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HOW TO USE THE APPLE® II & IIe

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Preface

This book was written for the Apple computer user who wants to learn quickly and conveniently the hows and whys of using the Apple IIe, the Apple II+, or the Apple II computer. Users of Apple "work-alike" computers — most notably the Franklin Ace and Orange Micro computers can also benefit from this book. Most of the information presented here is applicable equally to these work-alike computers.

This book is intended for the family, the teacher, the student, the hobbyist, or the business person who wants to make the best use of the Apple computer. It may serve as your first book on the Apple II computers, a primer that gets you started. It also can be useful as an introduction to practical applications of the Apple computer for any individual or group. We assume the reader has little prior experience with computing, but has a serious interest in getting the most from the Apple.

When you have finished this book, you should be able to comfortably operate your Apple, make informed decisions on selecting support products, establish your own computing priorities, and have a good basic knowledge of what the Apple computer can do.

CONTENTS

Chapter 1

Introduction

USING THIS BOOK

This book covers the Apple IIe, the Apple II+, and the Apple II computers. These three members of the Apple family are very similar but have some important differences that will be pointed out carefully and explained. **Unless specifically stated otherwise, all information presented applies equally to the Apple II, II+, and IIe.**

In Chapter 1, the basics of getting started with the Apple are covered. Nothing is taken for granted. The basic Apple is described, and there's information on setting up the computer, using the keyboard, and a review is given of the modes in which the Apple can operate.

Loading and saving programs is covered in Chapter 2. There is a review of the text and graphics features of the Apple Computer. Some easy-to-use sample programs also are included.

Popular accessories such as disk drives, printers, monitors, clocks, RAM cards, and speech synthesizers are reviewed in Chapter 3. Specific products with producers and prices are included to help you decide which of these fit your needs.

In Chapter 4, maintenance — an often neglected area — is covered to help you keep your Apple up and running and to save you costly repair and "down time."

Programming in the BASIC language is covered in Chapters 5 and 6. After finishing these chapters, you should be able to write simple programs in Applesoft BASIC, create both low- and high-resolution graphics, and understand a program printed in a magazine or book.

In Chapter 7, you are given a review of all of the most important uses for your Apple. A procedure for selecting software is provided and popular programs are described to help you make decisions on which ones you need.

Chapter 8 provides information on where you can learn more. Which magazines should you subscribe to? Which books should you buy? Where can you buy support products, and which clubs and meetings should you attend?

An Index helps you locate specific topics.

One approach to using this book is simply to read it through from beginning to end. As you read, take time to try out the techniques presented and experiment with the Apple computer whenever you find something that strikes your fancy.

You may prefer to skip certain parts. For example, if you already are a proficient programmer or have little interest in programming, you may wish to skip Chapters 5 and 6. Each chapter is largely independent of the others and may therefore be read in any order desired. Chapters which are not of interest to you may be omitted.

A LITTLE FAMILY HISTORY

The newest version of the basic Apple is the Apple IIe. The earlier Apple II+ and Apple II, which are no longer in production, are essentially the same machines with a few important differences. The differences and their implications will be pointed out shortly. The Apple III, the Apple Lisa, and the MacIntosh are different computers entirely and will not be covered in this book.

Apple Computer has adopted a philosophy of continuing to support earlier models of its computers when new models are placed in production. Compatibility is an important concept with Apple. This means that newer Apples also can run most of the programs written for older Apples.

The Apple IIe was released in early 1983 and is a much improved version of the basic Apple II line. It still looks much like the older IIs and II+s. The main additional features are a better keyboard, fewer chips inside, an enhanced ability to display uppercase and lowercase letters, and an expanded rear input and output panel. The IIe uses the same Applesoft BASIC language and operating system as the II+. Most of the accessories and programs designed originally for the Apple II+ or II will work just fine on the IIe.

There are two primary differences between the Apple II and II+. The first of these is the version of the BASIC programming language supplied with the two machines. The original Apple II came with a version of BASIC called Integer BASIC. It was so labeled because this language is not capable of doing decimal arithmetic (although there are other limits as

well). When the Apple II+ made its debut, an improved version of BASIC labeled Applesoft BASIC was included. The new version, developed for Apple by the Microsoft company, is a much expanded form of BASIC. It is sometimes referred to as "Floating-Point" or FP BASIC because it is capable of doing complex decimal arithmetic. The new FP, or Applesoft, BASIC is now available for the older IIs. Likewise, the earlier Integer BASIC can be easily added to the II+ so that programs written in this language can be run. (The Integer BASIC language is supplied on the "system master" disk which accompanies each Apple disk drive when it is purchased.)

The other major difference between the II and II+ is the "operating system." This is the program that controls the internal operations of the machine. The II+ is supplied with an improved operating system which is automatically activated when the computer is turned on. Either of the operating systems will operate with Integer or Applesoft BASIC.

The Macintosh is a transportable small computer which comes with 3½" disk drives and a built-in video monitor. This member of the Apple family was introduced in January 1984 and is designed for those who need a portable computer. The Mac's software may not be used on the Apple II's or III's but most will run on the Lisa.

The Apple III, in comparison to the Apple II line, is a more sophisticated, business-oriented machine. It has all of the capabilities of the II and II+, plus many others. The III will run most of the programs available for the IIs, but programs designed especially for the III are not directly transferable to the IIs. The Apple III is **not** intended as an updated version of the II or as a replacement for it.

The Lisa is even more sophisticated than the Apple III. It is so advanced that it is not directly compatible with any of the other Apples. The Lisa is a marvelous device intended for complex business applications. It is not an updated version of the IIs or the III. The Apple IIe, Apple III, Lisa , and Macintosh comprise the current product line for Apple Computer.

Your basic Apple is truly a marvelous and versatile little computer. More products, programs, and services are presently available for the Apple II, II+, and IIe than for any other small computer. Regardless of whether you are a business person, a hobbyist, or a teacher, you will find an abundance of uses for the Apple.

SET UP AND INSTALLATION

If you have just received your Apple or are just beginning to learn about it, a good starting point would be to review the main items which come

with the computer. The computer itself looks like a portable beige typewriter. If you have a disk drive unit, it is the rectangular box which will sit on top of or beside the computer. Several cables may accompany the

FIGURE 1.1 The Apple IIe computer.

computer. One will be a video cable for connecting the computer to a TV set or monitor. Disk drives have a short flat cable connected to them called a ribbon cable. You also will need a TV or video monitor.

Your Basic Apple

To get some idea of how your Apple works, we'll take a look at its core by removing the lid and checking out its insides. First, lift the lid on your Apple straight up from the back with both hands and look inside.

The Apple IIe and II+ look quite different inside. The IIe has fewer chips than the II+. You also will notice a red LED (light emitting diode) at the left rear of the IIe circuit board. The IIe looks like this inside:

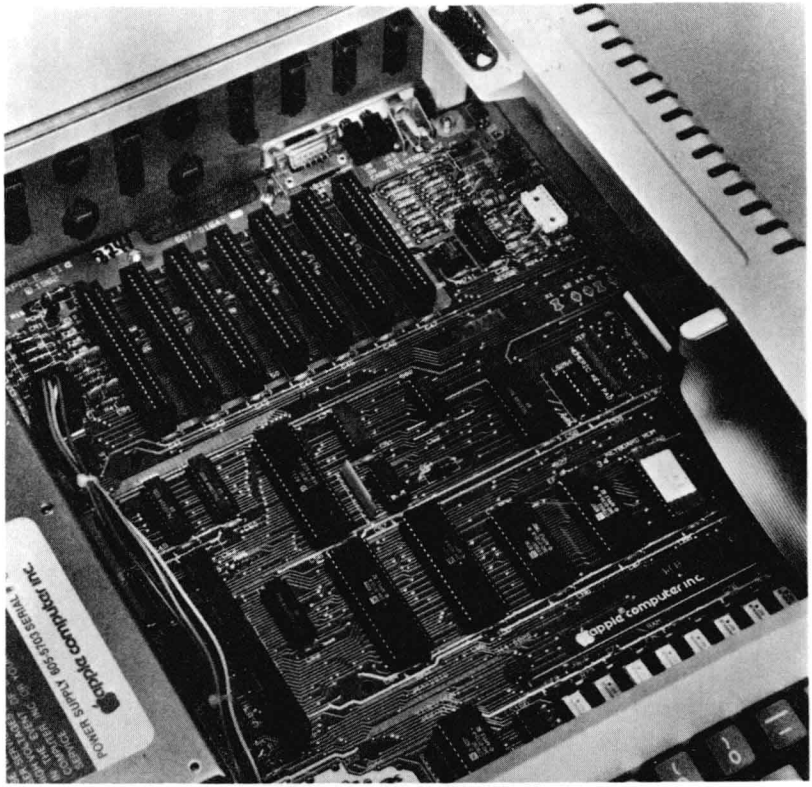

FIGURE 1.2 The Apple IIe motherboard.

A green circuit board called a "motherboard" can be seen inside the Apple. Numerous black rectangular chips are located on the motherboard. The largest of these is the microprocessor which has the number 6502 stamped on it. The 6502 chip is the heart of the Apple and processes all the information presented to your Apple computer by the programs you run.

If you look closely at the rows of smaller chips, you will notice some which are labeled ROM. These *read only memory* chips contain the BASIC programming language and the operating system. This information is permanently stored here, which means that you cannot delete or change it unless you program your Apple with a hammer. Several other rows of chips are labeled RAM. RAM stands for *random access memory*, and this is where your programs and data are stored while your Apple is in use. This area is wiped clean each time you turn off the computer or press

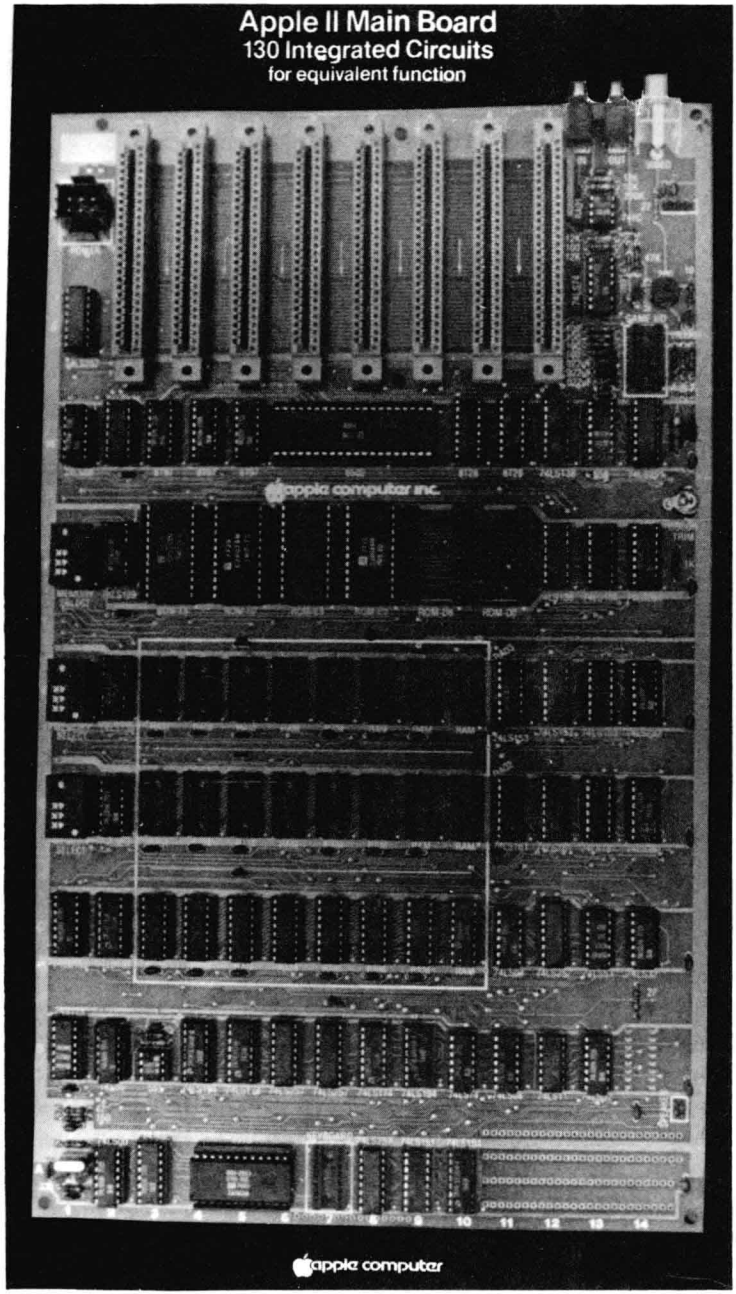

FIGURE 1.3 The Apple II+ motherboard.

the "reset" and the "control" keys together. At the back of the motherboard is a row of slots which are used to connect various devices such as printers and disk drives. The large "box" on the left side of the motherboard is the power supply. This provides the correct level of electrical current which the Apple needs to operate and filters out most electrical glitches and surges which can give computers fits.

On the right rear of the motherboard are several sockets for connection of various input and output devices. One is labeled "GAME I/O." This is where you connect your game controller paddles. The IIe also has a game I/O on the outside rear panel. Located near the game ports on the motherboard is a socket which is used to connect a "modulator." This is a device that lets you connect a standard TV to the computer.

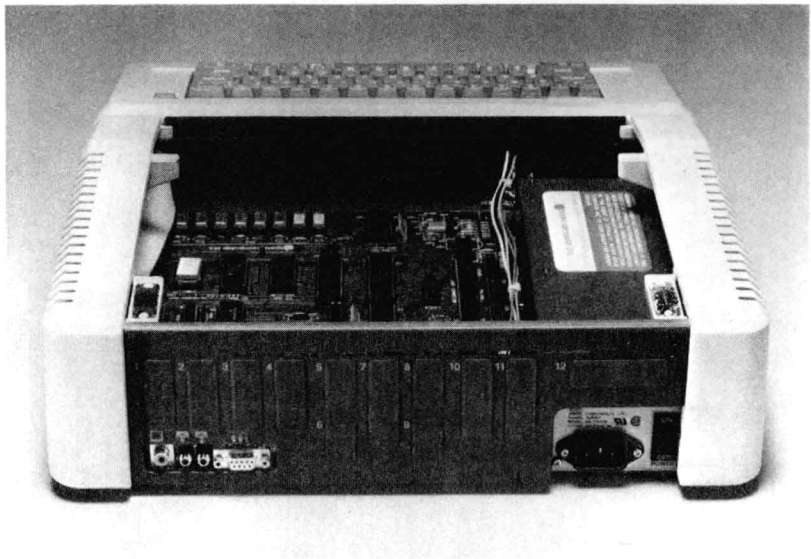

FIGURE 1.4 The rear panel of the Apple IIe.

On the rear panel of the computer is the video output port where you may connect the Apple to a video monitor. Next to this are two jacks (or ports) labeled simply *in* and *out*. These are the ports used to connect your Apple with a cassette tape recorder.

Your basic Apple is of little value without a means of viewing the input to and output from the computer and a means of loading and saving programs. You will need a small television set or video monitor to use with

your Apple and either a cassette recorder or disk drive unit on which to save your programs. You also may wish to connect a printer and game controllers (or paddles) at this time.

Making the Connections

As a safety precaution, turn off your Apple and unplug it before making any connections.

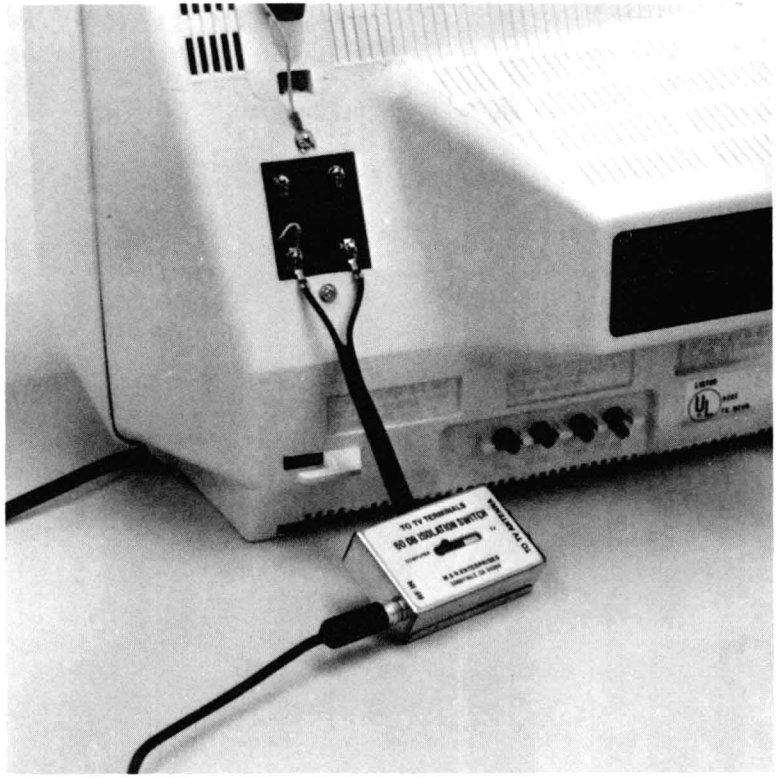

FIGURE 1.5 The T.V. connections.

Connecting the TV. If you have either a monochrome or color monitor, just plug it into the jack marked video on the back of the Apple with the supplied video cable shown in the photo. (A black-and-white set will work fine, but will not allow you to take advantage of the Apple's excellent color graphics.)

If you are using a regular TV set, you will need an item called an RF modulator. This plugs into the port (output connection) inside the Apple which was shown and described previously. The port is located on the rear right area of the motherboard. The same cable used with a monitor also can be used to connect the modulator to the antenna leads on your television. Most modulators sold for use with the Apple connect to the VHF antenna leads on your TV rather than the UHF leads and will operate on a VHF frequency such as channel 3 or 4. (If there is a station in your area operating on the same or an adjacent channel to the one on which your modulator operates, your TV may receive both signals and produce a garbled mess on the screen. If you have a UHF modulator, you can sometimes correct this by tuning your TV to the UHF channel which is double its normal broadcast frequency (channel 66 in the case of a channel 33 modulator) and using this as your "computer channel." VHF modulators operate on channels 2-13 and are generally less subject to interference from other channels.

You will need a 300 ohm to 75 ohm adapter to connect the antenna leads on your TV. This usually comes with the modulator when you purchase it. Connecting the Apple to your TV does not impair its ability to receive regular TV stations. To watch television instead of communicating with the computer, simply move the slide on the 300-75 ohm adapter to TV and switch the channel selector to the desired channel.

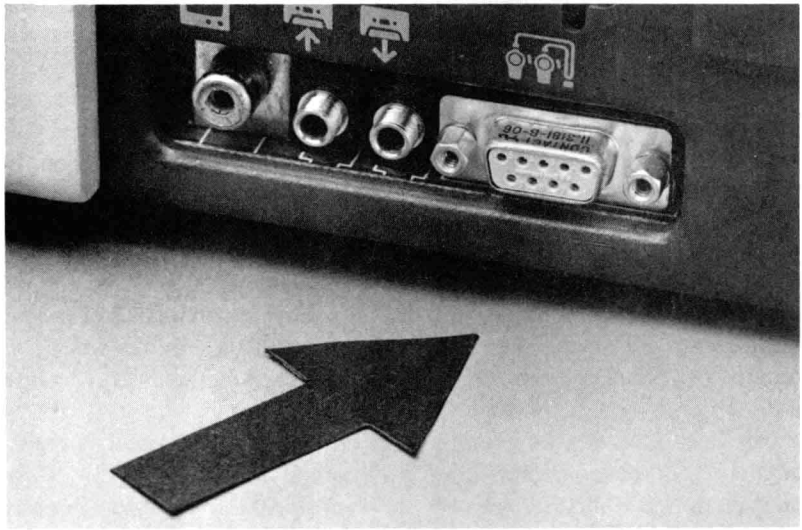

FIGURE 1.6 The paddle connections on the Apple IIe.

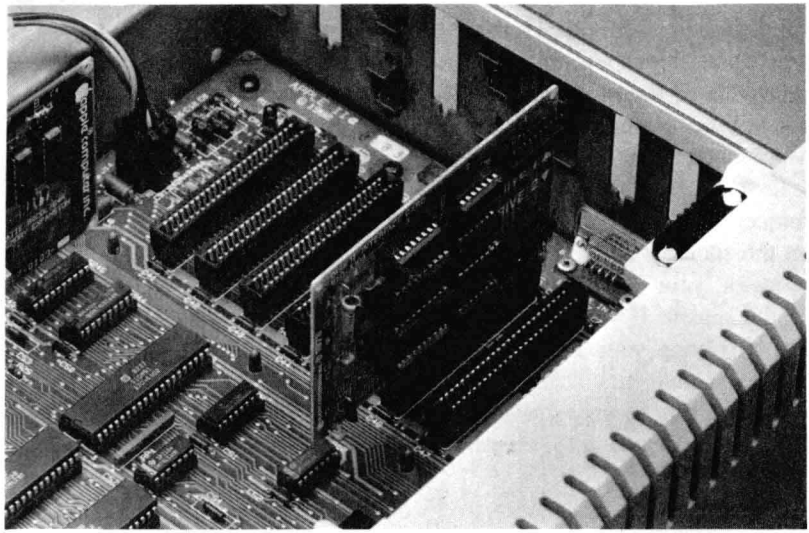

FIGURE 1.7 Disk controller card placement.

The Game Controllers. Game controllers, or paddles, come in a variety of types, which will be discussed in Chapter 3. These plug into the game I/O ports described earlier. The IIe has an accessible game port on the rear panel to connect your controllers. Just connect them as shown in the photo. To connect game controllers to the II+, you must remove the cover and plug them directly into the port on the motherboard. The pins on the plug are very small and can be bent easily. When making this connection, be very careful to make sure that all the little pins go into the socket. Some game controller plugs are marked with a white or colored dot on one end. Make sure this goes toward the front or keyboard end of the computer.

The Disk Drive. A disk drive is the only reliable means of storing and saving your programs. Many programs are available only on disks. The only other common means of storing and saving programs which can be used with the Apple is a cassette tape recorder.

The disk drive will be connected via one of the slots (usually slot six) at the back of the motherboard through a controller card and a cable. First, connect the flat ribbon-like cable to the controller card. The controller card can be used with one or two disk drives. If you have only one disk drive, connect the cable to the set of pins labeled Drive 1. Be very careful here to make certain that the little pins on the controller card are aligned properly

with the holes in the cable connection. If this is improperly connected, damage can result to the disk drive. The cable exits the connector **away from** the controller card. The other end of the cable should come firmly connected to the disk drive itself. If you are installing a second disk drive, it should be connected in the same manner to the set of pins labeled Drive 2.

To install the controller card, which you have connected to the disk drive via the ribbon cable, you simply plug the card into slot six, which is one place to the left of the right-most slot inside the Apple. Be certain to turn the power off before doing this! If the power is left on during removal or insertion of any card, serious damage can result to both the card and the computer. Insert the gold-colored fingers into the slot carefully. Some friction will be felt and the card should then seat firmly. Do not touch the gold fingers with your fingers. If you do, clean them with a soft cloth and alcohol before installing the card. Be sure the card seats evenly. Disk drives may be damaged by installing this card at an angle with the gold fingers of the card touching more than one connecting pin in the connector.

If you are using a II or II+, adjust the cable to lie flat as it passes out of the back of the computer as shown. When the lid is installed, it will clamp down on the cable and act as strain relief. If you have a IIe, the cables pass through one of the removable openings in the back of the

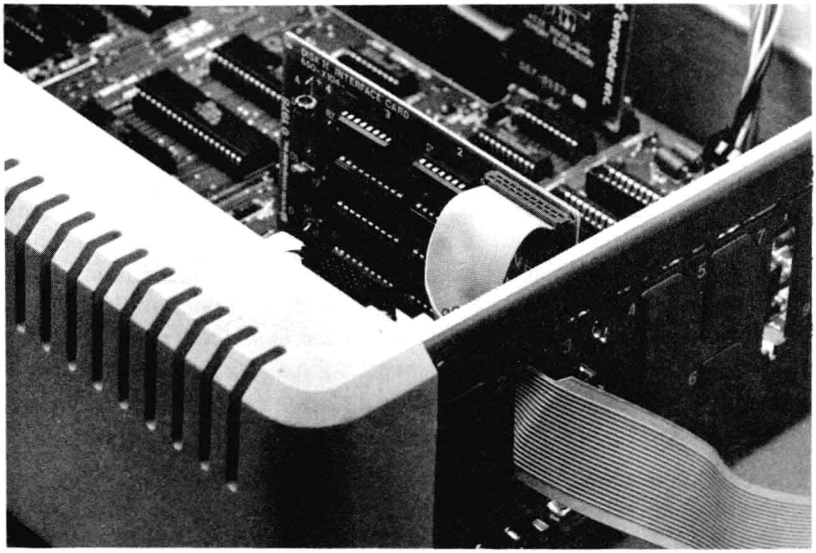

FIGURE 1.8 Disk drive cable placement.