described in Section 1.2.

1.8 Cleaning the System

The VPC II should not ordinarily require any cleaning except occasional dusting. Dust each component of the system with a soft dry cloth.

If a component requires further cleaning, use a soft cloth **lightly** moistened with water or a mild soap. Never use thinner, benzine, or alcohol, because they will damage the surface of the computer.

Never apply water or any other liquid directly to any component of the system.

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2

More About Diskettes

This chapter explains how diskettes work and offers suggestions for their proper care and use.

2.1 How Diskettes Work

Figure 2-1 shows an external view of a typical diskette, with each part labeled. The parts of the diskette function as follows:

- The square object you hold when you handle the diskette is a permanently sealed protective jacket within which a circular mylar diskette rotates. Never open or remove this jacket.
- The label on the diskette helps you identify your diskettes and determine the contents.
- The write-protect notch protects you from accidentally erasing valuable data. It is discussed in more detail later in this chapter.
- The read/write window is the opening in the protective jacket through which the read/write heads of the floppy disk drive make contact with the mylar diskette inside the jacket. The diskette's envelope protects the read/write window when the diskette is not in use.
- The index hole is the small hole located near the hub, or center of the diskette. It is used to indicate the starting and ending of a circular recording track on the diskette. This index hole is a reference point for the system to identify what is recorded on the diskette.

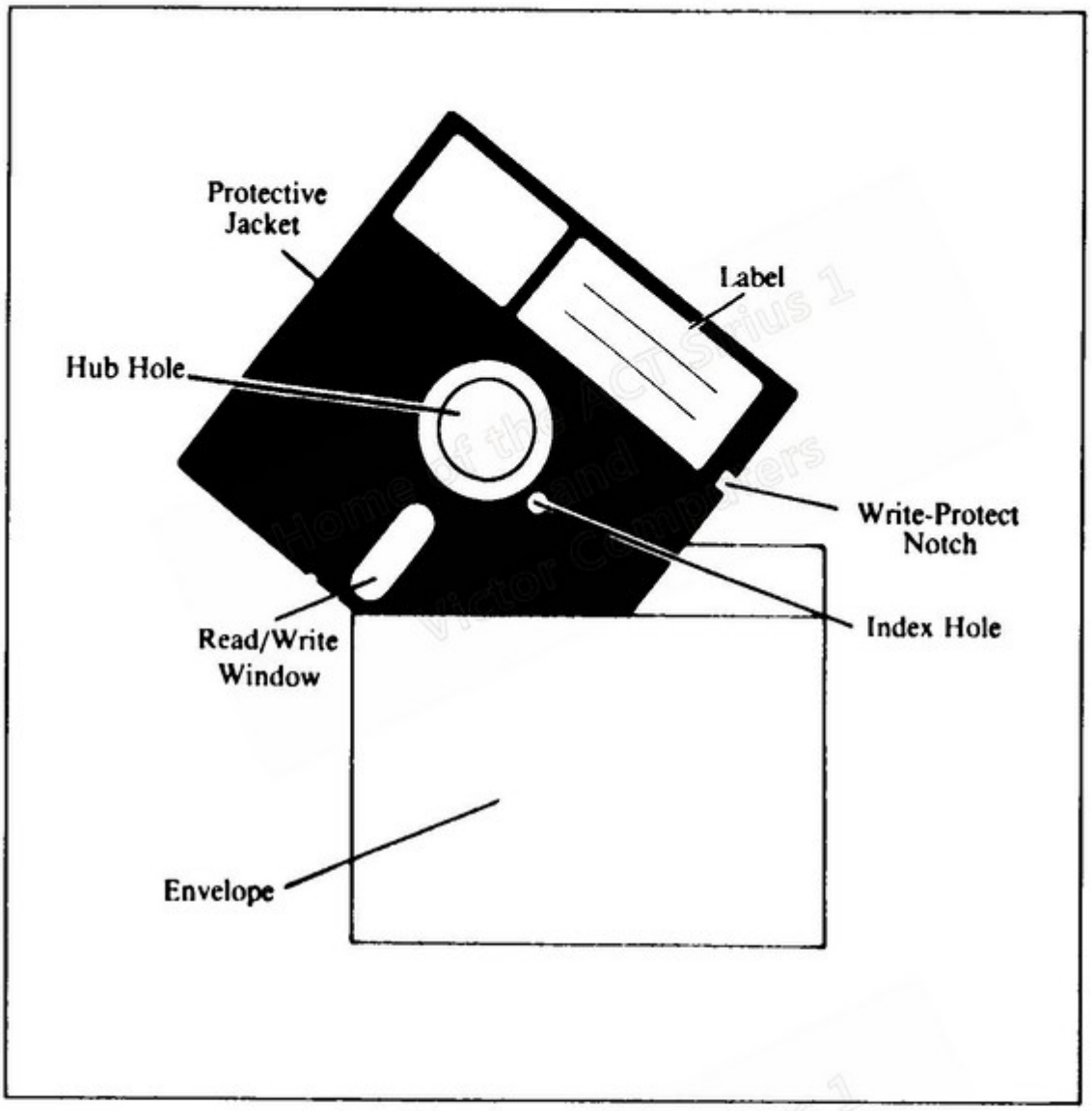

Figure 2-1: External View of a Diskette

Figure 2-2 is a conceptual diagram of the mylar diskette removed from the protective jacket. (An actual diskette does not have any lines on its surface.)

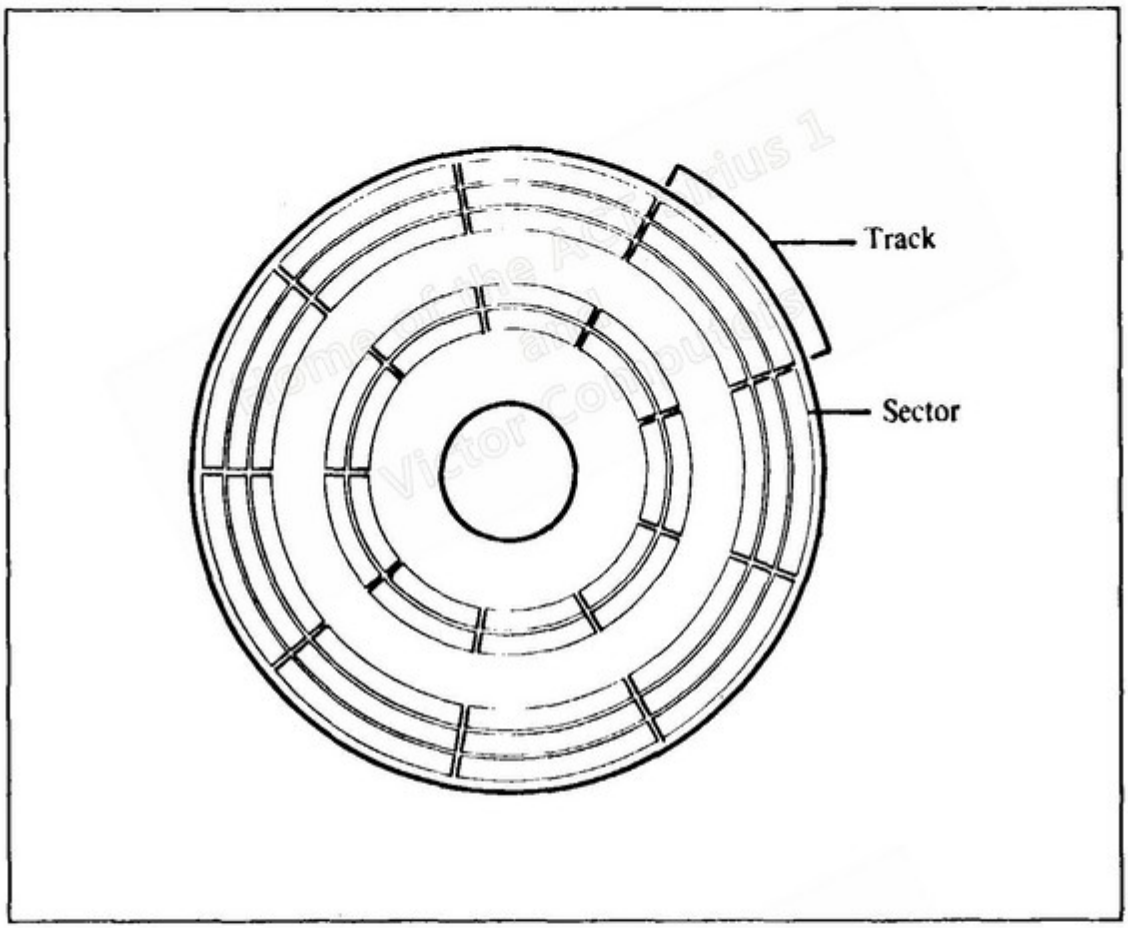

Figure 2-2: Mylar Diskette with Tracks and Sectors

The diskette inside the protective jacket is made of mylar plastic and is coated with magnetic material much as audio recording tape is. Information is recorded on and read from the diskette's surface magnetically by the floppy disk drive's read/write heads.

Unlike the continuous modulated signal on an audio tape, the information on the diskette is recorded as a series of bits. A **bit** (or **binary digit**) is the smallest unit of magnetic surface that the read/write heads are capable of recognizing.

The information on the diskette is recorded in a series of concentric circles called **tracks** (refer to Figure 2-2). The set of tracks in a single vertical plane of a diskette is called a **cylinder**. On a double-sided diskette, there are two tracks per cylinder. Double-sided diskettes contain 40 cylinders numbered 0 through 39. The outermost cylinder of the diskette is 0; the innermost cylinder is 39.

The tracks on a diskette are divided into **sectors**, as shown in Figure 2-2. A diskette can be formatted to have 8 or 9 sectors.

When you insert the diskette in the floppy disk drive and lock the drive latch, the center cone of the drive is pushed into the hole or hub in the center of the diskette. When the drive is activated, the center cone spins the mylar diskette inside its protective jacket, which remains stationary.

As the diskette spins, its entire recording surface passes under the read/write windows on each side of the diskette. The drive's read/write heads move back and forth across the long direction of the windows, seeking the appropriate track to read from or write to. Once the track is found, the heads stop and read or write data as the diskette spins past.

The disk drive controller software determines which tracks and sectors to write data to and creates a record of which tracks and sectors contain specific files.

2.2 Care and Handling of Diskettes

To ensure long diskette life and satisfactory operation of your system, observe the following precautions:

- Always make at least one backup copy of every diskette that contains valuable information (Section 2.5 describes the backup procedure). Even high-quality diskettes that are properly cared for eventually wear out. If a diskette containing important program or data files is damaged or destroyed, you can use your backup copy.
- Never touch the surface of the diskette. The oil on your hands can contaminate the diskette's recording surface as well as the drive's read/write heads.
- Do not write on a diskette label once the label is attached to the diskette. If you **do** write on the label after attaching it, use a felt-tip pen and press lightly. Excessive pressure on the outside of the diskette's protective jacket can damage the recording surface inside.
- Do not stack diskettes on top of one another; stand them on edge in a storage container.
- Do not turn the system unit on or off with a diskette in a locked drive. Either remove the diskette from the drive or open the drive latch.
- Do not expose diskettes to direct sunlight, moisture, excessive humidity, or dust or other foreign substances. Always keep diskettes in their envelopes when you are not using them.
- Do not expose diskettes to extreme temperatures, which can damage the diskette and destroy data. Even moderate fluctuations in temperature can create slight contraction and expansion of the diskette, and can cause errors when you read from or write to the diskette.

  If a diskette is exposed to extremely high or low temperature, allow an hour or more for the diskette to reach room temperature before you use it.
- Do not expose diskettes to magnetic fields such as those generated by audio speakers, telephones, and other electronic equipment.

2.3 Types of Diskettes

The VPC II can use either single-sided, double-density diskettes or double-sided, double-density diskettes.

- Double-sided, double-density diskettes store 360 KB of data, 180 KB on each side (9-sector format) or 320 KB of data, 160 KB on each side (8-sector format).
- Single-diskettes can store 180 KB of data (9-sector format) or 160 KB of data (8-sector format) all on one side.

You will probably want to use double-sided diskettes because of their higher storage capacity. The double-sided drives of the VPC II, however, are capable of formatting, reading, and writing to both double-sided and single-sided diskettes, and to both 8-sector and 9-sector tracks.

Formatting a single-sided diskette is described in Section 2.6. Once a diskette is formatted as single-sided, the disk drive automatically recognizes it as such and correctly reads data from and writes data to the diskette without any special action on your part.

2.4 Inserting and Removing Diskettes

Figure 2-3 shows the correct way to insert a diskette into the floppy disk drive. The label side of the diskette is facing up, and the read/write window enters the drive first.

Once the diskette is fully inserted in the drive, turn the drive latch clockwise to the locked position, as shown in Figure 2-4.

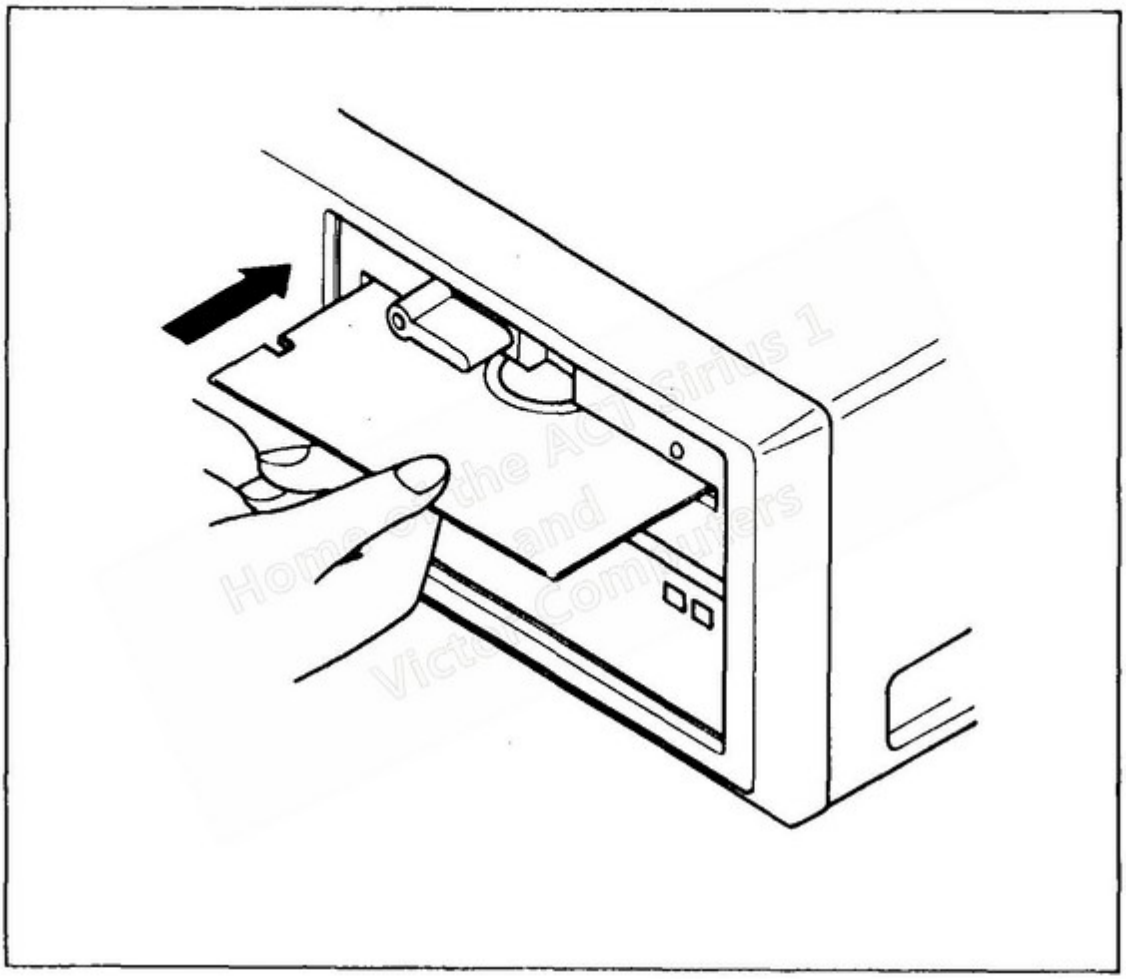

Figure 2-3: Inserting a Diskette

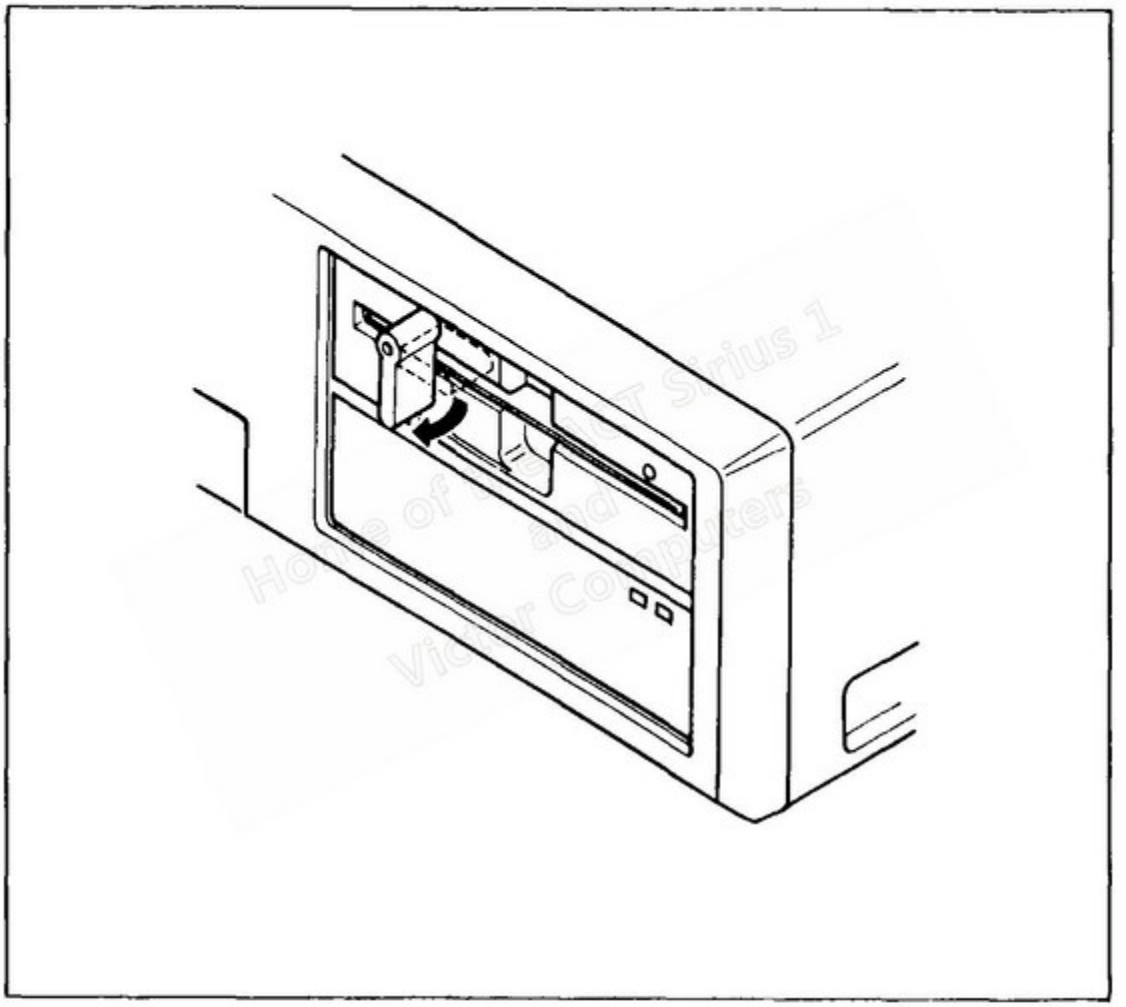

Figure 2-4: Locking the Drive Latch

When you are preparing to start the system, you can insert the system diskette in the drive before you turn the system unit on. Do not, however, lock the drive latch until **after** you turn the system unit on.

When you are ready to remove a diskette from the drive, first make sure that no data files are open. The procedure for closing files depends on the program you are using; consult your application program documentation for instructions.

Once you are sure that there are no open files, check that the drive activity light is off. Then turn the drive latch counterclockwise to the unlocked position and remove the diskette, being careful not to bend it or touch its recording surface. Return the diskette to its envelope.

2.5 Making Backup Copies of Diskettes

It is strongly recommended that you make backup copies of diskettes that contain valuable information. You should already have backed up the master MS-DOS diskettes that you received with the VPC II, as described in Chapter 1.

You should also back up your application program diskettes (if they are not copy-protected) and your data diskettes.

To copy a diskette using the MS-DOS DISKCOPY command, follow the steps described in Sections 1.4.1 and 1.4.2.

2.6 Formatting Diskettes

Formatting divides a diskette into tracks and sectors and prepares the diskette to receive data.

When you copy an entire diskette using the DISKCOPY command, the target diskette is automatically formatted during the copying operation (if it was not already formatted). When you want to use a new diskette for any purpose except to make a copy of another diskette, however, you must first format the new diskette.

2.6.1 Formatting on a Single-Floppy Disk System

To format a double-sided diskette on a single-floppy disk drive system, use the MS-DOS FORMAT command. Insert MS-DOS diskette 1 in the floppy disk drive and enter

```
format a:
```

The following message is displayed:


```
Insert new diskette for drive A:
and strike ENTER when ready
```

Remove the MS-DOS diskette from the drive and replace it with a new diskette. (You can also format a used diskette, but the formatting procedure destroys any data already on the diskette.) Press Enter.

The floppy disk activity light turns on, and the screen displays the message "Formatting..." until the formatting operation is complete. The screen then displays a message telling you that formatting is complete and telling you how much storage space (in bytes) is available on the diskette. The following prompt is also displayed:

```
Format another (Y/N)?
```

If you want to format another diskette, press Y and follow the prompts that appear on the screen. If you do not want to format another diskette, press N.

When you press N in response to the "Format another" prompt, the MS-DOS command-line prompt returns to the screen.

To format a single-sided diskette, the procedure is the same, except that you enter the FORMAT command with the /1 option, as follows:

```
format a: /1
```

2.6.2 Formatting on a Dual-Floppy Disk System

If your system has two floppy disk drives, you can format a double-sided diskette without removing the MS-DOS diskette from drive A.

Insert MS-DOS diskette 1 in drive A and the new diskette to be formatted in drive B. (You can also format a used diskette, but the formatting procedure destroys any data already on the diskette.) Enter

```
format b:
```

The following message is displayed:

```
Insert new diskette for drive B:
and strike ENTER when ready
```

Press any key to begin the formatting operation.

The floppy disk activity light turns on, and the screen displays the message "Formatting..." until the formatting operation is complete. The screen then displays a message telling you that formatting is complete and telling you how much storage space is available on the diskette. The following prompt is also displayed:

```
Format another (Y/N)?
```

If you want to format another diskette, press Y and follow the prompts that appear on the screen. If you do not want to format another diskette, press N.

When you press N in response to the "Format another" prompt, the MS-DOS command-line prompt returns to the screen.

To format a single-sided diskette, the procedure is the same, except that you enter the FORMAT command with the /1 option, as follows:


```
format b: /1
```

2.6.3 Using FORMAT to Create a Bootable Diskette

As explained in Chapter 1, the MS-DOS operating system is loaded automatically from your MS-DOS diskette whenever you start or reset the system with the MS-DOS diskette in drive A. A diskette from which the operating system is loaded in this way is called a **boot diskette** or **bootable diskette.**

Although the MS-DOS diskette contains many program files, only three of them are required to make a diskette bootable. You can copy those three files to another diskette and make that diskette bootable. Then most of the storage capacity of the bootable diskette is still available for application programs or data files.

It is particularly convenient to copy your application programs onto bootable diskettes. That way you can load both the operating system and the application program from the same diskette. You then need to use the MS-DOS diskette only when you want to use one of the MS-DOS utility programs or external commands (see Chapter 5, "Overview of MS-DOS," for an explanation of internal and external commands).

Two of the files needed to create a bootable diskette, MSDOS.SYS and IO.SYS, are "hidden" files. This means that they do not appear on a directory listing of the diskette and that they cannot be copied with the COPY command. The third file is COMMAND.COM, the command processor program. You must copy these files to a diskette during the formatting operation. To do so, enter the FORMAT command with the /S (system) option.

If you have a single-floppy disk system, enter

```
format a: /s
```

If you have a dual-floppy disk system, enter

```
format b: /s
```

This command formats the diskette in the specified drive and then copies the system files MSDOS.SYS, IO.SYS, and COMMAND.COM to the diskette.

2.7 Write-Protecting Diskettes

You can protect yourself from losing important data by write-protecting diskettes. The floppy disk drive cannot write on a write-protected diskette, nor can it erase files from a write-protected diskette.

Write-protection is not practical for diskettes on which you continually create and update files. Write-protection is useful for operating system diskettes, application program diskettes, and any data diskettes whose files do not require further updating.

Every blank diskette has a write-protect notch (refer to Figure 2-1). Whenever you perform a write operation, a sensor in the floppy disk drive checks to see whether or not the notch is present. If the notch is present, the drive performs the write operation.

If the notch is absent or is covered up, the drive cannot perform a write operation, and the operating system generates an error message such as the following:

```
Write protect error writing drive x
```


x identifies the drive.

When you buy a box of diskettes, the package includes one or more sheets of small gummed rectangles. These are write-protect tabs. To write-protect a diskette, peel a write-protect tab from its backing and use it to cover the write-protect notch of the diskette, as shown in Figure 2-5.

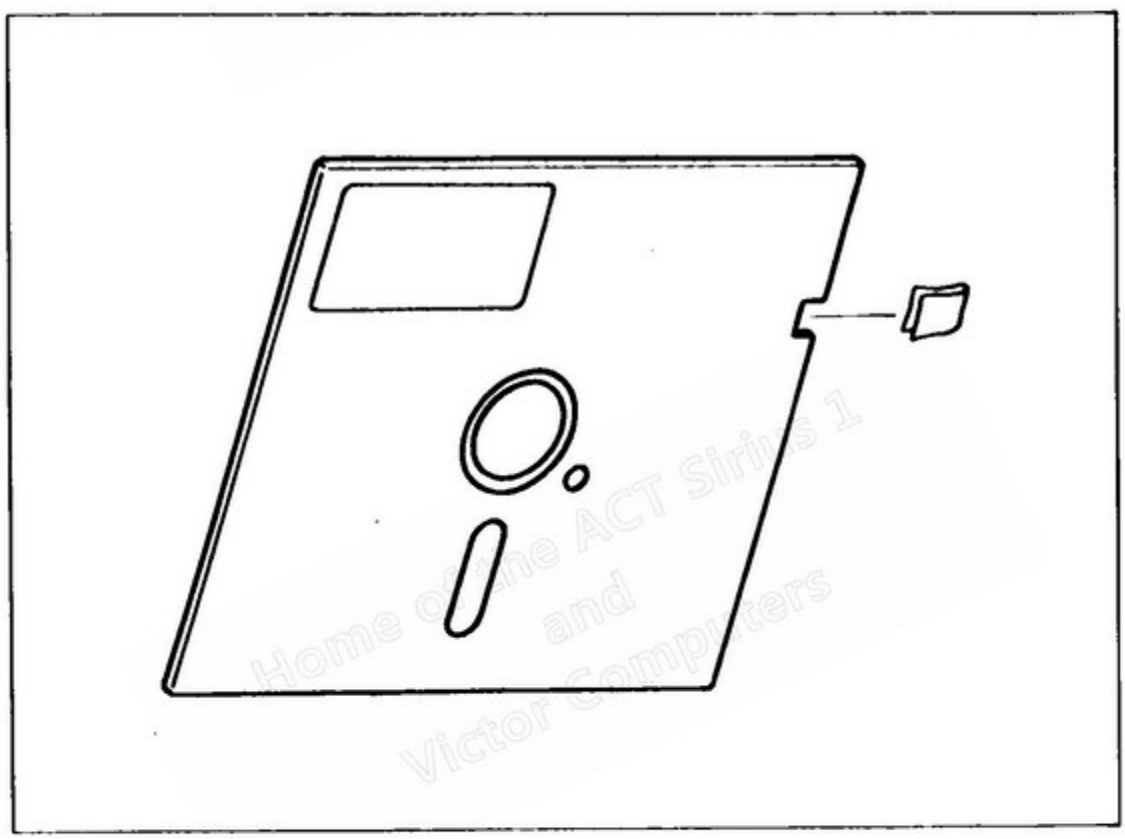

Figure 2-5: Attaching a Write-Protect Tab

The Fixed Disk

This chapter describes how a fixed disk works and how to set up your fixed disk. Then the chapter gives the procedures for backing up and restoring fixed disk files and offers suggestions for operating your fixed disk system.

If your system does not have a fixed disk, proceed to Chapter 4.

3.1 How a Fixed Disk Works

A fixed disk, like a floppy diskette, stores information magnetically in the form of bits. A fixed disk drive contains one or more rigid metal disks (often referred to as platters) that are mounted permanently within the drive. Figure 3-1 shows a typical fixed disk drive.

Because a fixed disk is rigid and because the design of the disk drive is very precise, data can be stored much more densely on a fixed disk than on a diskette. This storage capacity is one of the two main advantages of a fixed disk over a diskette.

The other advantage is speed. The read/write heads of a floppy disk drive touch the surface of the diskette when they perform read/write operations. This contact wears the diskette's surface and greatly limits the speed at which the diskette rotates. In contrast, the read/write heads of a fixed disk drive never touch the surface of the disk while the disk is spinning; instead they hover a few micrometers above the surface of the disk. Thus fixed disks rotate at much higher speeds than diskettes do, and data can be written to and read from fixed disks much faster than from diskettes.

Fixed disk drives are very delicate. Subjecting the system to shock or vibration while the fixed disk is operating can cause one or more of the read/write heads to strike the surface of the spinning disk. Such a "head crash" is disastrous both to the read/write head and to data stored on the fixed disk. Therefore, **never move the system unit while the fixed disk drive is operating.**

Even when the fixed disk drive is not operating, it is dangerous to move the system without first parking the read/write heads. Section 1.7 describes this procedure.

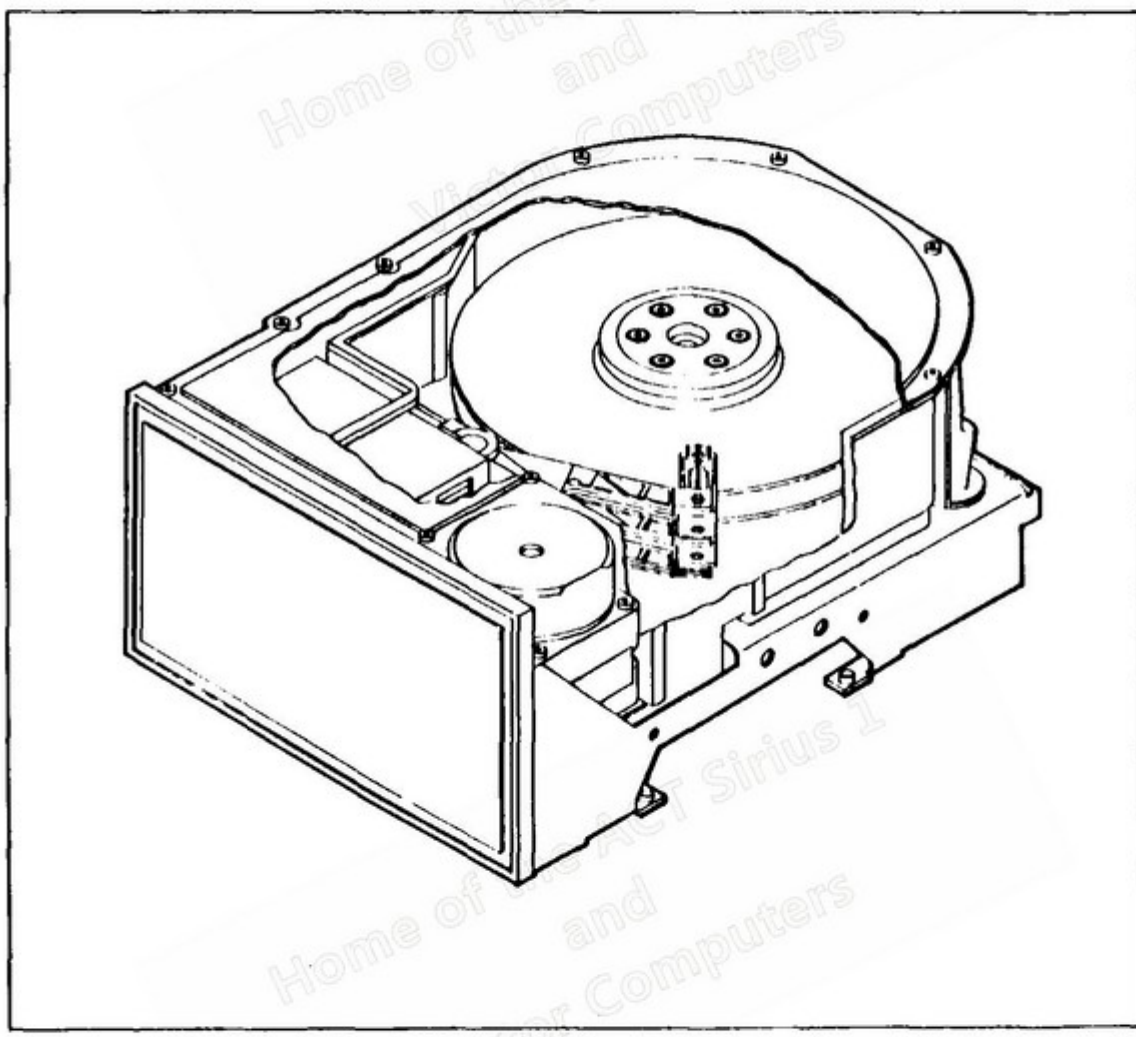

Figure 3-1: Fixed Disk Drive

3.2 Setting Up the Fixed Disk

Before you can use your fixed disk drive, you must perform several procedures to prepare it to receive data. This section describes these procedures.

3.2.1 Creating an MS-DOS Partition

You can divide the fixed disk into as many as four separate areas called **partitions**. You can specify the size and location of each partition you create.

You need more than one partition only if you are going to use more than one operating system. Each operating system you use requires its own formatted partition on the fixed disk. This section assumes that MS-DOS is the only operating system you are going to use with the fixed disk, and that you need to create only one MS-DOS partition.

If you plan to use one or more additional operating systems, most of the discussion that follows is still applicable. The only difference is that you should create an MS-DOS partition of limited size, leaving room for other partitions. Any additional partitions must be created by the operating system that will reside in that partition. Refer to the applicable operating system documentation for directions.

To create an MS-DOS partition, insert MS-DOS diskette 1 in the floppy disk drive. Enter the following command:

```
fdisk
```

FDISK is the MS-DOS utility program used to create the MS-DOS partition. The FDISK Menu is displayed:

```
FDISK Menu

Choose one of these options:

     1.  Create MS-DOS Partition
     2.  Activate Partition
     3.  Delete MS-DOS Partition
     4.  Display Partition Information

Enter your choice: [1]

Press Esc to return to MS-DOS
```


Option 1, "Create MS-DOS Partition," is selected by default. That is, to select option 1 just press the Enter key. When you do so, the following screen is displayed:

```
Create MS-DOS Partition

Do you want to use the entire fixed
disk drive for MS-DOS (Y/N).....? [Y]

Press Esc to return to FDISK Menu.
```

Press Enter to choose the default response (Y for yes) and use the entire fixed disk for the MS-DOS partition. (If you plan to use an additional operating system, enter N and follow the prompts displayed on the screen.)

When you press Enter to indicate that you want to use the entire fixed disk for MS-DOS, the following message is displayed:

```
System will be rebooted.

Insert MS-DOS diskette in drive A:
Press any key to reboot. . .
```

The MS-DOS diskette should already be in drive A. Press any key; the operating system reboots. You have now created an MS-DOS partition that occupies the entire fixed disk.

Options 2, 3, and 4 from the FDISK Menu are discussed briefly in the next sections.

Activate Partition

This option applies only if you do not use the entire fixed disk as an MS-DOS partition. If you create more than one partition, and you want to be able to load MS-DOS from the MS-DOS partition of the fixed disk when you turn the system on, you must first activate the MS-DOS partition. (See Section 3.2.4 for more information.)

If the entire fixed disk is an MS-DOS partition, it is automatically activated.

Delete MS-DOS Partition

By selecting this option, you can delete the current MS-DOS partition. If you want to change the size of the MS-DOS partition, for example, you must delete the current MS-DOS partition and create a new one.

CAUTION: Deleting the MS-DOS partition destroys files stored there. Back up files stored in the MS-DOS partition before you delete it.

Display Partition Information

When you select option 4, the following information about the fixed disk partition(s) is displayed:

- The number of partitions: 1 to 4
- The status of each partition: A (active) or N (not active)
- The type of each partition: MS-DOS or non-MS-DOS
- The number of the cylinder at which each partition starts
- The number of the cylinder at which each partition ends
- The size of each partition in cylinders

3.2.2 Formatting the MS-DOS Partition

You must format the MS-DOS partition of the fixed disk before it can store data in the MS-DOS format.

The MS-DOS FORMAT command used with the /S option formats the fixed disk drive and copies the two hidden operating system files (MSDOS.SYS and IO.SYS) and COMMAND.COM to the drive. Insert the MS-DOS diskette in the floppy disk drive. Enter

```
format c: /s
```

You are warned that the formatting operation destroys any data on the fixed disk, and you are given an opportunity to cancel the operation.

If you have no data on the fixed disk, or have already backed up all your files, enter Y to go ahead with the formatting operation. This message is displayed:

```
Formatting...
```

When the formatting operation is finished, the message changes to the following:

```
Formatting...Format complete
```

The MS-DOS partition is now formatted and the two hidden system files and COMMAND.COM have been copied to drive C. If you want to format a second fixed disk drive, use D: in the FORMAT command to specify drive D.

3.2.3 Copying System Files to the Fixed Disk

Once the MS-DOS partition of the fixed disk is formatted and the two hidden system files and COMMAND.COM have been copied, you can copy the remaining contents of your MS-DOS diskette to the fixed disk. To do so, insert the MS-DOS diskette in drive A and enter

```
copy *.* c:
```

The system copies all the files from the MS-DOS diskette in drive A onto the MS-DOS partition of the fixed disk. As the files are copied, their names are displayed on the screen. When the copying operation is complete, the MS-DOS command-line prompt returns to the screen.

3.2.4 Booting the System from the Fixed Disk

Whenever you turn the system unit on, press the reset button, or simultaneously press the Ctrl, Alt, and Del keys, the system unit looks for a diskette containing the operating system in drive A. If the system diskette is in drive A, and the drive latch is locked, the system unit loads the operating system from that diskette.

If there is no diskette in drive A, or if the drive latch is open, the system unit attempts to load the operating system from drive C.

Once you have copied all the operating system files to drive C, you can load (boot) the operating system from fixed disk drive C just by turning on or resetting the system unit with the drive A latch open.

3.3 Backing Up and Restoring the Fixed Disk

A fixed disk drive is tremendously convenient because it allows you to store large quantities of data without having to change and keep track of many floppy diskettes. This advantage of the fixed disk drive, its high storage capacity, also makes it possible for you to lose valuable data due to carelessness or a power failure or other accident. It is therefore essential that you back up your fixed disk regularly.

3.3.1 Backing Up Fixed Disk Files

Use the MS-DOS BACKUP command to back up your fixed disk files onto diskettes. The BACKUP command includes many options that are fully explained in the *MS-DOS 3.1 Reference.* Some basic backup procedures are described in this section.

Before you can back up the fixed disk, you must format the diskettes you plan to use. Refer to Section 2.6 for the format procedure.

Backing Up the Entire Fixed Disk

Log on to drive C (the C> prompt is displayed), and make sure that drive C contains all the MS-DOS utility programs. Enter the following BACKUP command:

```
backup c: a: /s
```

This command backs up all files on drive C, including those in any subdirectories, onto diskettes in drive A.

C: specifies the source drive, that is, the drive from which files are to be copied.

A: specifies the target drive, that is, the drive onto which files from the source drive are to be backed up.

/S specifies that the backup includes all files in any subdirectories of the source drive. (See Section 5.4 for more information about directories and subdirectories.)

When you enter the command, the following prompt and warning are displayed:

```
Insert backup diskette 01 in drive A:
Warning! Diskette files will be erased
Strike any key when ready
```


The first line of the prompt refers to the number of the backup diskette. As many as 56 double-sided diskettes are required to back up a full 20-MB fixed disk. It is important that you number the diskettes sequentially so you can later restore files in the same order in which you backed them up (see Section 3.3.2).

As the warning indicates, this BACKUP command writes over any files on the target diskette. You should use only blank formatted diskettes or diskettes containing obsolete data as target diskettes.

Insert backup diskette 01 in drive A and press any key to start the backup. The system displays the message shown below and lists the files as they are backed up.

```
*** Backing up files to diskette 01 ***
```

When diskette 01 is full, the backup operation pauses, and the system displays the following prompt:

```
Insert backup diskette 02 in drive A:
Warning! Diskette files will be erased
Strike any key when ready
```

Replace diskette 01 in drive A with diskette 02, and press any key to continue the backup operation. As the backup operation fills additional diskettes, the system continues to prompt you to change diskettes and press any key to continue. When the backup is complete, the MS-DOS command-line prompt returns to the screen.

After you have backed up the entire contents of your fixed disk, store the backup diskettes in a safe place, preferably in a different room from your VPC II.

If you use your VPC II regularly, you should back up your fixed disk at least once a week.

Backing Up Modified Files Only

As you add more application programs and data files to the fixed disk, the backup process can become time-consuming. Many of the files on your fixed disk, such as operating system files and application program files, will probably never be modified. Other files will be modified only occasionally. You can reduce the time spent in backing up the fixed disk by backing up only those files that have been modified since the last backup.

BACKUP marks the files it has copied. If the file is subsequently modified, the mark is erased. The next time you run BACKUP, the program looks at each file for the backup mark, and can thus distinguish between files that have been modified or added since the last backup and those that remain unchanged.

To back up only modified files, log on to drive C and make sure BACKUP.EXE is on that drive in the current directory. Enter this command:

```
backup c: a: /s /m
```

C: specifies the source drive; **A:** specifies the target drive.

/S specifies that the backup includes files in subdirectories of the source drive.

/M specifies that only files that have been modified or added since the last backup are included in the current backup.

Warning: BACKUP erases files on the target diskette before making the backup copy, so you will have backup copies **only** of recently modified files. Do not use this form of the BACKUP command with the same diskettes you used to back up the entire fixed disk. Instead, use new diskettes each time you run BACKUP.

If you experience a fixed disk failure and have to restore all files to the fixed disk, run RESTORE once for each **set** of backup diskettes. Start with the oldest set and work forward. You will then have a restored fixed disk that is current as of the last backup. (Section 3.3.2 describes the restore procedure.)

Another way to back up only modified files is to use the Add option. Enter this command:

```
backup c: a: /s /m /a
```

C: specifies the source drive; **A:** specifies the target drive.

/S specifies that the backup includes files in subdirectories of the source drive.

/M specifies that only files that have been modified or added since the last backup are included in the current backup.

/A specifies that the files backed up by this backup operation are added to the files on the original backup diskettes.

When you enter this form of the BACKUP command, you are prompted to insert the **last** backup diskette in drive A. The modified files are added to the files on that diskette. The system prompts you to insert diskettes as necessary. The numbering of additional diskettes should continue the sequence of the original backup diskettes.

With this BACKUP command, you create one growing set of backup diskettes rather than a growing number of sets. You can also restore the fixed disk with a single RESTORE command.

Whether you use BACKUP with the Modify option alone or with the Modify and Add options, the number of your backup diskettes will gradually increase. Files that are modified repeatedly will be backed up repeatedly, and your backup diskettes will contain many versions of the same files. Periodically, therefore, you should perform a full fixed disk backup, eliminating repeated versions of frequently modified files.

3.3.2 Restoring Fixed Disk Files

The BACKUP and RESTORE commands work together. Use RESTORE to restore backed up files to the fixed disk in case files on the fixed disk are lost.

RESTORE works only with files that have been backed up with the BACKUP command; RESTORE cannot restore files backed up with the COPY command.

Like BACKUP, RESTORE has several options, which are discussed thoroughly in the *MS-DOS 3.1 Reference*. For most restore operations, you can use the following command:

```
restore a: c: /s
```

If, for example, you have lost the data on your fixed disk, follow this procedure. Insert your MS-DOS diskette 1 in drive A and log on to drive A. Enter the RESTORE command shown above and press Enter.

A: specifies that drive A is the source drive for the restore operation; that is, the diskettes containing the backup files will be inserted in drive A during the restore operation.

C: specifies that drive C is the target of the restore operation; that is, the files from the diskettes in drive A will be restored to drive C.

/S specifies that all subdirectories and their files are included in the restore. If you use /S with BACKUP, you must also use /S with RESTORE. Otherwise, only files from the root directory are restored.

When you enter the preceding RESTORE command, this prompt is displayed:

```
Insert backup diskette 01 in drive A:
Strike any key when ready
```

Remove the MS-DOS system diskette from drive A and replace it with the backup diskette labeled 01. Then press any key to begin the restore operation. The system displays the following message and lists the files as they are restored.

```
Files were backed up on mm-dd-yyyy ***
*** Restoring files from drive A: ***
Diskette: 01
```

Once all the files from backup diskette 01 have been restored to the fixed disk, the restore operation pauses, and you are prompted to insert backup diskette 02. The system continues to prompt you to insert the backup diskettes in sequence until the restore operation is complete. Then the system displays the MS-DOS command-line prompt.

Unlike BACKUP, RESTORE does not erase files on the target drive. You can perform multiple restores to the same drive without losing any data. If a file is restored more than once, the second and subsequent restore operations write over the first version of the file. Only the most recent version of the file exists when the last restore operation is complete.

If you have been backing up your fixed disk regularly using BACKUP with the Modify option but not the Add option (that is, if you have created multiple sets of backup diskettes), you must run RESTORE once for each set of backup diskettes. Start with the oldest and proceed to the most recent set. After you restore files from the most recent set of backup diskettes, the fixed disk will be fully restored as it existed when you last ran BACKUP.

If you have been backing up your fixed disk using BACKUP with both the Modify and Add options (that is, if you have created one large set of backup diskettes), you need to run RESTORE only once.

3.4 Working with the Fixed Disk

This section offers several suggestions for operating your fixed disk successfully.

3.4.1 Keeping Track of Where You Are

If you are used to a diskette-only system, you may not be familiar with subdirectories. You probably use one diskette for one application program or category of file and other diskettes for other applications or categories. As long as your diskettes are clearly labeled, you usually don't lose track of your files.

Once you have 20 megabytes of information stored on a fixed disk, however, you might become confused about where files are located. To prevent this confusion, you should establish subdirectories for the various categories of files on the fixed disk. (Subdirectories are discussed in Section 5.4 and described in detail in the *MS-DOS 3.1 Reference.*)

Once you have created a number of subdirectories, you can also become confused about where you are in the directory system. You can use the PROMPT command to change the MS-DOS command-line prompt to indicate the subdirectory you are currently in. The following command specifies that the MS-DOS prompt shows the full path ($p) to the current directory, and that the prompt ends with the > symbol ($g):

```
prompt $p$g
```

If you have entered this command, and you are currently in the root directory of drive C, the MS-DOS prompt appears as follows:

```
C:\>
```

If you change to the subdirectory \WORDS, the prompt also changes:

```
C:\WORDS>
```

Change to the subdirectory \WORDS\PRIVATE, and the prompt changes again:

```
C:\WORDS\PRIVATE>
```

Thus the prompt on your screen always tells you where you are.

You can avoid entering the PROMPT command every time you start the system by putting the command in a CONFIG.BAT file. This file is discussed in Section 5.6 and in the *MS-DOS 3.1 Reference.*

3.4.2 Getting There from Wherever You Are

When you invoke an application program or an MS-DOS utility, you must specify the drive and the path to the program or utility, unless it is on the current drive and in the current directory. When you are using a fixed disk with many subdirectories, specifying the full path to a program or utility can become cumbersome.

The PATH command provides a solution to this problem. You can use PATH to give MS-DOS the names of one or more paths to subdirectories to search if a command is not found in the current directory.

The following PATH command, for example, tells MS-DOS to look in the root (top level) directory of drive C if it cannot find the specified command in the current directory:

```
path c:\
```

Suppose you are in the subdirectory \WORDS\PRIVATE and you want to use your word processing program, which is stored in the root directory. If you enter the command to invoke your word processing program directly from the subdirectory \WORDS\PRIVATE, you will receive the error message "Bad command or file name." If you first execute the PATH command shown above, however, MS-DOS will search for and find the program in the root directory after failing to find it in the current directory.

You can invoke any program, command, or batch file located in the root directory from any subdirectory after entering the preceding PATH command. Thus you can organize all your files into logical subdirectories, and still access programs and utilities easily.

You can use the PATH command to specify more than one path for MS-DOS to search. Use a semicolon (;) to separate the paths:

```
path c:\;c:\utility;c:\programs
```

MS-DOS first searches the current directory, then searches the paths in the order specified. The preceding command tells MS-DOS to search the root directory of drive C first, then the subdirectory \UTILITY, then the subdirectory \PROGRAMS.

The PATH command is most useful when you include it in your CONFIG.BAT file. Section 5.6 describes CONFIG.BAT.

3.4.3 Cleaning Up Fragmented Files

When you create a file, it is written to consecutive sectors of the diskette or fixed disk (if the disk has enough consecutive sectors free at the time). As you work with a file and modify it, however, the file tends to become fragmented. That is, it occupies blocks of sectors that are not contiguous.

The more non-contiguous blocks of sectors a file occupies, the greater the access time required to read the file. Badly fragmented files also waste storage space. It is a good idea, therefore, to check and correct the fragmentation of files on your fixed disk occasionally.

The CHKDSK command reports the degree of fragmentation of the files in your current directory. Enter

```
chkdsk c:*.*
```

If your fixed disk has no fragmented files, you receive a message listing the amount of memory used and the amount of memory available on the fixed disk, with the message "All specified file(s) are contiguous."

If some of your files are fragmented, for each file you receive a message such as the following:

```
C:\filename
  Contains n non-contiguous blocks.
```

In the message, **filename** is replaced by the name of the file, and **n** is replaced by the number of non-contiguous blocks.

To clean up fragmented files, you must first back up your fixed disk, as described in Section 3.3.1.

Then, when you are logged on to drive C, enter the DEL (delete) command to erase all the files from the fixed disk:

```
del *.*
```

When you enter this command, the system asks you if you are sure you want to erase all the files. Enter Y **only if you are sure you have current backup copies of all the files on your fixed disk.**

It is strongly recommended that you practice successfully backing up and restoring the fixed disk before you attempt this procedure.

Once you have erased all the files from the fixed disk, restore the files using the RESTORE command, as described in Section 3.3.2. The restored files are written to contiguous sectors, thus eliminating file fragmentation.

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The Keyboard

The VPC II keyboard is an industry-standard, advanced-technology computer keyboard. Figure 4-1 shows the VPC II keyboard with the standard American key layout. French, German, Swedish, and United Kingdom keyboard layouts are also available (see Appendix D).

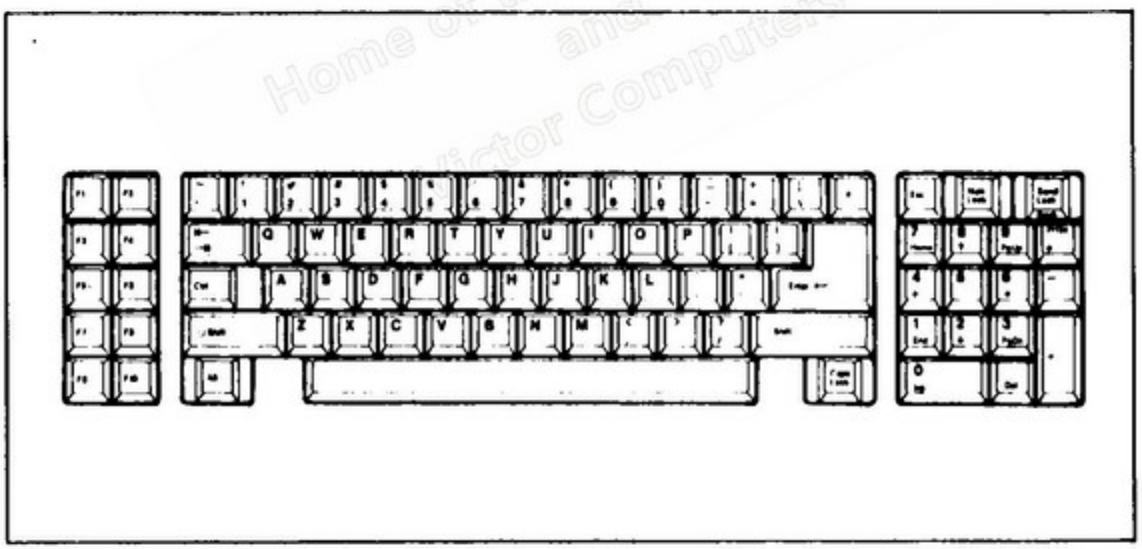

Figure 4-1: VPC II Keyboard

4.1 Adjusting Keyboard Height

You can adjust the height of the keyboard for typing comfort by folding down the legs located on the underside of the keyboard, as shown in Figure 4-2.

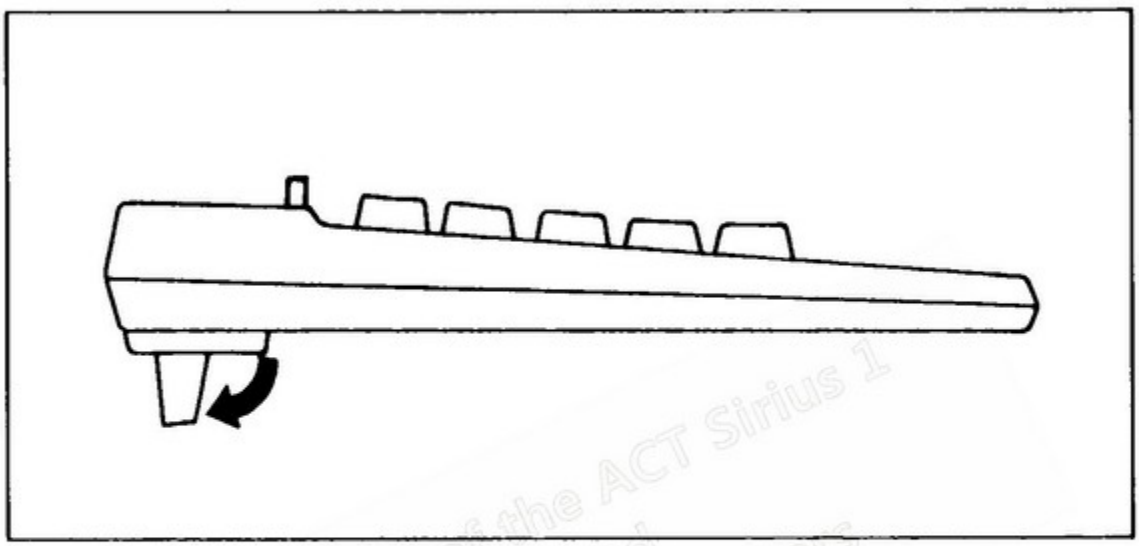

Figure 4-2: Adjusting Keyboard Height

4

4.2 Alphanumeric Keys

The layout of the **alphanumeric keys**—the keys labeled with the letters of the alphabet and the top row of keys labeled with numbers and symbols—is identical to the layout of an ordinary typewriter. These keys are used to enter the symbols with which they are labeled.

As with a typewriter, you hold down either Shift key while pressing an alphanumeric key to produce an uppercase letter, or the top symbol on keys with two labels.

The Caps Lock key on the VPC II keyboard functions somewhat differently than the Caps Lock key of a typewriter. When you activate the Caps Lock key (indicated by the Caps Lock light), all alphabetic characters are entered in uppercase. The number, symbol, and punctuation keys remain unshifted. To enter these characters, you must press the Shift key, even when the Caps Lock key is activated.

If you press the Shift key while the Caps Lock key is activated, and then press an alphabetic key, a lowercase letter is entered.

4.3 Numeric Keypad and Cursor Movement Keys

To the right of the alphanumeric keys on the VPC II keyboard is the numeric keypad, shown in Figure 4-3.

Figure 4-3: Numeric Keypad and Cursor Movement Keys

Most of the numeric keypad keys have two labels—a number and an arrow, word, or abbreviation. The arrow, word, or abbreviation indicates the unshifted, cursor movement function of each key.

The descriptions of the cursor movement key functions in this section are general. The actual functions of the keys may differ depending on the application program you use. Functions specific to a particular application program are usually explained in the documentation for that program.

The Home key moves the cursor to the upper left corner of the display.

The up arrow key (↑) moves the cursor up one line.

The Pg Up key causes the previous screen of the file to be displayed.

The left arrow key (←) moves the cursor one character to the left.

The right arrow key (→) moves the cursor one character to the right.

The End key moves the cursor to the last line of the display.

The down arrow key (↓) moves the cursor down one line.

The Pg Dn key causes the next screen of the file to be displayed.

The Ins key turns character insertion on and off. When character insertion is on, typing a character in the middle of a line causes characters to the right of the inserted character to move one character to the right, and no characters are erased. When character insertion is off, characters typed in the middle of a line write over the characters already at that position.

The Del key deletes the character immediately to the left of the cursor.

The numbers and the decimal point shown on the numeric keypad represent the shifted values of the keypad keys. If you hold down the Shift key and then press a keypad key, you enter the number or decimal point instead of moving the cursor.

The Num Lock key acts as a shift lock for the numeric keypad keys. When the Num Lock key is activated (indicated by the Num Lock light), the numbers on the keypad are entered. Using Shift with the Num Lock key returns the keypad keys to their cursor movement functions.

The alphanumeric number keys (on the top row of the keyboard) and the numeric keypad keys can both be used for numeric data entry. The advantage of using the numeric keypad for extensive numeric data entry is its convenient arrangement.

Note: Although you can enter a 0 (zero) with either the alphanumeric zero key or the numeric keypad zero key, you cannot enter a zero with the letter O key. Likewise, you cannot enter a 1 (one) with the lowercase letter L key.

4.4 Function Keys

To the left of the alphanumeric keys are ten function keys labeled F1 through F10. These keys allow you to enter lengthy commands with a single keystroke.

The actual function assigned to each function key depends on the application program you are running. Consult your application program documentation to find out what the function keys do within each program you use.

At the MS-DOS level, the function keys are used to edit commands you enter on the command line. The *MS-DOS 3.1 Reference* describes command-line editing in detail.

4.5 Special Keys

Certain keys on the VPC II keyboard have special functions; each of the special keys is described in this section.

⇤ ⇥ The Tab key moves the cursor to the next tab stop to the right. When pressed with the Shift key, the Tab key moves the cursor to the next tab stop to the left.

Ctrl The function of the Ctrl (Control) key is software dependent. It is always used in conjunction with another key; pressing Ctrl alone has no effect. Many application programs use Ctrl-key sequences to execute commands.

Alt The function of the Alt (Alternate) key is software dependent. In the BASIC programming language, the Alt key allows you to input BASIC key words without spelling them out. At the MS-DOS level, you can enter special characters not available on the keyboard by holding down the Alt key and entering the decimal code for the desired character, using the numeric keypad keys.

← The Backspace key moves the cursor one character to the left. At the MS-DOS level, the Backspace key also writes over any character at the new cursor position. In some application programs, the Backspace key moves the cursor without erasing characters.

Enter ↵ The Enter key works like the carriage return on a typewriter—it moves the cursor down one line and to the left edge of the screen. At the MS-DOS level, pressing the Enter key at the end of a command line sends the command to the operating system to be executed.

Esc The function of the Esc (Escape) key is software dependent. At the MS-DOS level, the Esc key cancels the current command line and displays the command-line prompt. In many application programs, the Esc key is used to cancel a procedure or move from one menu to another.

Scroll Lock Break

If you press the Scroll Lock key while holding the Ctrl key down, you break (stop) the operation in progress. If the application program you are using supports the scroll function, you can press the Scroll Lock key to scroll the information on the screen. Press the key again to stop the scrolling.

PrtSc *

The PrtSc (Print Screen) key works in conjunction with either the Shift or the Ctrl key. If you hold down the Shift key and press the PrtSc key, all data currently displayed on the screen is sent to the printer. If you hold down the Ctrl key and press the PrtSc key, all subsequent keyboard input is sent (echoed) to the printer as well as to the screen. When you press Ctrl-PrtSc again, input is no longer echoed to the printer.

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Overview of MS-DOS

Every computer has an operating system, which is a set of programs that handle communications between you and the computer's hardware and between other programs and the computer's hardware. A computer cannot perform any useful work until its operating system is loaded into memory.

The operating system shipped with your VPC II is MS-DOS 3.1, one of the most popular and powerful microcomputer operating systems available. Most of the work that MS-DOS performs for you is invisible and requires no effort on your part. There are, however, a few things you need to know about MS-DOS to get started. This chapter gives a brief introduction to the MS-DOS operating system. MS-DOS is fully documented in the *MS-DOS 3.1 Reference.*

5.1 MS-DOS Files

MS-DOS stores all data in **files**. A document you create with a word processing program is a file. Application programs consist of one or more files. MS-DOS itself is made up of various files. Any data on a diskette or on the fixed disk is stored in a file. MS-DOS keeps track of all the files on a diskette or fixed disk and records their locations.

A file can be any length from one character to the maximum space available on the diskette or fixed disk. A file can consist of ordinary characters that you can display on the screen and read, or it can consist of machine-readable data that is uninterpretable to you.

5.2 File-Naming Rules and Conventions

MS-DOS and any application programs that you use consist of files that have already been named. You can display a list of all the files on a diskette or fixed disk by using the DIR command, which is explained later in this chapter. (DIR does not list the two MS-DOS hidden files.)

When you create your own files, you must name them. The MS-DOS rules for naming files are given in this section.

A **file specification** consists of a filename and an optional filename extension. The **filename** is a name of your choice and can be from 1 to 8 characters long. You can use all the keyboard characters in a filename except the following:

(space) . " / \ [ ] : | < > + = ; ,

You can enter the filename in either uppercase or lowercase. MS-DOS automatically translates lowercase characters into uppercase, so filenames are always displayed in uppercase. Here are some examples of valid filenames:

TEXT
MYNOTES
NEWPROG
DATAFILE

These filenames are **not** valid:

11/25	Contains illegal / character
MEMO JAN	Contains a space
LETTERTOSARA	Has more than 8 characters

An MS-DOS **filename extension** begins with a period (.) and is followed by up to 3 characters. For files that you create, the filename extension is optional; you do not have to supply one. The valid characters for a filename extension are the same as those for a filename.

Filename extensions are generally used to specify the category to which a file belongs. For example, you can use the extension .TXT for all text files or .DAT for all data files. Here are some filenames containing extensions:

NEWSLET.TXT
MYPROG.BAS
INCOME.DAT

You can use any filename extension you want for files you create, with the following exceptions:

- Some application programs require that you use a particular filename extension for any file that will be processed by the application program. A text formatting program, for example, might require that files to be formatted have the extension .MSS. Similarly, a BASIC compiler program might require that files to be compiled have the extension .BAS.
- Two filename extensions are reserved for machine-executable program files: .COM (command) and .EXE (executable). You should not create files with these extensions using an editing or word processing program. .COM files and .EXE files are created by compiler programs and not by the user.

  The programs and commands that you can execute directly from the MS-DOS command-line prompt are stored in .COM or .EXE files. Whenever you type a command to invoke an application program, you are entering the name of a .COM or .EXE file.
- The .BAT filename extension is reserved for batch files. Batch files contain commands that can be executed in sequence by the operating system. You can use a .BAT file to invoke an application program directly from the MS-DOS command-line prompt. For more information about batch files, see Section 5.6.

MS-DOS recognizes two special "wildcard" characters in file specifications: the question mark (?) and the asterisk (*). You cannot use these characters in filenames, but you can use them to refer to files.

You can use a question mark (?) to stand for any single character in a file specification. Suppose your current directory contains the two files MYPROG.BAS and MYPROG.BAK. If you use the DIR command to list all the files that match the file specification MYPROG.BA?, both MYPROG.BAS and MYPROG.BAK will be included in the list.

You can use more than one ? in a file specification. Each question mark in a file specification stands for any single character. The file specification ??PROG.BA? matches all these file specifications:

MYPROG.BAS	MYPROG.BAK
HIPROG.BAS	IOPROG.BAS
NOPROG.BAK	LOPROG.BAP

The asterisk (*) can stand for any number of characters in a file specification. *.TXT matches **all** files with a .TXT filename extension. MYPROG.* matches any file with a filename of MYPROG, no matter what its extension. F*.* matches file specifications that begin with F. The file specification *.* matches **all** files.

5.3 Specifying a Drive

When you specify a file, you have to tell MS-DOS where to look for it. If you don't specify a drive with the filename, MS-DOS looks for the file on the default drive (the drive identified by the letter currently in the MS-DOS command-line prompt).

You can change the default drive by entering a new drive specification from the MS-DOS command-line prompt. For example, if you are currently logged on to drive A, you can log on to drive C by entering a C and a colon (:), as follows:

```
A>c:
```

The command-line prompt changes to show the new default drive:

```
C>
```

You can also specify the drive as part of the file specification. That is, without changing the default drive, you can tell MS-DOS to look on another drive for the file you want. Suppose you are logged on to drive C and you want to invoke your word processing program, which is on a diskette in drive A. If the command that invokes the word processing program is WP, you can invoke it from drive C like this:

```
C>a:wp
```


5.4 Subdirectories and Pathnames

All the files you create on a particular diskette or fixed disk are located in the same directory, unless you specify otherwise. The **directory** is the list MS-DOS creates to keep track of the files on the diskette or fixed disk.

When you are using only diskettes, you can keep all the files on one diskette in a single directory—you can organize your files by placing different kinds of files on separate diskettes.

When you use a fixed disk, however, it is inefficient to keep all your files in the same directory. The list of files in the directory becomes so extensive that the directory is confusing to look at, and the large number of files slows MS-DOS down when it is searching for a file.

Using subdirectories can solve this problem. A **subdirectory** is a file that is located in another directory. When you are logged in to a directory, subdirectories of that directory appear to you and to MS-DOS as single files. When you log in to one of those subdirectories, however, you have access to all the files stored there.

The top-level or main directory of a diskette or fixed disk is called the **root directory**. A large number of subdirectories can reside in the root directory, and each of those subdirectories can contain additional subdirectories (up to 1024 subdirectories for a 20-MB fixed disk). The directory one level above a subdirectory is its **parent directory**.

When diagrammed, this hierarchy of the root directory and its subdirectories looks something like an upside-down tree. Therefore, such directory systems are often referred to as tree-structured. Figure 5-1 shows a tree-structured or hierarchical arrangement of directories.

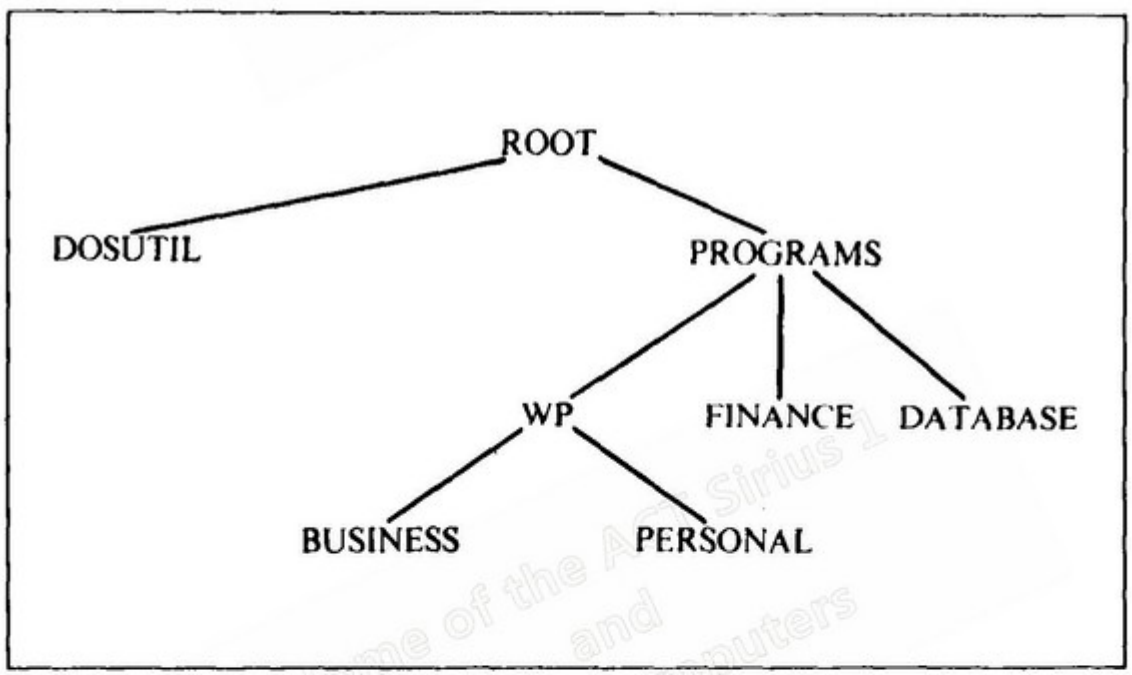

Figure 5-1: Tree-Structured Directories

In the directory structure shown in Figure 5-1, WP is the parent directory of the two subdirectories, BUSINESS and PERSONAL. WP is in turn a subdirectory of the parent directory PROGRAMS, which is a subdirectory of the root directory. Subdirectory names, like other filenames, are limited to eight characters.

Once you create subdirectories to organize your files (see the MKDIR command in Section 5.7.10), you must specify a **path** through the directory structure for MS-DOS to search for the file you want to access. You can specify a path in two ways:

- No matter what directory you are currently in, you can specify the path starting at the root directory and leading to the file. Use this method when there is no direct downward path from the current directory to the file you want to access.

  For example, if you are in the subdirectory FINANCE shown in Figure 5-1, and you want to access the utility DISKCOPY.COM in the subdirectory DOSUTIL, you must specify the path from the root directory to the file. The path from the root directory always begins with a backslash (\). Thus, to specify the DISKCOPY.COM utility, enter

  ```
  \dosutil\diskcopy
  ```

  The DISKCOPY command is separated from the directory name by a backslash.

- If there is a direct downward path from the directory you are in to the file you want to access, you can specify only the part of the path between your current directory and the file you want to access.

  For example, if you are in subdirectory PROGRAMS and you want to access the file REPORT.TXT in subdirectory BUSINESS, the correct path specification is

  ```
  wp\business\report.txt
  ```

You can specify a path that leads to a different drive. To do so, put the drive specifier before the path. For example, if you are logged on to drive A, you can access the file SMITH.LET in a subdirectory on drive C as follows:

```
c:\sub1\letters\smith.let
```

5.5 Creating a Virtual Disk Drive

Your MS-DOS system diskette contains a file called VDISK.SYS that allows you to create a virtual disk drive. A **virtual disk**, also called a RAM disk, exists only in your computer's memory, but acts like (emulates) a floppy disk drive or fixed disk drive.

The advantage of a virtual disk is that it is very fast. Accessing physical disk drives, even fixed disk drives, is one of the slowest operations your computer performs. When you run application programs that require frequent disk access, the time lost in accessing a physical disk can become significant. If you run these programs from a virtual disk, "disk" accesses take place only in memory and are as fast as other internal memory operations.

The disadvantage of a virtual disk is that its contents are lost whenever the computer's power supply is interrupted. Therefore, if you use a virtual disk to store data files, you must copy the files to a physical disk before you turn your computer off. Even so, you risk losing data because of an accidental power interruption.

You may want to use a virtual disk only for programs and data that do not change while you use the computer. For example, you can copy your word processing program from a physical disk to a virtual disk, and keep the files created with the program on a physical disk. Then you will lose only the data file you are currently using if a power failure destroys the contents of the virtual disk.

The following sections describe how to create a virtual disk drive.

5.5.1 Creating a CONFIG.SYS File

The first step in setting up a virtual disk drive is to create a CONFIG.SYS file that contains the device driver VDISK.SYS. A **device driver** is software that tells MS-DOS how to communicate with a specific device that it does not already know about. For VDISK.SYS this device is the virtual disk.

CONFIG.SYS is a special file that lists device drivers and other optional attributes of your system's configuration. Every time you start MS-DOS, it looks for a CONFIG.SYS file. If MS-DOS does not find the file, it assumes a default system configuration. (CONFIG.SYS is fully described in the *MS-DOS 3.1 Reference.*)

Note: The CONFIG.SYS file and the CONFIG.BAT file are not the same. Device drivers, such as VDISK.SYS, must be invoked from the CONFIG.SYS file.

You can create a CONFIG.SYS file with the MS-DOS line editor EDLIN, with your word processing program, or with the MS-DOS COPY command.

To use COPY to create CONFIG.SYS on your system diskette, insert the diskette in drive A and log on to drive A. If you want to create CONFIG.SYS on the MS-DOS partition of the fixed disk, log on to drive C. Then follow these steps:

1. At the MS-DOS prompt, enter

   copy con config.sys

   The COPY CON command tells the operating system to copy what you type to the file CONFIG.SYS.

2. Type the commands you want CONFIG.SYS to contain, pressing Enter at the end of each line. The commands and options you can use for VDISK.SYS are explained in the next section.

3. When you finish entering commands, press the F6 key and then press Enter.

You have now created a CONFIG.SYS file. The command(s) contained in the file will take effect the next time you start the operating system.

5.5.2 Adding VDISK.SYS to the CONFIG.SYS File

The next step is to add the VDISK.SYS device driver to the CONFIG.SYS file. This section describes the syntax you use in the VDISK.SYS command line. Optional parts of the command line are shown in square brackets ([ ]).

device = [d:][path]vdisk.sys[b][s][d]

[d:][path] specifies the drive and the directory path to the VDISK.SYS file. If VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS, you do not need to specify the drive and path.

[b] specifies the size of the virtual disk in kilobytes (KB). This value can range from 1 to the total amount of memory available on your system, minus 64 KB. If you do not specify a value, MS-DOS supplies a default value of 64. If you specify a value less than 1 KB or more than total memory minus 64 KB, MS-DOS also uses the default value of 64. If you want to use the default value for **b**, but want to specify a value for **s** or **d**, enter a comma (,) in place of **b**:

device = [d:][path]vdisk.sys , [s][d]

[s] specifies the virtual disk sector size in bytes. The possible values are 128, 256, and 512. If you do not supply one of these values, or if you supply a different value, MS-DOS assigns a default value of 128. You should normally specify a sector size of 512. This value ensures maximum compatibility between the virtual disk and programs that expect to access 512-byte sectors on physical disks. If you know that compatibility is not a problem, and you expect to store small files on the virtual disk, you may want to specify a smaller sector size to reduce wasted space.

If you want to use the default value for **s**, but want to specify a value for **d**, enter a comma (,) in place of **s**:

device = [d:][path]vdisk.sys[b] , [d]

[d] specifies the number of directory entries (that is, files) the virtual disk can contain. Each directory entry requires 32 bytes of memory, so you waste memory if you specify many more entries than you are likely to need. The range of values is 2 through 512. Although you can specify any value within this range, the system adjusts the value upward so that the number of directory entries multiplied by 32 bytes equals an even multiple of the sector size. For example:

- A 128-byte sector holds four directory entries ($4 \times 32 = 128$). If your sector size is 128, the number of directory entries is always a multiple of 4. If you specify a value of 3, the system uses 4; if you specify 5, the system uses 8, and so on.
- A 256-byte sector can hold eight directory entries ($8 \times 32 = 256$). If your sector size is 256, the number of directory entries is always a multiple of 8.
- For a 512-byte sector, the number of directory entries is always a multiple of 16 ($16 \times 32 = 512$).

If you do not specify the number of directory entries, the system supplies the default value 64. If you specify a number of directory entries too large for the specified size of the virtual disk, the virtual disk is not installed, and the system displays the following message:

```
*** : Virtual Disk Not Allocated.
```

5.5.3 Examples of the VDISK.SYS Command

The examples in this section illustrate VDISK.SYS commands you can use in the CONFIG.SYS file.

device = vdisk.sys

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk using default specifications: virtual disk size = 64 KB, sector size = 128, and number of directory entries = 64.

device = c:\mydir\vdisk.sys

This command specifies that VDISK.SYS is on drive C in directory MYDIR. The command creates a virtual disk using default specifications: virtual disk size = 64 KB, sector size = 128, and number of directory entries = 64.

device = vdisk.sys 100

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk 100 KB in size, with default 128-byte sectors, and the default 64 directory entries.

device = vdisk.sys 150 256

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk 150 KB in size, with 256-byte sectors, and the default 64 directory entries.

device = vdisk.sys 200 512 32

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk of 200 KB, with 512-byte sectors, and 32 directory entries.

device = vdisk.sys , 512 48

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk of the default size (64 KB), with 512-byte sectors, and 48 directory entries.

device = vdisk.sys , , 16

This command specifies that VDISK.SYS is on the same drive and in the same directory as CONFIG.SYS. The command creates a virtual disk of the default size (64 KB), with sectors of the default size (128 bytes), and 16 directory entries.

device = c:\mydir\vdisk.sys 300 256 24

This command specifies that VDISK.SYS is on drive C in directory MYDIR. The command creates a virtual disk 300 KB in size, with 256-byte sectors, and 24 directory entries.

5.5.4 Starting the Virtual Disk

Once you have created a CONFIG.SYS file that contains the VDISK.SYS command on the diskette or fixed disk partition from which you load the operating system, the virtual disk is created every time you load MS-DOS.

When you load MS-DOS, the screen displays the following message:

```
VDISK Version X.X Virtual Disk x:

     Buffer Size = n1 KB
     Sector Size = n2  B
     Directory Entries = n3
```


x specifies the drive designator of the virtual disk.

n1 specifies the size of the virtual disk in kilobytes.

n2 specifies the size of the virtual disk sectors.

n3 specifies the number of directory entries.

5.6 The CONFIG.BAT File

The CONFIG.BAT file is a special batch file. If CONFIG.BAT is present on the diskette or fixed disk partition from which you load MS-DOS, all the commands in the CONFIG.BAT file are executed every time you load MS-DOS. Using a CONFIG.BAT file is a convenient way to invoke any commands that you want to execute when you start the system. These commands can include the PROMPT and PATH commands discussed in Chapter 3.

CONFIG.BAT is a special VICTOR extension to MS-DOS. The CONFIG.BAT file is identical to the AUTOEXEC.BAT file provided with MS-DOS and explained in the *MS-DOS 3.1 Reference*, except that the commands contained in CONFIG.BAT are executed **before** those in AUTOEXEC.BAT, if both files are present. CONFIG.BAT allows you to create your own automatically executed batch files, even when an application program has pre-empted the AUTOEXEC.BAT file.

You can create a CONFIG.BAT file with the MS-DOS line editor EDLIN, with your word processing program, or with the COPY command. The file consists of a series of command lines typed exactly as you would enter them in response to the MS-DOS command-line prompt. (You do not include the command-line prompt itself in the CONFIG.BAT file.)

Suppose you want to create a CONFIG.BAT file containing the following PROMPT and PATH commands:

```
prompt $p$g

path c:\dosutil;c:\sub1
```

This PROMPT command specifies that the MS-DOS command-line prompt includes the full path to the current directory and that it ends with the > symbol. This PATH command specifies that MS-DOS will look for files first in the current directory, then in the subdirectory \DOSUTIL on drive C, then in the subdirectory \SUB1 on drive C.

You can create the CONFIG.BAT file with the COPY command as follows:

1. In response to the MS-DOS command-line prompt, enter

   copy con config.bat

2. Press Enter. Type the PROMPT command:

   prompt pg

   Press Enter.

3. Type the PATH command:

   path c:\dosutil;c:\sub1

   Press Enter.

4. Press Function key F6 and Enter.

MS-DOS copies the commands you entered into the CONFIG.BAT file. The next time you load the operating system from the diskette or fixed disk partition containing CONFIG.BAT, the commands will automatically be executed.

5.7 MS-DOS Commands

This section briefly describes several frequently used MS-DOS commands. These commands, as well as the many other commands available in MS-DOS, are fully documented in the *MS-DOS 3.1 Reference.* MS-DOS commands are either internal or external.

Internal commands are available to you whenever the operating system is in memory. You do not need to have the MS-DOS diskette in drive A or log in to a subdirectory containing the MS-DOS files to access internal commands. The following internal commands are described in this section:

CHDIR	ERASE
CLS	HISTORY
COPY	MKDIR
DEL	RENAME
DIR	TYPE

External commands are located in separate files on the MS-DOS diskette. You can copy these files to other diskettes or to any subdirectory of the fixed disk, but you must always have access to the appropriate command file to execute an external command. The external commands DISKCOPY and FORMAT are described in this section.

5.7.1 CHDIR (Change Directory)

Use the CHDIR command to change the current directory. You can shorten CHDIR to CD; the two forms are equivalent.

Assuming you are in the root directory of the structure shown in Figure 5-1, this CHDIR command changes the current directory from the root directory to the subdirectory WP:

```
cd programs\wp
```

If you are already in the subdirectory PROGRAMS, you can change to WP with the following command:

```
cd wp
```

The following CHDIR command makes the parent directory of the current directory the new current directory. That is, you change from the current directory level to the preceding level.

```
cd ..
```

5.7.2 CLS (Clear Screen)

The CLS command clears the screen and moves the MS-DOS command-line prompt and the cursor to the upper left corner of the screen. To clear the screen, enter

```
cls
```

5.7.3 COPY (Copy Files)

Use the COPY command to copy files from one place to another. The basic form of the COPY command is as follows:

```
copy [source] [target]
```

The **source** is the file you are copying from. The **target** is the file you are copying to. The full specification for both the source and the target includes the drive, the path, and the filename and extension. You can omit any part of either specification that is the current default.

If you copy the file to another diskette or subdirectory, you can give the file the same name, or you can change the name. If you want to copy the file to the same diskette or subdirectory, however, you must change the name.

If you want to make a copy of the file PROGRAM.TXT, which is located in the current directory, and you want to name the copy WP.TXT and keep it in the current directory, use this command:

```
copy program.txt wp.txt
```

If you want to copy PROGRAM.TXT, using the same name, from drive A to drive C, specify the target drive (specifying the target filename is optional):

```
copy program.txt c:
```

You can use the wildcard characters, ? and *, with the COPY command to copy more than one file at a time. The following command copies **all** files from the current directory to drive C:

```
copy *.* c:
```

The copies created by this command have the same filenames and extensions as the original files.

You can also copy files from one directory to another. The following command copies the file PROGRAM.TXT from the current directory to subdirectory WP of directory PROGRAMS:

```
copy program.txt \programs\wp
```

5.7.4 DEL (Delete Files)

Use the DEL command to delete files. You can specify a specific file to delete, or you can use wildcard characters to specify a group of files.

The following DEL command deletes the single file PROGRAM.TXT from the current directory of the default drive:

```
del program.txt
```


This command deletes every file with extension .BAK from drive A:

```
del a:*.bak
```

The following command deletes **every** file from the current directory of the default drive:

```
del *.*
```

MS-DOS does not let you delete every file without first displaying the following prompt:

```
Are you sure (Y/N)?
```

This message is displayed to protect you from accidentally deleting files you do not want to lose. If you decide not to execute the command you entered, answer N (no) in response to the prompt.

5.7.5 DIR (Display Directory)

Use the DIR command to list all the files and subdirectories in the current or specified directory. If you enter the DIR command alone, MS-DOS displays a full listing of the files in the current directory, including the following information for each file:

- The filename and filename extension
- The number of bytes in the file
- The date and time the file was created or last written to

The directory display lists subdirectory names followed by the <DIR> attribute. The display also tells you how many files are in the directory and how many unused bytes remain on the diskette or fixed disk.

A large directory often contains more entries than will fit on the screen at once; the display scrolls past, and you see only the last screenful of information. The DIR command includes two options for displaying a long directory: /P and /W.

DIR /P causes the listing to pause when the screen is full. You are prompted to press any key when you are ready to continue. The list scrolls until the next screenful of files is displayed, then pauses again. Continue this procedure until you have viewed the entire directory.

DIR /W displays the directory in wide-screen format. When you specify /W, only the filenames and extensions are listed, in five columns across the screen. The date and time are not displayed. The wide-screen format gives the number of files in the directory and the number of unused bytes available.

You can use the DIR command to list the files in directories other than the current one. If the root directory of drive A is the current directory, and you want to list the files in the root directory of drive C, enter this DIR command:

```
dir c:
```

To list the files in the subdirectory PROGRAMS\WP on drive C, enter

```
dir c:\programs\wp
```

You can also use the DIR command to list a category of files. Use the wildcard characters ? and * to specify the files you want listed.

To display all files in the current directory with the file extension .EXE, for example, enter the following command:

```
dir *.exe
```

To list all files with names beginning with the letter F, enter

```
dir f*.*
```


5.7.6 DISKCOPY (Copy Diskettes)

Use DISKCOPY to copy the entire contents of one diskette to another diskette. The DISKCOPY command differs from the COPY command in three ways:

- DISKCOPY copies the two hidden MS-DOS files, MSDOS.SYS and IO.SYS, to the target diskette if they are present on the source diskette. COPY cannot copy hidden files.
- DISKCOPY formats the target diskette during the copy operation if the diskette is not already formatted. COPY requires that the target diskette is formatted.
- DISKCOPY creates an exact duplicate of the source diskette. If files are fragmented on the source diskette, they will remain fragmented on the target diskette. The command COPY *.* copies all the data from one diskette to another, but does not duplicate the pattern in which the data is stored on the diskette. Therefore, use COPY *.* rather than DISKCOPY to copy diskettes that contain fragmented files.

If you have one floppy disk drive, enter the DISKCOPY command alone:

```
diskcopy
```

You are prompted to insert the source and target diskettes alternately in drive A as the copy operation proceeds.

If you have a dual-floppy disk system, you can speed up the copying process by copying from a diskette in drive A to a diskette in drive B (or vice versa). To copy from drive A to drive B, enter the following DISKCOPY command:

```
diskcopy a: b:
```

With either form of DISKCOPY, the following prompt is displayed when the copy operation is complete:

```
Copy another? (Y/N)
```

To start another copy, press Y (yes). To return to the MS-DOS command level, insert the MS-DOS diskette in drive A, and press N (no).

5.7.7 ERASE (Erase Files)

The ERASE command erases or deletes files in exactly the same way as the DEL command; the two commands are interchangeable.

5.7.8 FORMAT (Format Diskettes)

Use the FORMAT command to prepare a diskette to receive data. You can also format the fixed disk; to do so, refer to Chapter 3. The basic form of the FORMAT command is

format x:

x: specifies the drive in which the diskette is formatted. For a system with one floppy disk drive, the drive is A.

CAUTION: If you enter the FORMAT command without specifying a drive, the program formats the default drive. If you are logged on to fixed disk drive C, and you enter FORMAT without specifying a drive, the program reformats the entire fixed disk, thus **destroying the data** stored there. To be safe, always specify a drive with FORMAT, even when you intend to format the default drive.

Formatting a diskette destroys any data already stored on the diskette. Therefore, format only new, blank diskettes or diskettes that you are sure contain no useful data.

To format a diskette in a system with one floppy disk drive, insert your MS-DOS diskette in drive A. Enter

format a:

MS-DOS prompts you to insert the diskette to be formatted into drive A and press Enter again. As the diskette is formatted, this message is displayed:

```
Formatting...
```

When the format operation is complete, MS-DOS displays the number of bytes available on the diskette with this message:

```
Format another (Y/N)?
```

To format another diskette, press Y (yes). To return to the MS-DOS command level, insert your MS-DOS diskette in drive A, and press N (no).

The FORMAT command includes many options, which are fully explained in the *MS-DOS 3.1 Reference*. This section describes the /S option.

/S specifies that after the diskette is formatted, the two hidden system files MSDOS.SYS and IO.SYS and the COMMAND.COM file are all copied to the diskette. This diskette is now bootable—that is, you can use it to load the operating system. To use the /S option, enter this command:

```
format a: /s
```


5.7.9 HISTORY (List Commands)

The HISTORY command is a VICTOR extension to the MS-DOS operating system. HISTORY automatically stores the commands you enter from the MS-DOS system level (that is, commands entered while the MS-DOS command-line prompt is displayed). HISTORY stores a total of 256 characters; the exact number of commands stored depends on the number of characters in each command.

You can shorten the HISTORY command to HI. To list all the stored commands, enter

```
hi
```

MS-DOS displays a list similar to the following:

```
1.  dir
2.  path c:\;c:\utility;c:\programs
3.  del *.bak
4.  chkdsk a:*.*
```

The commands displayed by HISTORY are numbered. The most recent command has the lowest number and appears first on the list. The HISTORY command itself is not displayed.

If the list is longer than one screen, the message "Strike a key when ready" appears. Press any key to see the next screen of commands. Press Ctrl-C to stop displaying the list.

5

A list of the commands you enter is useful if you don't get the results you expect. HISTORY gives you a record of exactly what you did and can indicate a typing error or an incorrect command, filename, or drive specifier.

After you use HISTORY to display a numbered list of commands, you can re-enter commands from the list without retyping them. Enter the HISTORY command and the number of the command you want to execute, and press Enter. Then press function key F3 and Enter.

To re-execute command number 2 from the preceding list, for example, type

```
hi 2
```

and press Enter. Then press F3 and Enter to re-execute the PATH command that is number 2 on the list.

You can also edit command lines using the HISTORY display. Entering HISTORY and the number of the command line you want to edit puts the command in a command-line template. You can then edit the command line as described in the *MS-DOS 3.1 Reference.*

5.7.10 MKDIR (Make Directory)

Use the MKDIR command to create subdirectories. The basic format of the MKDIR command is shown below. You can shorten MKDIR to MD; the following two commands are equivalent:

```
mkdir [d:]path

md [d:]path
```

d: specifies the drive on which you want to create the subdirectory. If you are creating a subdirectory on the current drive, you do not need to specify the drive.

path can be either the full path from the root directory to the directory you are creating, or the path from the current subdirectory to the new subdirectory you are creating.

If, for example, you are in the root directory of drive C, and you want to create the subdirectory PROGRAMS, enter this command:

```
md programs
```

Suppose you are in the subdirectory PROGRAMS, and you want to create a new subdirectory, WP, below PROGRAMS. You can specify the full path from the root directory, as follows:

```
md \programs\wp
```

Or you can specify only the path from PROGRAMS to the new subdirectory:

```
md wp
```

When the path does not start in the root directory, you do not have to begin the path with the backslash (\).

5.7.11 RENAME (Rename Files)

Use the RENAME command to rename files. The format of the RENAME command is given below. You can shorten RENAME to REN; the following two forms of the command are equivalent:

```
rename oldfilename newfilename

ren oldfilename newfilename
```

You cannot rename a file with a name that already exists on the same diskette or subdirectory.

If the file to be renamed is not in the current directory of the default drive, you must specify the drive and path to the file.

Suppose you are logged on to drive A, and you want to rename the file WORD.COM in subdirectory PROGRAMS\WP on drive C. If the new name is WF.COM, enter the following command:


```
ren c:\programs\wp\word.com wf.com
```

If you want to change a file's extension without changing its name, you can save keystrokes by using the * wildcard character in the RENAME command. Both of the following commands change the filename ACCOUNTS.DAT to ACCOUNTS.BAK:

```
ren accounts.dat accounts.bak

ren accounts.dat *.bak
```

Or you can use the * to keep the same filename extension but change the filename. Both of these commands rename the file TRASH.TXT to GREATART.TXT:

```
ren trash.txt greatart.txt

ren trash.txt greatart.*
```

5.7.12 TYPE (Display Files)

Use the TYPE command to display the contents of a file on the screen. Although you can use TYPE with any type of file, program files (.EXE and .COM files) produce uninterpretable displays because these files contain non-alphanumeric characters that cannot be displayed.

To display the contents of the file MEMO.TXT on the screen, enter this command:

```
type memo.txt
```

The file will scroll rapidly up the screen. To stop the file from scrolling so that you can read it, press Ctrl-S. To resume scrolling, press Ctrl-S again.

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Internal Option Installation

Many internal options are available for the VPC II. In general, option cards designed for the IBM PC/XT also work in the VPC II. You should check with the vendor of any option card, however, before buying it.

This appendix provides general instructions for installing options of various types.

A.1 Removing the System Unit Cover

Before you can install an internal option in the VPC II, first remove the cover from the system unit. Follow these steps:

1. Unplug the system unit.
2. If a display unit or any other external device is resting on top of the system unit, remove it and set it aside. It is not necessary to disconnect external option cables from the back of the VPC II system unit before you remove the cover.
3. Unplug the keyboard from the right side of the system unit.
4. Remove the four cover screws from the sides of the system unit, as shown in Figure A-1.
5. Slide the cover toward the rear of the system unit, as shown in Figure A-1, and then lift and remove it.

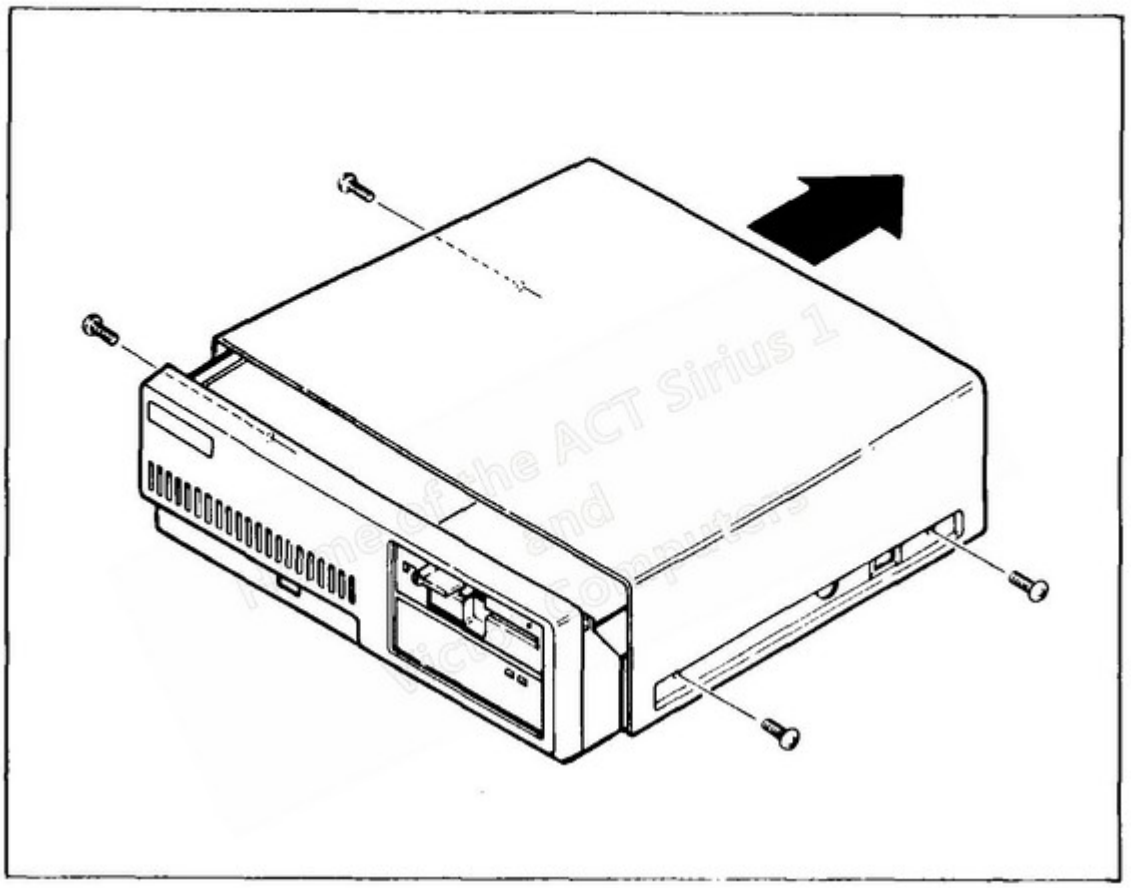


Figure A-1: Removing the Cover from the System Unit

A.2 Installing an 8087 Coprocessor

The socket for an 8087 coprocessor is located on the VPC II's main circuit board, next to the 8086 processor. The socket is approximately midway between the front and the back of the system unit, in line with expansion slot 5 (see Figure A-2).

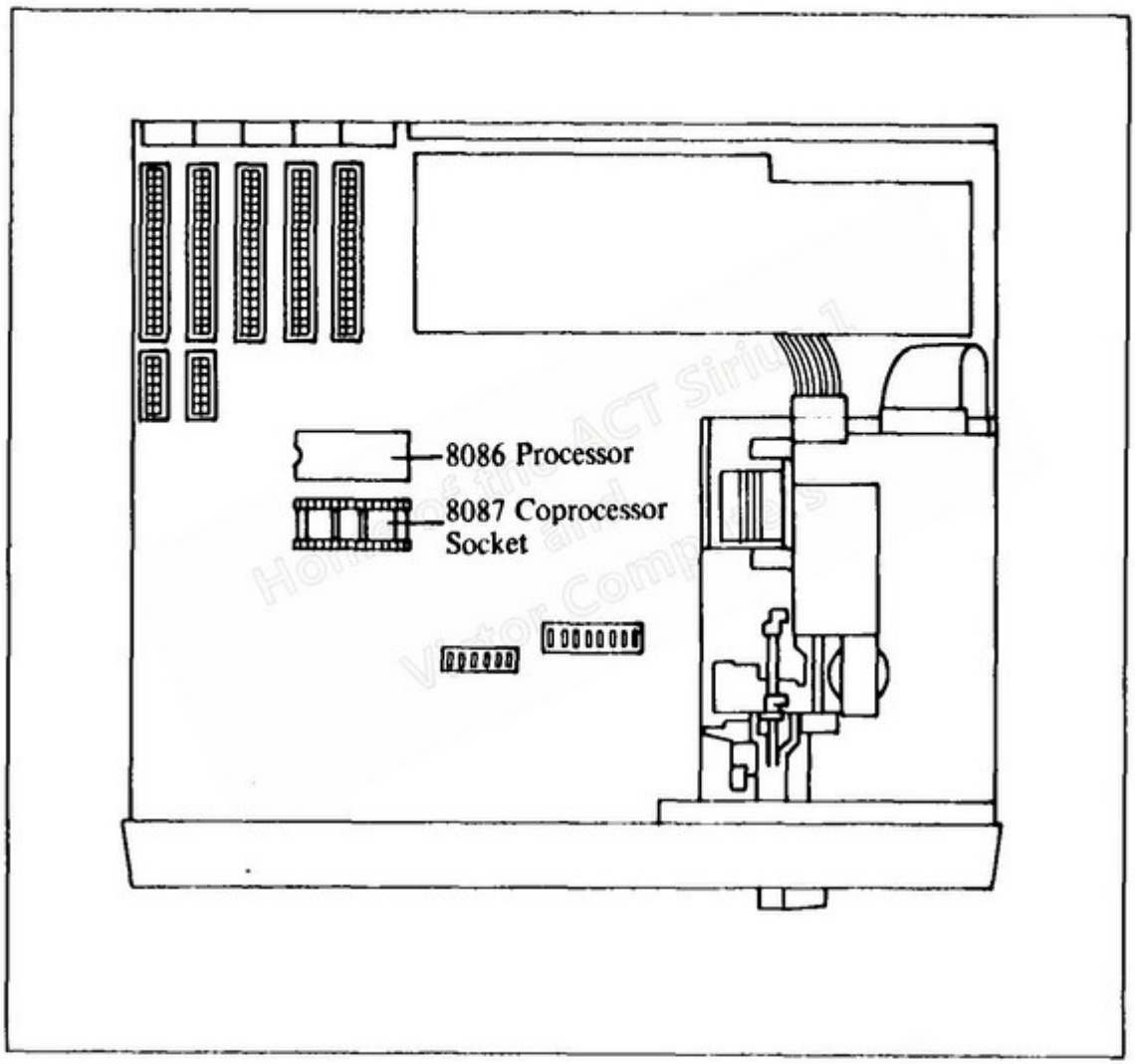


Figure A-2: Location of 8086 Processor and 8087 Socket

if you have an option card installed in expansion slot 5, you must temporarily remove the card to gain access to the 8087 socket.

To install an 8087 coprocessor you must insert the 8087 into the socket provided. It is essential that the 8087 is correctly positioned in the socket. The small notch in one end of the 8087 must face the **left side** of the system unit as you are facing the system unit.

When you insert the 8087 into the socket, make sure that each pin is aligned with the hole that will receive it. Then push the 8087 gently into the socket, using a slight rocking motion if necessary. Do not force the 8087 into place, because you can bend pins and damage the coprocessor.

After you install the 8087 coprocessor and any other internal options you want to install at the same time, replace the system unit cover by reversing the steps listed in Section A.1.

A.3 Installing Option Cards in the Expansion Slots

The VPC II has five internal expansion slots, shown in Figure A-3.

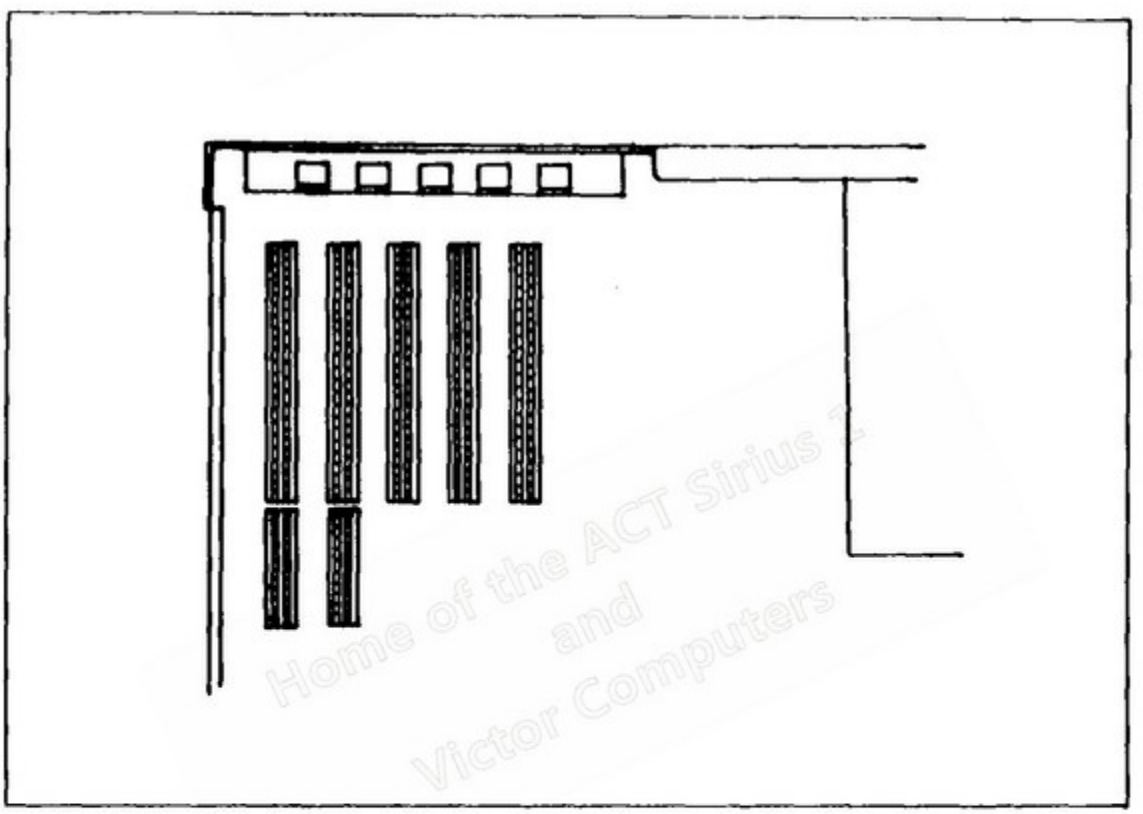


Figure A-3: Internal Expansion Slots

Slots 1 and 2 are designed for 16-bit option cards; the other three slots are designed for 8-bit option cards. An 8-bit option card functions correctly when installed in a 16-bit slot, but you cannot install a 16-bit card in an 8-bit slot.

A.3.1 Slot Selection

The slot you choose for the installation of a particular option card is essentially up to you.

The video display adapter card is usually installed in slot 1.

A fixed disk must be connected to its controller card by a cable. Therefore you should install the fixed disk controller card in slot 5, which is the slot nearest the fixed disk. (If your VPC II is factory-equipped with a fixed disk, the controller card is already installed.)

Ventilation should be also considered when you select expansion slots. If you plan to use only a few of the expansion slots, space the option cards as evenly as possible to allow maximum air flow between them for cooling.

A.3.2 Option Card Appearance

Figure A-4 shows two option cards—an 8-bit card and a 16-bit card. The 8-bit card has one tab extending from the bottom edge, and the 16-bit card has two tabs. When you install the cards, you insert these tabs into the expansion slots on the system unit's main circuit board.

At one end of each card is a mounting bracket used to secure the option card to the rear panel of the system unit.

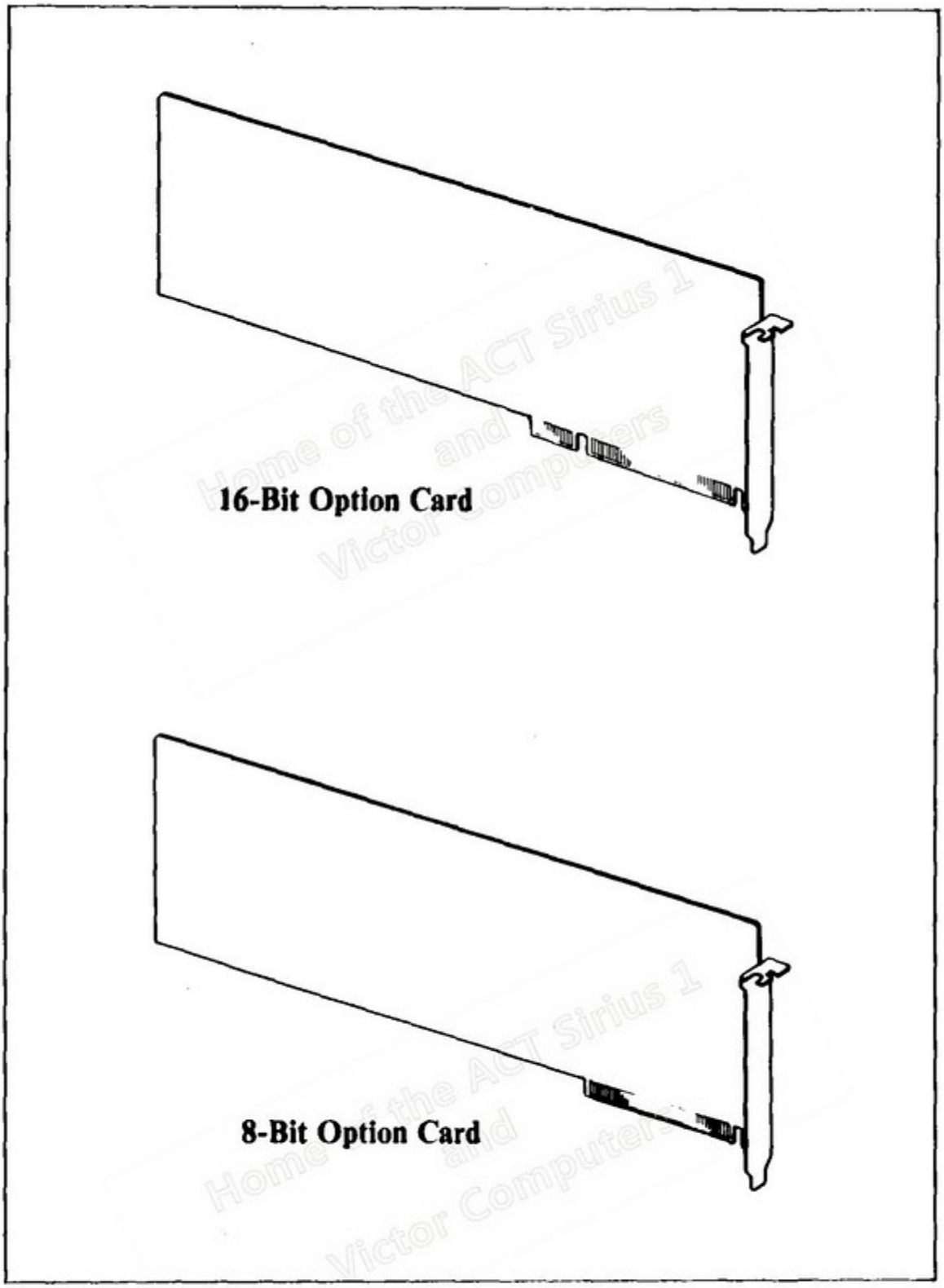


Figure A-4: Option Cards

A.3.3 Installation

To install an option card in an expansion slot, follow these steps:

1. Remove the expansion slot's dummy mounting bracket from the rear panel of the system unit. For each expansion slot, there is an opening in the rear panel. The openings for slots not currently used are covered by dummy mounting brackets. Once you have selected a slot for the installation of your option card, remove the dummy mounting bracket as shown in Figure A-5. Save the screw from the dummy bracket; you will need it to secure the option card.

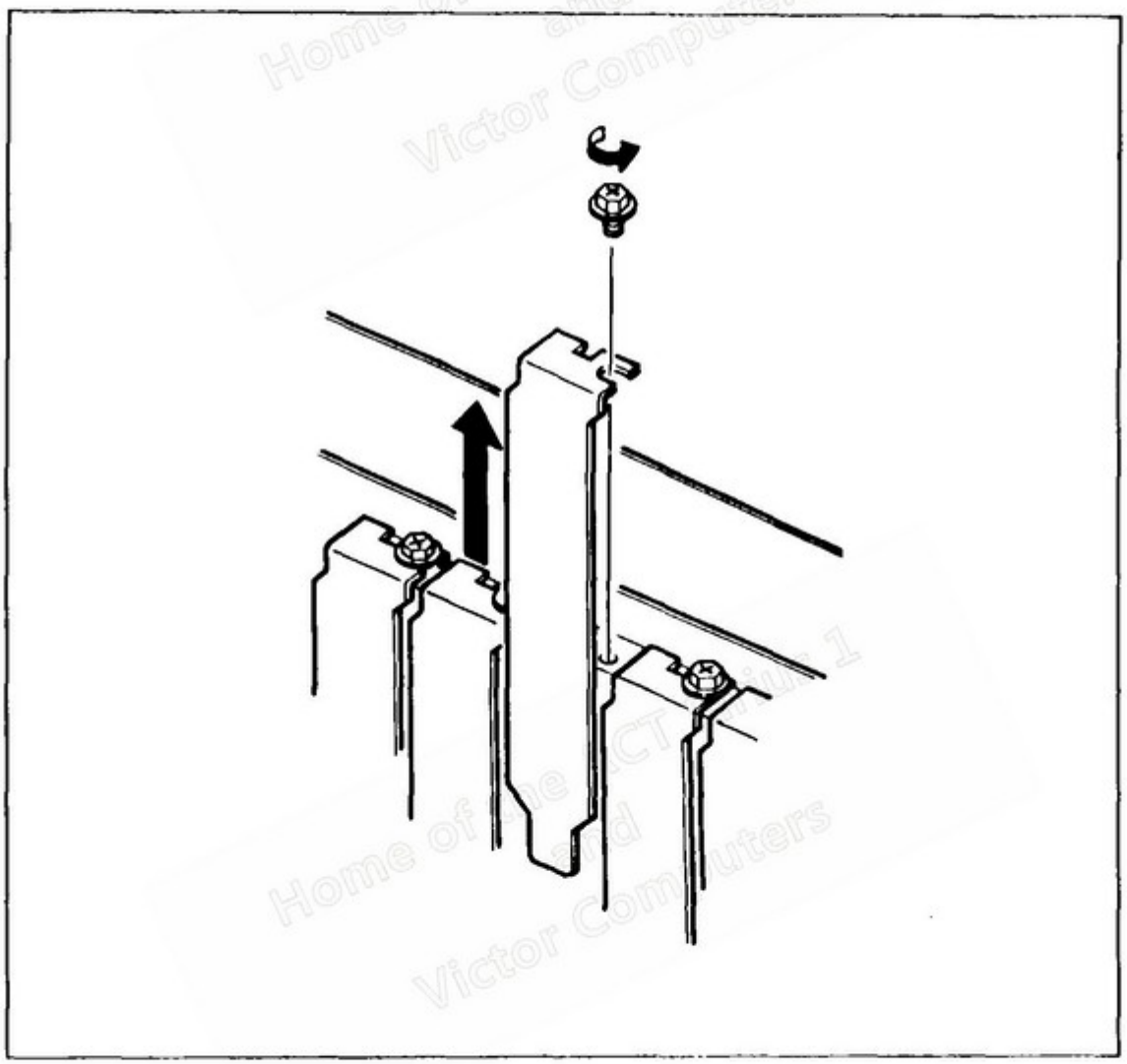


Figure A-5: Removing the Dummy Mounting Bracket

2. Insert the option card in the expansion slot as shown in Figure A-6. On the back of the system unit's front panel is a row of option card support brackets. Insert the option card so that the end with the mounting bracket faces the rear of the system unit and the other end is aligned with the support bracket. Press the option card straight down, gently inserting the tab(s) on the bottom of the card into the expansion slot. Use a gentle rocking motion if necessary.

3. Secure the option card's mounting bracket to the rear panel with the screw from the dummy mounting bracket.

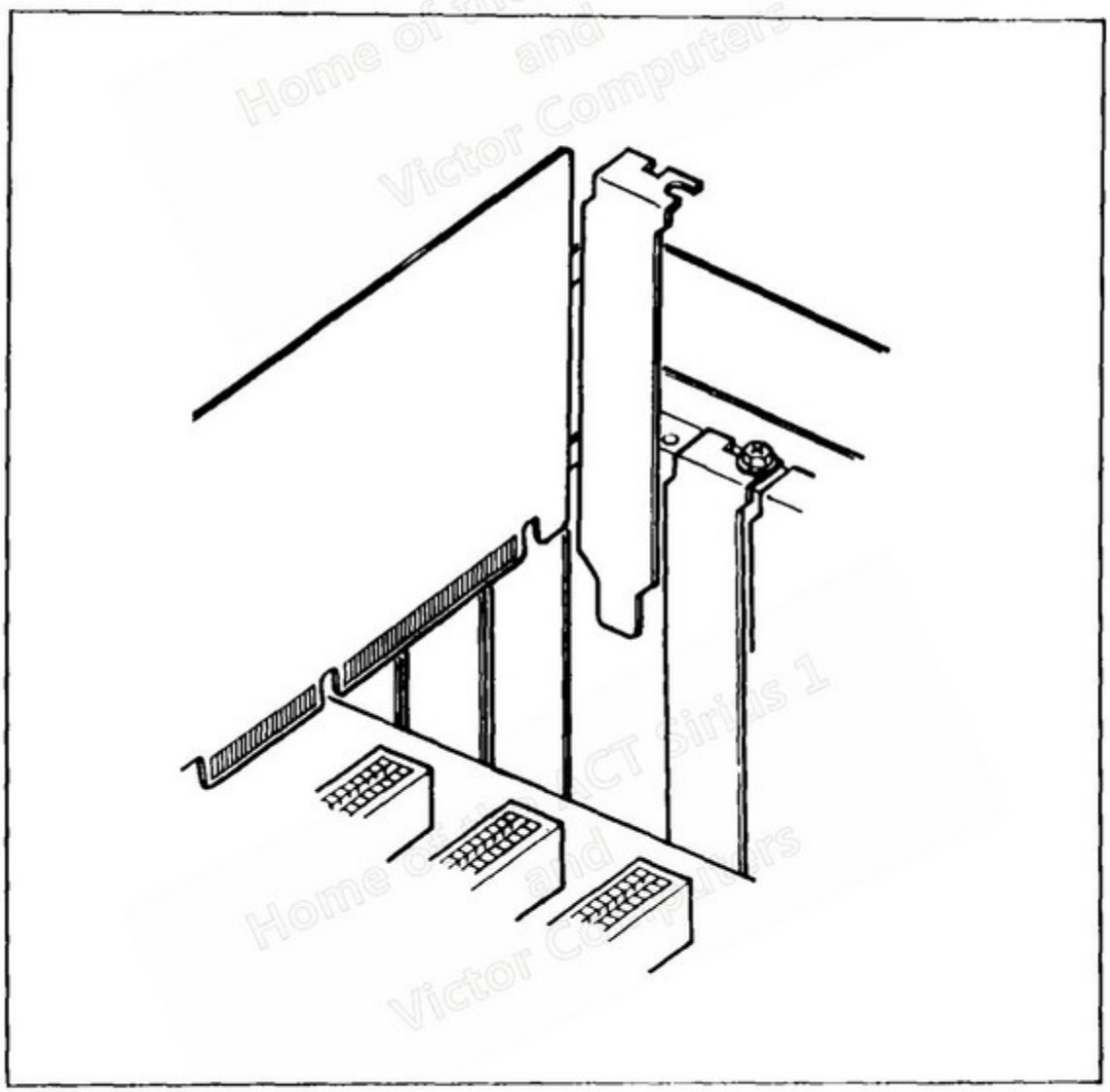


Figure A-6: Inserting an Option Card

Depending on the option card you are installing, it may or may not have to be connected by cable to another component in the system unit. Refer to your option card's documentation for instructions.

After you install the option card and any other internal options you want to install at the same time, replace the system unit cover by reversing the steps listed in Section A.1.

External Option Installation

Many external options are available for the VPC II. This appendix describes how to install two types of external options: parallel printers and serial printers. Many other devices, such as graphics plotters and modems, can be used with the VPC II. For specific instructions on the installation of a particular option, consult the documentation for the option.

B.1 Installing a Parallel Printer

The parallel port on the rear panel of the VPC II system unit is labeled PRINTER. By default, all output directed to the MS-DOS device LPT1 is directed to that port.

Connect your parallel printer to the printer port using a standard Centronics-type parallel printer cable. Plug the male end of the cable (the end with protruding pins) into the printer port of the system unit, as shown in Figure B-1. Plug the other end into the Centronics port of your printer.

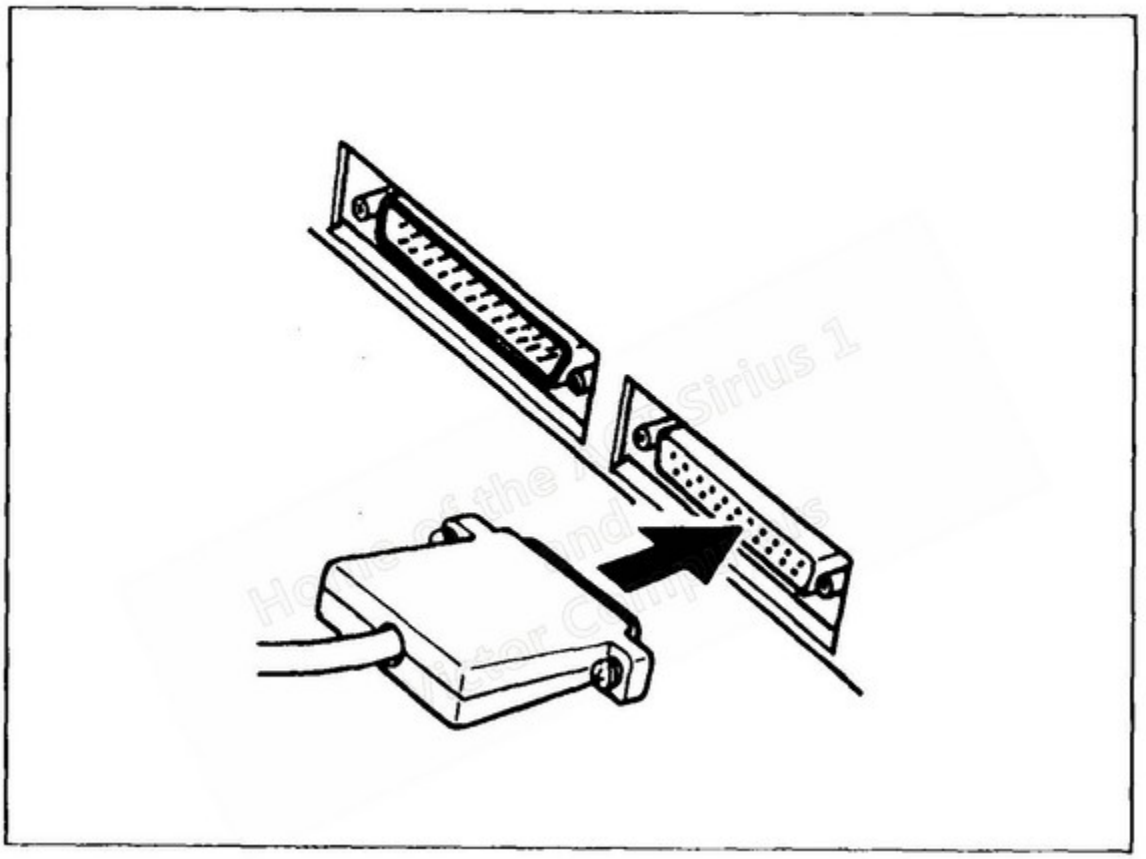


Figure B-1: Parallel Printer Connection

Because the printer port is the default output port for the VPC II, no further installation procedures are necessary.

Refer to your printer's documentation to determine whether you must set dip switches on the printer itself or perform other initialization procedures. Some application programs require that you perform certain software installation procedures to prepare the program to communicate correctly with a particular printer. See your application program documentation for details.

B.2 Installing a Serial Printer

The serial port on the back of the system unit is labeled RS-232C. This port corresponds to the MS-DOS device COM1. To connect a serial printer to the port, you must do three things:

1. Connect the serial printer to the serial port with an appropriate cable.
2. Initialize the serial port using the MS-DOS MODE command.
3. Redirect line printer (LPT) output to the serial port, using the MS-DOS MODE command.

B.2.1 Serial Port Cabling

The VPC II RS-232C port uses a standard 25-pin RS-232C connector. If your serial printer is also a standard type, you should have no difficulty purchasing a suitable cable.

B.2.2 Initializing the Serial Communications Port

Once you have physically connected your serial printer to the VPC II serial port, you must initialize the port using the MODE command. The format of the command is as follows:

mode com1:baud rate, parity, databits, stopbits, p

baud rate specifies the number of bits per second to be sent to the communications port. The following baud rates are valid:

110	1200
150	2400
300	4800
600	9600

The baud rate you should enter depends on your printer; consult your printer's documentation.

parity specifies whether or not parity checking is performed on the data sent through the communications port and if so, whether parity is to be odd or even. Enter N for no parity, O for odd, or E for even. Consult your printer's documentation for the correct parity.

databits specifies how many bits of each byte sent will carry data. The possible values are 7 and 8. (If you specify parity, you must specify 7 data bits, because one bit is required for parity checking.) Consult your printer's documentation for the correct number of data bits.

stopbits specifies whether one or two stop bits are sent. Again, consult your printer's documentation.

p enables continuous retries on timeout errors.

Whenever you plan to use the serial printer, you must initialize the serial port when you start your system. If you use a serial printer exclusively, you can enter the correct MODE command in your CONFIG.BAT file (see Section 5.6).

B.2.3 Redirecting Printer Output to the Serial Port

Once you have initialized the serial port with the MODE command, you must use another MODE command to redirect line printer (LPT) output to the serial port.

The default MS-DOS printer device is LPT1. To redirect the device's output to the serial port you have initialized (COM1), enter the following command:

```
mode lpt1:=com1
```

After you execute this command, all printer output is sent to your serial printer.

If you use a serial printer exclusively, you can enter the MODE LPT:=COM1 command, as well as the serial port initialization MODE command, in your CONFIG.BAT file (see Section 5.6).

Main Circuit Board Switch Settings

The main circuit board of the VPC II system unit includes two dip switch blocks, illustrated in Figure C-1. The switches have been set to match your system's original configuration. If you change the configuration, or if you are having problems with any components, you should verify the switch settings described in this appendix.

In the descriptions that follow, switch number 1 of switch block 1 is referred to as switch 1-1, switch number 2 of switch block 1 as switch 1-2, and so on. The table below shows the function of each switch.

SWITCH	ATTRIBUTE	ON	OFF
1-1	(not used)		
1-2	8087 coprocessor	not installed	installed
1-3	(not used)		
1-4	(not used)		
1-5	display type (used with switch 1-6)		
1-6	display type (used with switch 1-5)		
1-7	floppy disk drives	1 drive	2 drives
1-8	floppy disk drives	1 or 2 drives	(not used)
2-1	RS-232C circuit	built-in	option card
2-2	printer interface	built-in	option card
2-3	I/O cycle	add 1 wait state	normal
2-4	RS-232C circuit	built-in	option card
2-5	printer interface	built-in	option card
2-6	RAM chip type	256K	64K

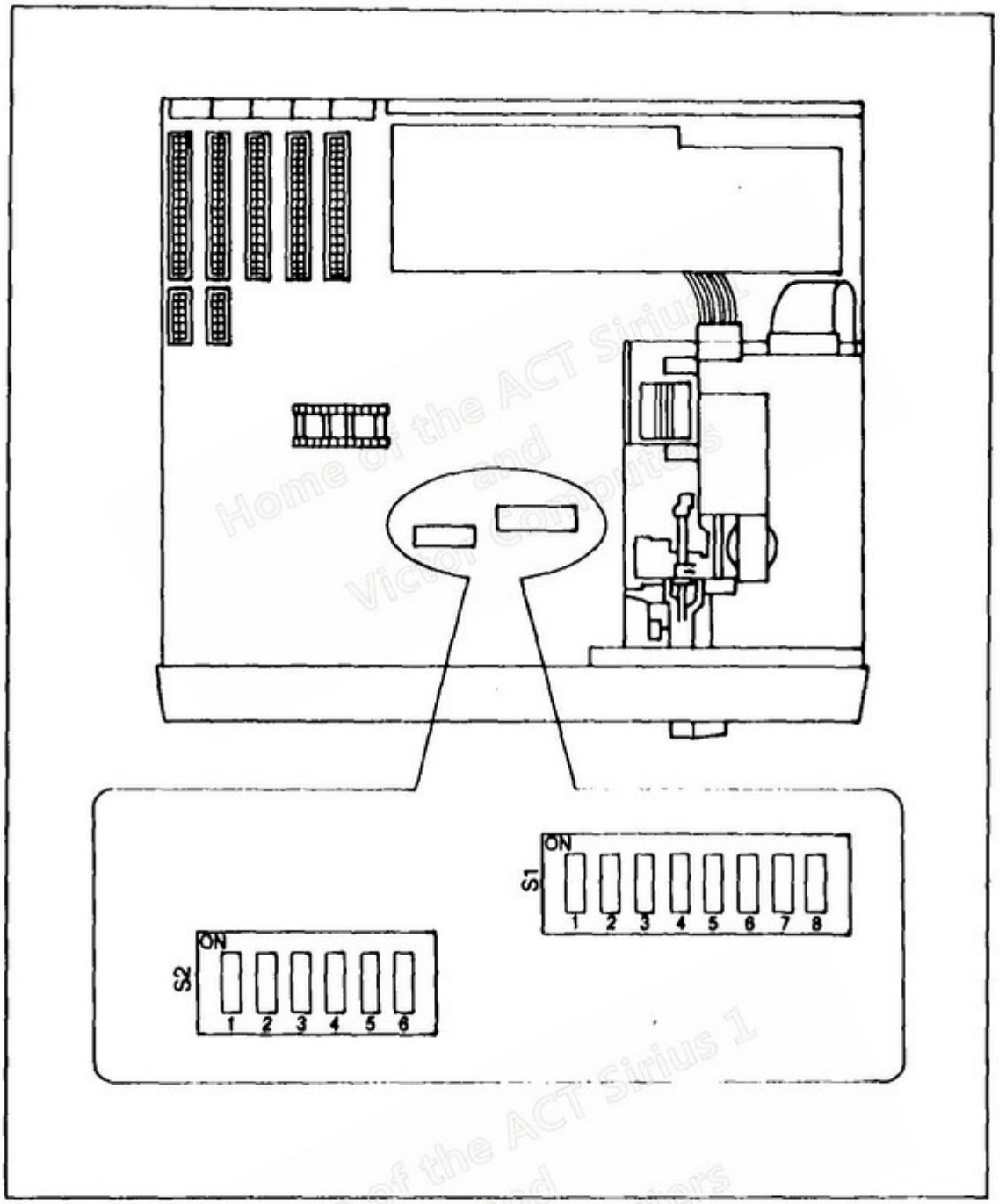


Figure C-1: Main Circuit Board Dip Switches

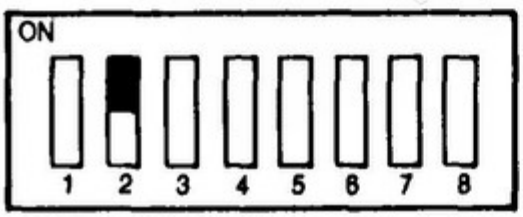
Switch Block 1

Switch 1-1

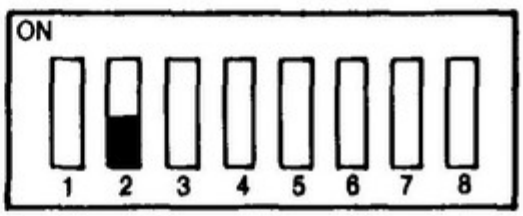
Switch 1-1 is not used and can be set on or off.

Switch 1-2

The correct setting for switch 1-2 depends on whether or not your system includes an 8087 math coprocessor. If no 8087 is installed, switch 1-2 should be in the on position. If you install an 8087, set switch 1-2 to the off position.



8087 not installed



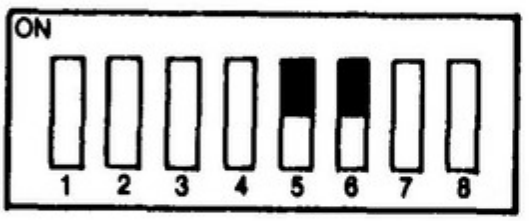
8087 installed

Switches 1-3 and 1-4

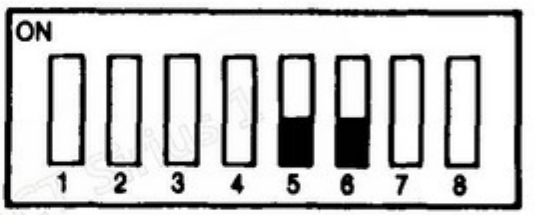
Switches 1-3 and 1-4 are not used and are factory-set to the off position.

Switches 1-5 and 1-6

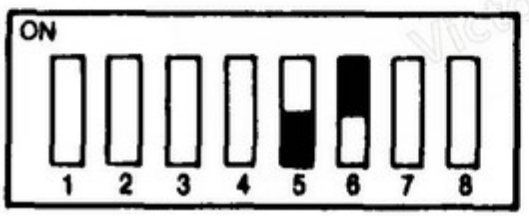
These two switches are set according to the type of display adapter card installed in the VPC II.



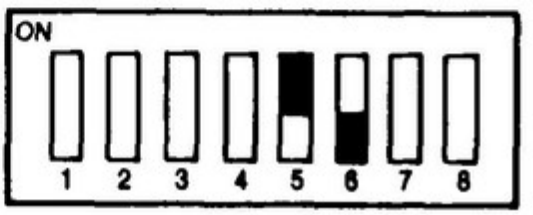
No display adapter



80-column monochrome adapter



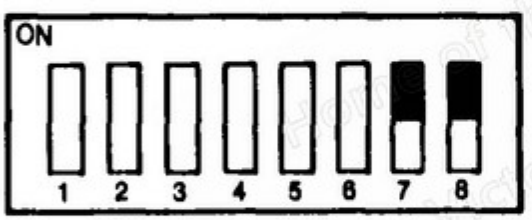
40-column color adapter



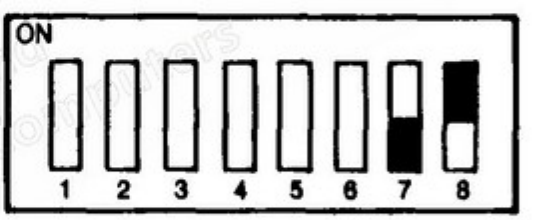
80-column color adapter

Switches 1-7 and 1-8

These two switches are set according to the number of floppy disk drives installed in your system. The two configurations are as follows.



One floppy disk drive

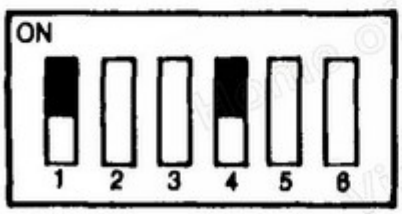


Two floppy disk drives

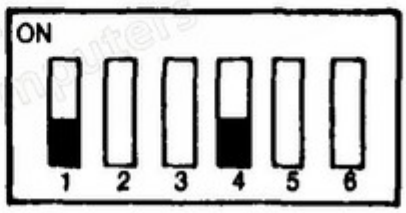
Switch Block 2

Switches 2-1 and 2-4

Switches 2-1 and 2-4 together determine whether the system uses the built-in RS-232C port or includes an RS-232C port on an option card. If you are using the built-in RS-232C port, both switches should be set to the on position. If you have installed an RS-232C port on an option card, set both switches to the off position.



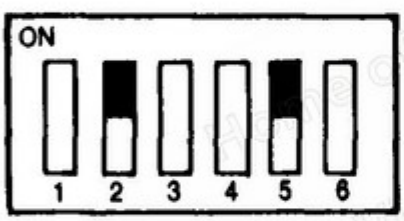
Built-in RS-232C



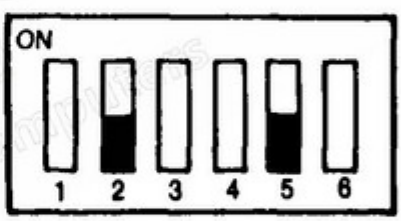
Option card RS-232C

Switches 2-2 and 2-5

Switches 2-2 and 2-5 together determine whether the system uses the built-in parallel printer interface or a parallel printer interface on an option card. If you are using the built-in printer interface, both switches should be on. If you have installed a printer interface on an option card, set both switches to the off position.



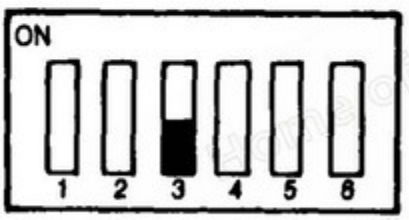
Built-in printer interface



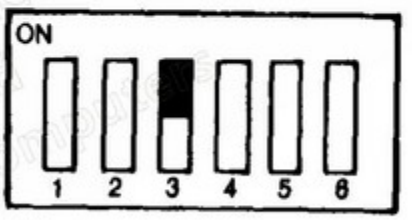
Option card printer interface

Switch 2-3

This switch determines whether or not an extra wait state is inserted in the I/O cycle. The normal I/O cycle includes one wait state. Leave switch 2-3 set to off to retain the normal I/O cycle with one wait state. To insert an extra wait state in the I/O cycle, set switch 2-3 to the on position. The extra wait state is inserted when the CPU or the direct memory access controller (DMAC) accesses an I/O device or when the DMAC reads data from memory.



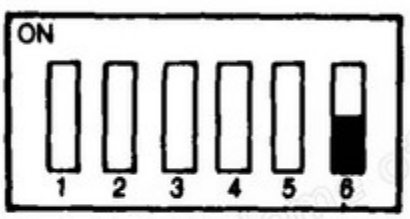
Normal I/O cycle



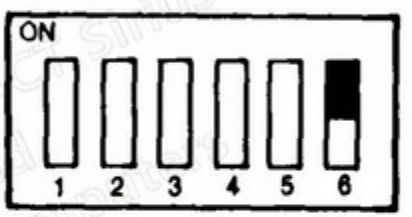
Insert extra wait state

Switch 2-6

Switch 2-6 is set to correspond to the type of RAM chips installed in your system. If your system has 64K RAM chips, switch 2-6 should be in the off position. If your system has 256K RAM chips, switch 2-6 should be in the on position.



64K RAM chips



256K RAM chips

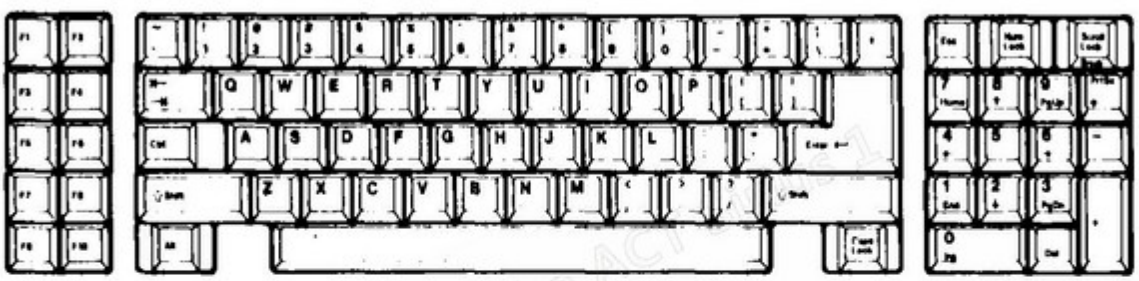
International Keyboards

The VPC II is available with five different keyboards: American, French, German, Swedish, and United Kingdom. The layout of each keyboard is shown in Section D.1.

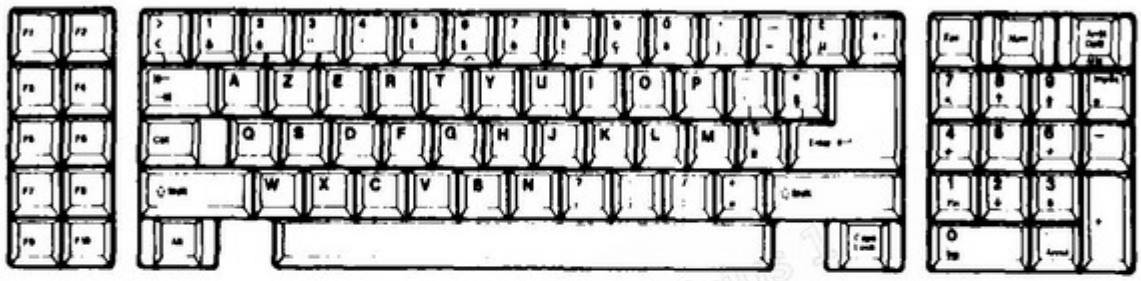
Each keyboard requires appropriate keyboard software to function properly. The software for the American keyboard is built into the VPC II's read-only memory (ROM). Keyboard software for the international keyboards is discussed in Section D.2.

D.1 Keyboard Layouts

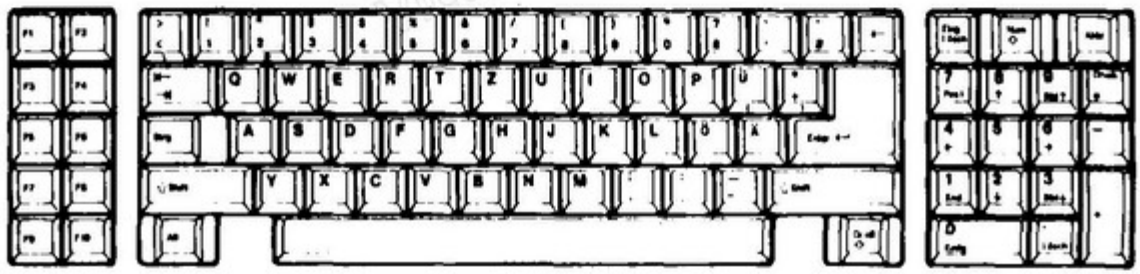
American Keyboard



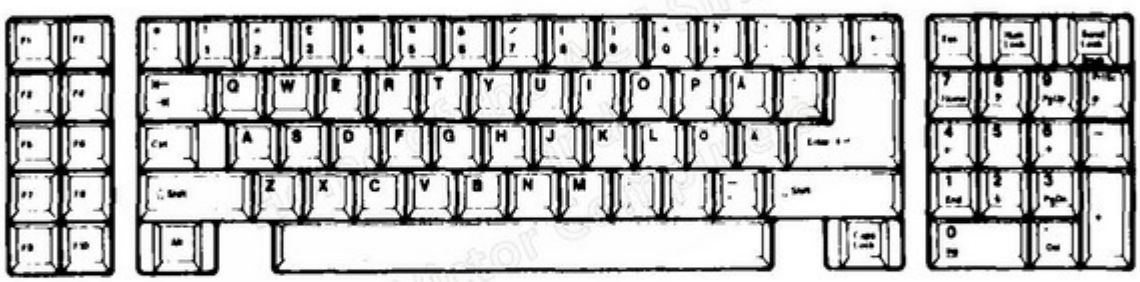
French Keyboard



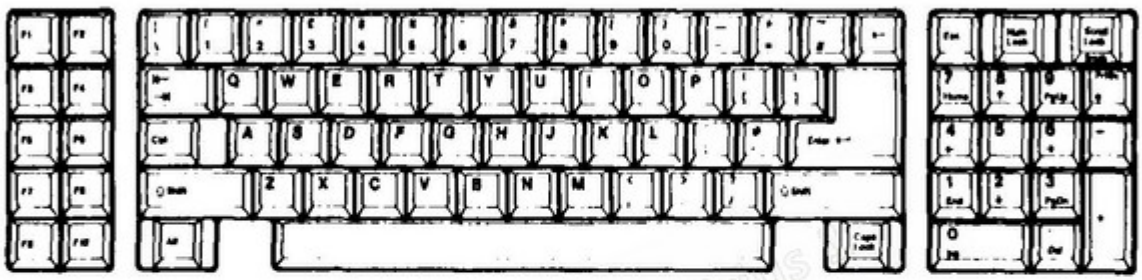
German Keyboard



Swedish Keyboard



United Kingdom (British) Keyboard



D.2 International Keyboard Software

The following international keyboard files are contained on your MS-DOS system diskette:

KEYBDA.COM	Denmark	KEYBNO.COM	Norway
KEYBSU.COM	Finland	KEYBSP.COM	Spain/Mexico
KEYBFR.COM	France	KEYBSV.COM	Sweden
KEYBGR.COM	Germany	KEYBUK.COM	U. K.
KEYBIT.COM	Italy		

To use an international keyboard, you must load the appropriate keyboard file into system memory whenever you use the corresponding keyboard. You can load a keyboard file directly from the command-line prompt. For example, to load the Swedish keyboard, enter

```
keybsv
```

The Swedish keyboard program will replace the American keyboard program loaded from ROM.

D.2.1 Invoking a Keyboard Program from the CONFIG.BAT File

If you have one of the international keyboards illustrated in Section D.1, you can load the corresponding keyboard file each time you start the operating system. Do this by putting the appropriate keyboard command in your CONFIG.BAT file. Section 5.6 describes how to create a CONFIG.BAT file.

D.2.2 Creating a New System Diskette with the SELECT Command

You can use the MS-DOS SELECT command to create a copy of the system diskette that automatically loads the appropriate keyboard program and sets the currency symbol and decimal separator to the appropriate values for the country whose keyboard you are using.

To use SELECT, first insert your MS-DOS diskette 1 in drive A. Then enter the SELECT command, followed by the country and keyboard codes for the keyboard program you want to use. You are prompted through the steps to copy your MS-DOS diskette onto a new working diskette. This diskette contains an AUTOEXEC.BAT file that loads the specified keyboard program whenever you start the operating system, and a CONFIG.SYS file that specifies the currency symbol and decimal separator. (Refer to the *MS-DOS 3.1 Reference* for more information about the CONFIG.SYS file.)

The format of the SELECT command is as follows:

```
select xxx yy
```

xxx is a three-digit country code that specifies the currency symbol and decimal separator. The appropriate country codes for the available international keyboard files are the following:

Denmark	045	Mexico	052
Finland	358	Norway	037
France	033	Spain	034
Germany	049	Sweden	046
Italy	039	U. K.	044

yy is a two-character keyboard code that specifies the keyboard file. These are the appropriate keyboard codes for the available international keyboard files:

Denmark	DA	Mexico	SP
Finland	SU	Norway	NO
France	FR	Spain	SP
Germany	GR	Sweden	SV
Italy	IT	U. K.	UK

The SELECT command for each available keyboard file is as follows:

Denmark	**select 045 da**
Finland	**select 358 su**
France	**select 033 fr**
Germany	**select 049 gr**
Italy	**select 039 it**
Mexico	**select 052 sp**
Norway	**select 037 no**
Spain	**select 034 sp**
Sweden	**select 046 sv**
U. K.	**select 044 uk**

D.2.3 Changing from an International Keyboard to the American Keyboard

You can access only one international keyboard program at a time. You can, however, switch back and forth between the international keyboard layout and the American keyboard layout.

After you have loaded an international keyboard program, you can switch to the American keyboard layout by pressing the Ctrl, Alt, and F1 keys simultaneously. To switch back to the international keyboard layout, press Ctrl, Alt, and F2.

Note: This discussion applies only to the keyboard layout specified by the software. The physical layout of your keyboard does not change. If you use a software keyboard layout with a different physical keyboard layout, some of the keys on your keyboard will produce characters different from their labels.

Troubleshooting

This appendix deals with operation problems that might arise because your system is set up incorrectly or because you have made an error.

If you try the procedures suggested in this appendix and your system still does not operate satisfactorily, go on to Appendix F, "Initial Power-On Diagnostics Error Codes," and Appendix G, "Running the Diagnostic Programs." Go through the procedures described in those two appendixes and write down any error messages you receive, before you have your system serviced. You should also verify the switch settings listed in Appendix C to make sure the dip switches are set correctly for your system's configuration.

The following are some common problems that users sometimes experience with a new computer system, possible causes of those problems, and suggested solutions.

Problem: When you turn the system unit switch on, nothing happens.

Possible causes:

1. The power cord is not plugged into the rear panel of the system unit.
2. The power cord is not plugged into the wall outlet.
3. There is no power at the wall outlet.

Solutions:

1. Plug the power cord securely into the power input socket on the rear panel of the system unit.
2. Plug the power cord into a grounded wall outlet or bus bar.
3. Check the wall outlet by plugging a light or other device into it to determine whether there is power to the outlet. If there is no power to the outlet, find out if the outlet is operated by a wall switch. If the outlet is not switched, check your circuit breaker box or fuse box.

Problem: When you turn the system unit on, it appears to be operating (the fan begins to operate and the fixed disk drive indicator light turns on), but nothing appears on the display unit.

Possible causes:

1. The display unit is not turned on.
2. The display unit contrast control is out of adjustment.
3. The display unit power cord is not plugged into a live outlet.
4. The display unit is not correctly cabled to the display unit connector on the rear panel of the system unit.

Solutions:

1. Turn the display unit on. Unlike some portable computer systems with built-in display units, the display unit for the VPC II is separately powered and must be separately turned on.
2. Turn the display unit contrast control knob all the way in both directions. It is possible that the display unit is functioning properly, but that the contrast is too low for the display to be visible.
3. Make sure the display unit is plugged into a live outlet. Depending on the kind of plug your display unit has, this can be either a wall outlet or the AC outlet on the rear panel of the system unit.
4. Make sure the video cable from the display unit is securely connected to the video output jack on the rear panel of the system unit.

If you experience other problems with any external devices attached to the system unit, try the following procedures before concluding that your system is malfunctioning:

1. Turn the system unit off and then turn all connected external devices off.
2. Unplug the system unit power cord from the wall outlet.
3. Unplug all external devices from the wall outlet.
4. Disconnect the cables for all external devices from their connectors on the rear panel of the system unit.
5. Check the wall outlet for power by plugging a lamp or other device into it.
6. Reconnect all external devices, making sure that each cable is correctly and securely fastened to the appropriate connector.
7. Plug in the system unit and all external devices.
8. Turn the external devices on. Then turn the system unit on.

If the problem persists, and you are unable to operate your system at all, call a service technician. If the system operates, but not correctly, refer to Appendixes C, F, and G to try to determine the source of the problem before you call for service.

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Initial Power-On Diagnostics Error Codes

Whenever you turn the VPC II on or reset it using the reset button, the system performs a number of internal diagnostic tests before loading the operating system. Normally, these tests encounter no faults in the system, and the only screen display you see is the random-access memory (RAM) check message:

```
XXXKB OK
```

XXX represents the amount of RAM successfully checked.

The initial power-on diagnostics also include several other checks that, if successful, are invisible to the user. Each of these checks, including the RAM check, can generate error messages if a fault in the system is encountered. This appendix lists and describes the error codes associated with each check.

F.1 System Device Check

If the system device check encounters an error, it generates an error code in the form of audible speaker tones, and then the processor halts. You can determine the type of error by counting the number of beeps, as follows:

5 beeps	Video RAM failure
6 beeps	Bad timer or PIC
12 beeps	Video SYNC failure

If you receive a system device error, record the number of beeps and report it to your service technician.

F.2 RAM Check

The RAM check can fail in either of two ways:

- If the error occurs in the first 64K of memory, the processor will halt.
- If the error occurs after the first 64K of memory, the following error message is displayed:

  XX YYYY 201

  XX represents (in hexadecimal notation) the 32K segment of memory in which the error was encountered. **YYYY** represents (in hexadecimal notation) the bit(s) in error, and is the result of an XOR'd operation between the expected and actual data patterns.

If your system fails or if you receive a 201 error message, write down the message and report the problem to your service technician.

F.3 Keyboard Controller and Keyboard Check

The keyboard controller and keyboard check can generate error code 301, in either of two formats:

301

XX 301

A 301 error code in the first format indicates a fault in the connection between the system unit and the keyboard unit. Check the connection and reset the system before calling for service.

The error code appears in the second format if an error is encountered with a specific key. **XX** is the hexadecimal number that identifies the faulty key. If you receive this error code, write down the value of **XX** and report it to your service technician.

F.4 Display Card Check

If the display card check encounters an error in a monochrome or color adapter card, the speaker will beep either 5 or 12 times.

If you receive either error code, check the dip switch settings (refer to Appendix C). Report the number of beeps to your service technician.

F.5 Floppy Disk Drive Seek Check

If this check encounters an error, it reports error code 601. This error can occur if the system diskette is not correctly inserted in the drive. Make sure the diskette is in the drive and that the drive latch is closed, and then reset the system. If the error occurs again, try loading the operating system with another bootable diskette. If you still receive a 601 error, have the floppy disk drive serviced.

F.6 Fixed Disk Controller and Fixed Disk Check

If an error is encountered in the fixed disk controller or the fixed disk drive, error code 1701 is displayed.

Check the cables between the fixed disk drive and the controller, and check the power supply cable. Ensure that the controller card is seated correctly in the expansion connector and that the jumpers and/or the switch settings are correct. If you still receive the error code, report the problem to your service technician.

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Running the Diagnostic Programs

The diagnostics diskette supplied with the VPC II contains several diagnostic programs that you can access from the diagnostics diskette Main Menu. These programs allow you to check the various hardware components of your system to verify that they are operating correctly or to identify any hardware problems that do occur. There is no need to run these programs during normal operations.

If you suspect a hardware-related problem, you should run the diagnostic programs before seeking service. The information you receive will help you determine whether or not service is necessary. If your system does require service, you will be able to pass on valuable information to the service technician about the problem.

You should also run the diagnostic programs whenever you move your system from one place to another or add a new device to the system.

To access the diagnostics diskette Main Menu, boot the system from the diagnostics diskette. To do so, turn the system unit on and insert the diagnostics diskette in drive A or, if the system unit is already on, insert the diagnostics diskette in drive A and press the reset button.

After the initial power-on diagnostics have run, the screen displays the following message:

```
Diagnostics program Rev. x.xx

Press any key to start.
```

When you press a key, the system configuration screen is displayed. The contents depend on your system's configuration. The screen shown below is for a system with one floppy disk drive, a fixed disk, and a monochrome adapter:

```
SYSTEM CONFIGURATION

System board
Monochrome adapter
1 disk drive(s)
1 fixed disk drive(s)
640 KB memory

If OK, press [Y] key.
If not, press [N] key.
```

If the system configuration information listed on the screen does not correspond to your system's actual configuration, press N; otherwise, press Y. If you press N, a configuration error message is sent to the system error log, but you can still proceed with the diagnostics checks (see Section G.5 for details on the system error log).

G.1 The Diagnostics Diskette Main Menu

The diagnostics diskette Main Menu offers five options:

```
MAIN MENU

1 - AUTOMATIC SYSTEM CHECK
2 - INDIVIDUAL COMPONENT CHECK
3 - ERROR LOG MENU
4 - COPY DIAGNOSTICS DISKETTE
0 - EXIT DIAGNOSTICS

Select a number from this menu.
```

These options are explained in the following sections.

G.2 Copying the Diagnostics Diskette

If you are using the diagnostics diskette for the first time, you should make a working copy of it before you select any of the other menu options. You cannot copy the diagnostics diskette with the MS-DOS COPY or DISKCOPY commands. Select option 4 from the Main Menu to copy the diagnostics diskette. When you do so, this message is displayed:

```
COPY function.

Insert DIAGNOSTICS PROGRAM diskette in drive A.

Press [ENTER] key to start loading.
Press [ESC] key to exit.
```

The master diagnostics diskette should already be in drive A; if it is not, insert it. Then press Enter. The system copies the contents of the diagnostics diskette into memory and displays the following message:

```
Loading completed.

Insert a target diskette in drive A.

Press [ENTER] key to start copying.
Press [ESC] key to exit.
```

Remove the master diagnostics diskette from drive A and replace it with a blank, formatted diskette. Then press Enter. When the copying operation is complete, this message is displayed:

```
Copy completed.

Press any key to return to MAIN MENU.
```


You have now made a working copy of the diagnostics diskette. Store the master diagnostics diskette in a safe place, and use the working copy for all diagnostic operations.

G.3 Automatic System Check

If you select option 1, Automatic System Check, from the Main Menu, the program automatically runs all of the Individual Component Checks, except for the keyboard check, which requires your input. When you select this option, the following message is displayed:

```
PREPARATION FOR AUTOMATIC SYSTEM CHECK

Caution!  Data on the diskette in drive A
          will be destroyed.

Insert a blank, formatted diskette in drive A.

Are you ready to continue (Y/N)?
```

To proceed with the checks, replace the diagnostics diskette in drive A with a blank, formatted diskette or a diskette containing data that you no longer need. Then enter Y. To cancel the checks and go back to the Main Menu, enter N.

The individual component checks performed by the Automatic System Check are discussed in Section G.4.

G.4 Individual Component Check

When you select option 2, Individual Component Check, from the Main Menu, the screen displays the Individual Component Check Menu:

```
INDIVIDUAL COMPONENT CHECK MENU

1 - SYSTEM BOARD CHECK
2 - RAM READ/WRITE CHECK
3 - KEYBOARD CHECK
4 - DISKETTE READ/WRITE CHECK
5 - DISPLAY CHECK
6 - PRINTER CHECK
7 - FIXED DISK CHECK
0 - RETURN TO MAIN MENU

Select a number from this menu.
```

G.4.1 System Board Check

Select option 1 to test the system board. This test checks the components of the main system board. During an error-free system board check, the program displays messages identifying the component or operation being tested. If an error is found, an error message is displayed identifying the defect and listing the appropriate action you should take.

G.4.2 RAM Read/Write Check

If you select option 2 from the Individual Component Check Menu, the screen displays this message:

```
RAM READ/WRITE CHECK

Press [ENTER] key to start.
Press [ESC] key to exit.
```

When you press Enter, the program begins writing data to RAM, reading the data back, and comparing the data written to the data read. During this process, the following message is displayed:

```
Checking memory ...
```

If the program finds no RAM errors, these messages appear when the check is completed:

```
RAM read/write check is OK.

Press any key to return to INDIVIDUAL COMPONENT
CHECK MENU.
```

If the RAM read/write check encounters a fault in RAM, an error message in the following format is displayed:

```
RAM read/write error
 segment    - WWWW
 offset     - XXXX
 write data - YYYY
 read data  - ZZZZ
```

WWWW is a four-digit hexadecimal number identifying the memory segment in which the fault was found.

XXXX is a four-digit hexadecimal number identifying the offset of the faulty word within the sector identified by **WWWW**.

YYYY is a four-digit hexadecimal number that represents the data written to the faulty word by the program.

ZZZZ is a four-digit hexadecimal number that represents the data that was read back from the faulty word.

G

G.4.3 Keyboard Check

If you choose option 3 from the Individual Component Check Menu, the screen displays the following message:

```
KEYBOARD CHECK

Press [ENTER] key to start.
Press [ESC] key to exit.
```

When you press Enter, you are presented with a blank layout of the American keyboard. You perform the keyboard layout test by pressing individual keys on the VPC II keyboard. When you press a key, its label (or an abbreviation of the label) should appear at the corresponding position on the keyboard layout screen. (If you have an international keyboard, refer to American keyboard in Appendix D for the key labels that will appear.)

You can exit from the completed keyboard layout check in two ways:

- If the keyboard layout is correct, press Y, and then press Enter. You are returned to the Individual Component Check Menu.
- If the keyboard layout is not correct, press N, and then press Enter. The program displays the error message "Keyboard is not correct." The message is saved in the system's error log, and you are prompted to press any key to return to the Individual Component Check Menu (see Section G.5 for details on the system error log).

G.4.4 Diskette Read/Write Check

The message displayed when you select option 4 from the Individual Component Check Menu depends on whether you are using a single-floppy disk system or a dual-floppy disk system.

For a single-floppy disk system, the display is as follows:

```
*********************************
*  DISKETTE READ/WRITE CHECK    *
*        Caution!               *
*    Data will be destroyed.    *
*********************************

Press [A] key to check drive A.
Press [ESC] key to exit.
```

For a dual-floppy disk system, the option of checking drive B is added:

```
Press [A] key to check drive A.
Press [B] key to check drive B.
Press [ESC] key to exit.
```

After you specify the drive to check, the program prompts you to insert a blank, formatted diskette in the appropriate drive and press Enter to start the check. The program proceeds to write data to each sector and track of the diskette and to read the data back, comparing the data written to the data read back.

During the check, a constantly changing four-digit hexadecimal number is displayed on the screen. The number identifies the track, sector, and side of the diskette currently being checked. The first two digits identify the track, 00–27h (0–39 decimal). The third digit identifies the sector, 0–9. The fourth digit identifies the side of the diskette, 0 or 1.

If the program encounters no errors, at the end of the check this message is displayed:

```
2791
Diskette read/write check is OK.

Press any key to retry.
```

When you press a key, you are returned to the drive selection prompt. You can now check drive B if you have a dual-floppy disk system. If you have no drive B or choose not to check drive B, just press Esc from the drive selection prompt to return to the Individual Component Check Menu.

The Diskette Read/Write Check can generate three types of error messages:

- If you attempt to start the Diskette Read/Write Check with the diagnostics diskette in the designated drive, the program displays this message:

```
Caution!  The diskette in the designated drive
          is the DIAGNOSTICS PROGRAM diskette.

Press any key to retry.
```

▶ If the designated drive does not contain a diskette, if the drive latch is open, or if the diskette in the designated drive is not an MS-DOS formatted diskette, the program displays the following message:

```
Diskette or drive error.

Press any key to retry.
```

▶ If a status or read/write error occurs during the check, a message in the following format is displayed:

```
Diskette read/write error
WXYYZ

Press any key to retry.
```

W identifies the drive on which the error was encountered. If **W** is 0, the error was found on drive A. If **W** is 1, the error was found on drive B.

X identifies the read/write head that encountered the error. **X** can be either 0 or 1. (Read/write head 0 reads side 0 of the diskette; head 1 reads side 1 of the diskette.)

YY identifies the track at which the error was encountered. **YY** ranges from 0 to 27h (0 to 39 decimal).

Z identifies the sector at which the error was encountered. **Z** ranges from 0 to 9.

Diskette read/write errors are most often caused by worn or defective diskettes. If you receive a read/write error, run the check again on a new, freshly formatted diskette. If the error persists, write down the error message, and have your floppy disk drive serviced.

To exit from the Diskette Read/Write Check and return to the Individual Component Check Menu, press any key to get from the retry prompt to the drive selection prompt, then press Esc in response to the drive selection prompt.

G.4.5 Display Check

If you select option 5 from the Individual Component Check Menu, the following message is displayed:

```
DISPLAY CHECK

Press [ENTER] key to start.
Press [ESC] key to exit.
```

Once you press Enter to start the Display Check, the screens you see depend on the type of display adapter card installed in your system.

Monochrome Display Check

If you have a monochrome display and adapter, the program displays the attribute check screen. Refer to your printer's documentation for examples of how the display should appear. If the display is correct, press Y. If not, press N. In either case, the program next displays the 80-column character set. If the character set is correct, press Y. If it is not, press N. In either case, you are returned to the Individual Component Check Menu.

Note: The display check does not generate any error messages on its own. It is up to you to identify display errors by examining your system's displays. When you identify a display error by pressing N in response to the prompt at the bottom of any screen of display data, an appropriate error message is recorded in the error log, although no error message is immediately displayed (see Section G.5 for details on the system error log).

Color/Graphics Display Check

If a color/graphics display and adapter are installed in your system, the first screen of the display check is the attribute check screen.

After you press Y or N in response to the attribute check screen prompt, the color check is displayed on the same screen. The color check consists of 14 rows of hearts, each a different color. The following colors should be represented:

blue	black
green	high-intensity blue
cyan	high-intensity green
red	high-intensity cyan
magenta	high-intensity red
brown	high-intensity magenta
gray	yellow

(Black will be invisible against a black background.)

Once again, you are prompted to confirm that the screen display is correct. If it is, press Y; if it isn't, press N.

In either case, the screen next displays the 80-column character set. Check the character set; if it is correct, press Y in response to the prompt. If it is not, press N. Refer to your printer's documentation for examples of the character set.

The screen next displays the 40-column character set. Check the character set and respond accordingly to the prompt.

The next screen displayed is the 320 × 200 graphics, color set 0 screen. It should consist of rectangles of green, red, and yellow, displayed against a blue background. Press Y or N in response to the prompt, and color set 1 is displayed. The screen for color set 1 should consist of rectangles of cyan, magenta, and gray, displayed on a red background.

After you respond to the prompt for color set 1, the 640 × 200 monochrome graphics screen is displayed. After you respond to the 640 × 200 graphics screen prompt, screen 0 of the screen paging check is displayed. The screen should be filled with zeros.

Screens 1 through 7 of the screen paging check are similar to screen 0, except that the numbers 1 through 7 are substituted for the zeros.

After you respond to the prompt for screen 7 of the screen paging check, you are returned to the Individual Component Check Menu.

G.4.6 Printer Check

If you select option 6 from the Individual Component Check Menu, the following message is displayed:

```
PRINTER CHECK

Press [ENTER] key to start printing.
Press [ESC] key to exit.
```

To proceed with the printer check, make sure your printer is on line and ready to receive data. Then press Enter.

The screen should display the message "Checking printer..." and your printer should produce a printout. The characters actually printed depend on your printer's character set—refer to your printer's documentation to verify the character set.

If a hardware problem prevents the printer check from being executed, one or more of the following error messages is displayed:

Printer error
I/O error
Printer is not selected
Echo back error
Acknowledge is not received

These errors may indicate that your printer is not turned on, is not on line, or is not properly connected to the system unit. Check the appropriate switches and connections, and then retry the printer check.

The following messages indicate that your printer is busy printing another job or is out of paper. Correct the condition, and then retry the printer check.

Printer is busy
Out of paper

When the printer check is completed without encountering any errors, the message "Printer check is OK" is displayed. Whether or not the printer check is successful, this message is displayed upon completion of the check:


```
Press any key to return to INDIVIDUAL COMPONENT
CHECK MENU.
```

G.4.7 Fixed Disk Check

If you have one fixed disk drive (drive C), and you select option 7 from the Individual Component Check Menu, the following message is displayed:

```
**********************
*                    *
*  FIXED DISK CHECK  *
*                    *
**********************

Press (C) to check drive C.
Press [ESC] to exit.
```

If your system has a second fixed disk drive (drive D), the option of checking drive D is included in the prompt:

```
Press [C] key to check drive C.
Press [D] key to check drive D.
Press [ESC] key to exit.
```

When you press C or D to initiate the check, the program first checks the fixed disk controller, displaying the message "Checking the fixed disk controller..." When the fixed disk controller check is completed, the message "Fixed disk controller check completed" appears.

The program next checks the fixed disk's ability to locate given tracks and sectors randomly. During the check, the message "Checking random seek function..." is displayed. When the random seek check is completed, the message "Random seek check completed" is displayed.

Next, the program checks the fixed disk's ability to write data to and read data from free sectors of the fixed disk (no user data is destroyed by this check). During the check, the following message is displayed: "Checking fixed disk read/write function..." When the check is finished, the message "Fixed disk read/write check completed" is added.

The final part of the fixed disk check is the incremental seek check. This check tests the fixed disk's ability to locate each track and sector of the disk in sequence. During the check, this message is displayed: "Checking incremental seek function..." Upon completion of the check, the message "Incremental seek check completed" appears.

If errors are encountered during one of the four checks, appropriate error messages are displayed while the check is in progress. Any error messages generated are also sent to the system error log (see Section G.5 for details on the system error log).

When all four checks have been completed, this message is displayed:

```
All checks completed.

Press any key to retry.
```


Pressing a key returns you to the original fixed disk check prompt. Select the other drive to check, or press Esc to return to the Individual Component Check Menu.

G.4.8 Exiting from the Individual Component Check Menu

Select option 0 from the Individual Component Check Menu to exit from the menu and return to the Main Menu.

G.5 The Error Log Menu

One of the functions performed by the diagnostics programs is to maintain an error log in the system's main memory. Any errors encountered during the diagnostic checks are recorded in the error log. The errors include those for which error messages are spontaneously generated by the diagnostic programs. They also include errors generated when you answer N in response to one of the prompts asking you to confirm that a display is correct.

The error log is maintained in memory without any action on your part. To gain access to the error log, select option 3 from the diagnostics diskette Main Menu. The Error Log Menu appears:

```
ERROR LOG MENU

1 - LOAD     (loads and displays ERROR LOG data)
2 - SAVE     (saves error data in memory to diskette)
3 - PRINT    (prints out and displays error data)
4 - CLEAR    (clears error data and ERROR LOG data)
0 - RETURN   (returns to MAIN MENU)

Select a number from this menu.
```

G.5.1 Loading Error Log Data from Diskette

Option 1 from the Error Log Menu can be used only after you have saved error log data to a diskette. Option 1 loads error log data from a diskette into the system's error log memory, wiping out any error log data already in memory. The load option is thus appropriate only for displaying error log data from a previous diagnostic session.

If you have not yet saved any error log data to diskette, skip the rest of this section and go on to Section G.5.2.

If you select option 1 from the Error Log Menu, the following message is displayed:

```
LOAD command.

Caution!  Error data in memory will be overwritten
          by the ERROR LOG data on the diskette.

Insert diskette with ERROR LOG data in drive A.

Press [ENTER] key to start loading.
Press [ESC] key to exit.
```

As this message indicates, loading error log data from a diskette will destroy any error log data already in memory. If you want to proceed, put the diskette onto which you have saved an error log into drive A and press Enter.

Note: You can save error log data to the diagnostics diskette itself, or you can use a separate diskette. In either case, only one error log can exist on a diskette; subsequent saves will write over the existing error log. Thus, if you want to keep multiple error logs, you must use a separate diskette for each one.

When you press Enter, the error log data from the diskette is loaded into memory, and the following message is displayed:

```
Loading completed.
Press any key to display ERROR LOG data.
```

Press any key, and whatever data is contained in the error log is displayed on the screen. If no errors have been recorded in the error log, the message "There is no error" is displayed.

If you attempt to load error log data from a diskette to which no such data has been saved, this message is displayed:

```
Caution!  The diskette in drive A does
          not contain ERROR LOG data.

Press any key to return to
ERROR LOG MENU.
```

G

G.5.2 Saving Error Log Data to Diskette

Option 2 from the Error Log Menu allows you to save error log data about the current diagnostics session from system memory to diskette for later reference. When you select option 2, the following message is displayed:

```
SAVE command.

Insert diskette for saving ERROR LOG data
in drive A.

Press [ENTER] key to start saving.
Press [ESC] key to exit.
```

If you want the error log data written to the diagnostics diskette, leave that diskette in drive A and press Enter to start the save operation. If you want to use a different diskette for the error log data, insert that diskette in drive A before you press Enter.

When you press Enter, the program writes the current error log data from system memory onto the diskette in drive A. The program then displays the following message:

```
Saving completed.

Press any key to return to
ERROR LOG MENU.
```

G.5.3 Printing Error Log Data

Select option 3 from the Error Log Menu to produce a printout of the error log. Such a printout can be very helpful to service personnel if your system needs to be serviced.

You can print error log data about the current diagnostics session directly from system memory, without loading data from a diskette. Alternatively, you can print error log data from an earlier session by first loading that data from diskette (see Section G.5.1) and then selecting option 3.

When you select option 3, the following message is displayed:

```
PRINT command.

If printer is not connected, error data
is displayed only on the screen.

Press [ENTER] key to start printing.
Press [ESC] key to exit.
```

If your printer is on and ready when you press Enter, the program immediately begins to send the error log data to your printer. When the printout is complete, the following message is displayed:

```
Press any key to return to
ERROR LOG MENU.
```

If no printer is connected to your system, or if the printer is not on line, there is a pause after you press Enter. Then this message is displayed:

```
Printer is not connected.
Press any key to display error data.
```

When you press a key, the error log data is displayed on the screen, along with the prompt to press any key to return to the Error Log Menu.

Note: If you know that you want to display the error log data only on the screen, select option 2 to save the data to diskette, and then select option 1 to reload the data from diskette and display it. This procedure is faster than selecting option 3 and then waiting for the program to establish that the printer is not connected.

G.5.4 Clearing Error Log Data from Memory

Select option 4 from the Error Log Menu to clear all error log data from system memory and from the Error Log diskette. This option is useful if you have already checked the current error log data and you want to rerun certain checks to see if the same errors recur. If you do not clear the current error log data from memory before returning to the Main Menu and rerunning the checks, a check of the error log will not reveal whether a given error was generated during the first or second repetition of the check.

When you select option 4, the following message is displayed:

```
CLEAR command.

Caution!  Error data and ERROR LOG data
          will be cleared.

Press [ENTER] key to start clear.
Press [ESC] key to exit.
```

When you press Enter, the program clears the current error log data from memory and displays this message:

```
Clearing completed.

Press any key to return to
ERROR LOG MENU.
```


G.5.5 Exiting from the Error Log Menu

Select option 0 from the Error Log Menu to exit from the menu and return to the diagnostics diskette Main Menu.

G.6 Exiting from the Diagnostics Diskette

From the diagnostics diskette Main Menu, select option 0 to exit from the diagnostic programs. The following message is displayed:

```
EXIT DIAGNOSTICS function.

Insert a system diskette in drive A.

Press [ENTER] key to load the operating system.
Press [ESC] key to exit.
```

Remove the diagnostics diskette from drive A and replace it with your MS-DOS system diskette. Then press Enter to load MS-DOS.

System Configuration Record

In the spaces provided below, record all information relevant to your system's configuration. Fill out this record in pencil so that you can update it later on.

Date system was purchased: _____

Place of purchase: _____

Memory

Amount of main memory: _____

Amount of expansion memory: _____

Floppy Disk Drive(s)

Drive A

Type: 360 kilobyte double-sided

Drive B

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Fixed Disk Drive(s)

Drive C

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Drive D

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Display Unit(s) and Display Unit Adapter(s)

Color Display Unit

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Color Display Unit Adapter

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Monochrome Display Unit

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Monochrome Display Unit Adapter

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Printer(s)

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Additional Adapter Cards

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Installed in slot number: _____

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Installed in slot number: _____

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Installed in slot number: _____

Type: _____

Manufacturer: _____

Date purchased: _____

Place of purchase: _____

Installed in slot number: _____

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