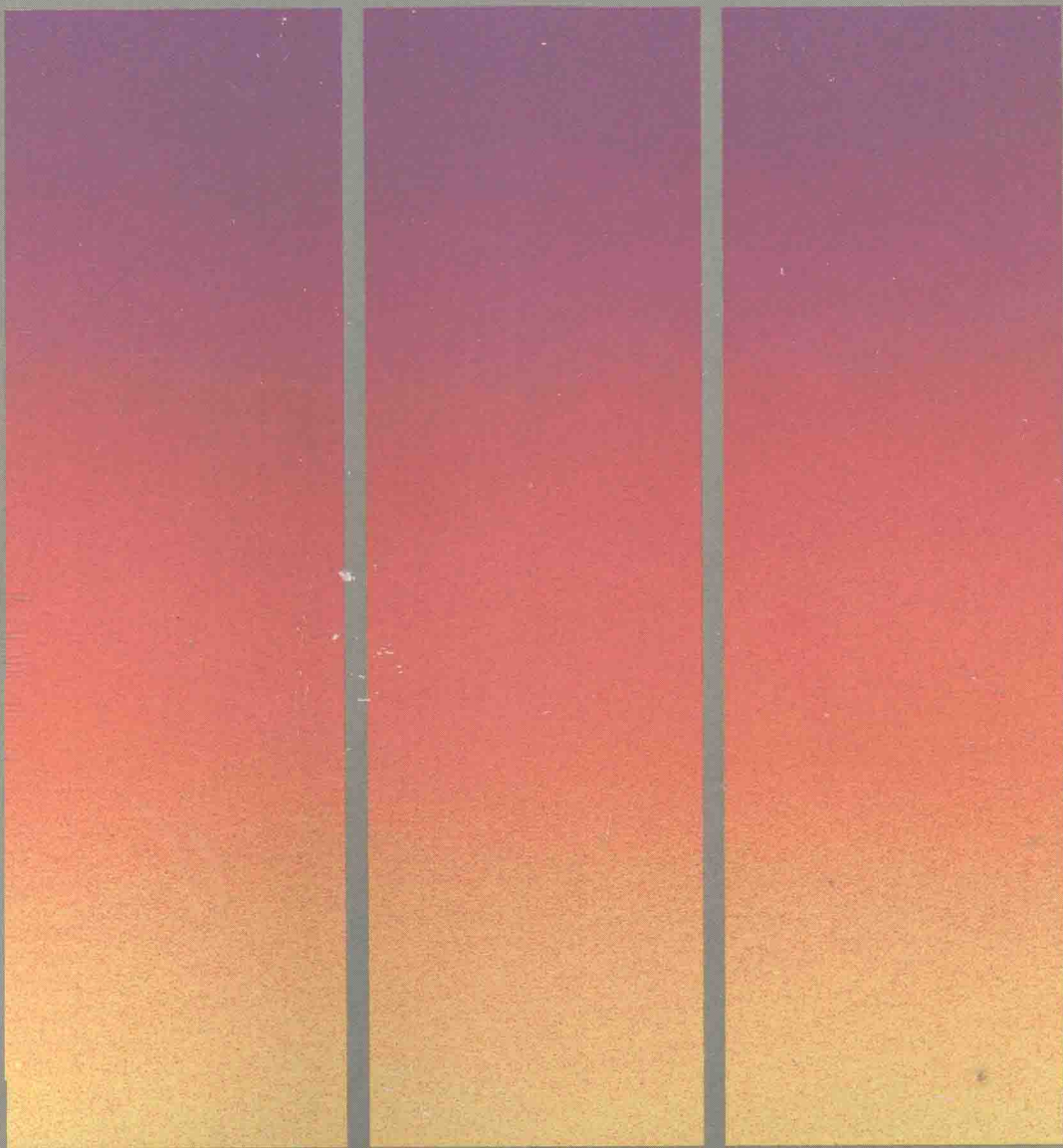


 Osborne/McGraw-Hill

THE OSBORNE/McGRAW-HILL GUIDE TO YOUR

Apple[®] III



Stanley M. Miaszkowski

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GUIDE TO YOUR

APPLE[®] III

Dedication

To my wife Kathe, without whose patience and assistance this book would never have been written.

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Introduction

The book you're holding in your hands is designed to be a *complete* guide to the Apple III personal computer system. The Apple III is a powerful and versatile system that is designed to handle the most involved tasks. For the first time, everything you need to know about setting up and using your Apple III is all in one place. There is no need to continually flip back and forth between numerous manuals.

The first two chapters are an overview of the Apple III and how to make it work. Chapter 1 is a detailed introduction to the system, including a look at the most popular accessories. Chapter 2 explains hooking up the system, getting started, and making backups of your software. It will also be useful to you if you purchase peripherals in the future.

Files are the means by which the Apple III stores and processes data and programs. Chapter 3 explains files, how they're handled, and how to use the Apple III System Utilities. disk.

The Apple III's sophisticated operating system (SOS) is one of the most powerful available in *any* personal computer. Chapter 4 introduces the SOS and goes into detail on how to use the System Configuration Program to customize the SOS to your particular system.

Chapters 5 and 6 are an introduction to Business BASIC, the Apple III's powerful and advanced BASIC interpreter. For people with little or no prior experience with BASIC, Chapter 5 explains the mechanics of using Business BASIC; Chapter 6 eases you into writing your own programs.

If you're an experience BASIC programmer, you can go directly to Chapters 7 and 8. Chapter 7 details the advanced features of Business BASIC that allow you to write professional programs for serious applications. Chapter 8 shows you how to create graphics and music with you Apple III.

The first three appendixes are a comprehensive reference to Business BASIC. Appendix A is a description of every statement and function available in Business BASIC. It's designed to serve as a handy reference once you become familiar with Business BASIC. Appendix B explains Business BASIC's error messages and what to do about them. Appendix C is a full list of Business BASIC's reserved words.

Appendix D covers the Apple III's system error messages, what they mean, and what to do about them. Appendix E is a complete guide to the console, including keyboard codes, cursor and console control keys, screen console codes, and cursor movement options.

Appendix F is a quick reference to creating graphics with your Apple III. It includes a summary of graphic procedures and functions, color codes, and graphics modes.

Appendix G is a summary of the parameters you need to hook up a printer. Appendix H provides detailed information on the Apple III's RS-232-C serial interface. Appendix I is a quick reference to creating music with your Apple III.

The Apple III can also run *Apple II* programs and use many Apple II peripherals. Appendix K details options and limitations of Apple II emulation.

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Introducing The Apple III

1

The Apple III personal computer is a sophisticated and versatile system. If you already own an Apple III, we don't have to convince you of this. However, whether you're already the proud owner of an Apple III or are seriously considering buying one, we suggest you read this chapter carefully. Whether the Apple III is your first personal computer or the latest in a series, this chapter is designed to give you a thorough background on the system's features and capabilities.

OVERVIEW OF THE SYSTEM

Figure 1-1 shows a basic Apple III system, including the system unit (the box with the keyboard, disk drive for floppy disks, and electronics) and the Apple Monitor III, a 12-inch video monitor (high-quality television screen).

Figure 1-2 is a picture of what might be considered a "loaded" system. To the basic system shown in Figure 1-1, a second, 5 1/4-inch floppy disk drive, a Profile hard disk (a special type of information storage peripheral that stores the equivalent of 35 floppy disks), a high-resolution RGB (red-green-blue) video display for showing eye-popping color graphics, and a printer have been added. (In this case, the printer is an Epson MX-80 F/T, although nearly any printer will work with the Apple III.)

Your Apple III system probably won't look exactly like either of these,



Figure 1-1. Basic Apple III system



Figure 1-2. Expanded Apple III system

since there are many ways to configure a system. The Apple III also comes with either 128K or 256K bytes (1K equals 1024) of programmable user memory called RAM, for random-access memory. This is where the computer stores programs to be run and the results of its calculations.

There are also four expansion slots inside the case where you plug in accessory circuit boards like controllers for the hard disk drive or a high-speed printer.

No matter how you've customized your system, there will be a number of common features. Of course, there is the Apple III itself, including the built-in keyboard, the floppy disk drive, and the video monitor. In this chapter, you'll get a close look at each of these, some common peripheral equipment, and the software needed to get the system up and running.

THE APPLE III KEYBOARD

Figure 1-3 is a close-up of the Apple III's keyboard. Although it looks like a separate unit, the 74-key keyboard is permanently attached to the main case. If you're an experienced typist, you'll find the Apple III's 61-key main keyboard familiar and comfortable; it's set up similar to a normal typewriter. If you're a touch typist, you'll immediately notice raised dots on the D and K keys to let you know where they are without having to look at the keyboard.

If you haven't used a computer keyboard before, you'll notice several keys that are new. **ESCAPE** and **CONTROL** are special keys you'll use often in the course of using the system. You will normally press **ESCAPE** followed by another key to initiate a command. Another common way to enter commands called control characters is to hold down the **CONTROL** key while typing another character. The use of **ESCAPE** and **CONTROL** depends on the program you are running.

There are also **OPEN APPLE** and **CLOSED APPLE** keys located on the lower left-hand side of the keyboard. They can be programmed to perform special functions that would normally take many keystrokes.

The four arrow keys on the lower right-hand side of the keyboard are used to control the *cursor*—the solid square that appears on your video display and tells you where you're working on the screen.

The majority of the character keys on the keyboard automatically repeat if they are held down for more than half a second. The arrow keys have two auto-repeat speeds. Touch them lightly and the cursor moves slowly; touch them harder and the cursor moves faster.



Figure 1-3. Close-up of the Apple III keyboard

A full 13-key calculator keyboard is included for applications where you'll be entering a good deal of numeric information. On the upper right-hand side of the keyboard is the **RESET** key that resets the entire system. (This is known as a *warm boot*.) With the Apple III, a two-key, fail-safe system has been added to make sure you don't accidentally reset the system. When you need to reset the system, you have to hold down the **CONTROL** key and press **RESET**.

FLOPPY DISK DRIVE

Immediately above the keyboard on the right side of the Apple III's main case is the built-in, 5 1/4-inch floppy disk drive (shown in Figure 1-4). This drive stores 140K (143,360) bytes of data on a standard miniature disk (the equivalent of about 35 pages of single-spaced, typed text.) This drive is used for loading the software to get the Apple III up and running—a process called *booting* the system. There are several options for increasing your system's disk storage capacity, which will be detailed later in this chapter.

REAR PANEL

If you're like most personal computer users, you'll find you want to expand your system as you go along. The Apple III makes it easy, since the connectors for the most commonly used accessories are built into the rear of the case. Figure 1-5 shows the Apple III's rear panel. Working from left to right, the connectors are

- A connector labeled **FLOPPY DISKS** for add-on, 5 1/4-inch floppy disk drives. As many as three additional drives can be added.

- A connector labeled COLOR VIDEO to which a color video monitor can be connected.
- A connector labeled B/W VIDEO for a black-and-white video display.
- A miniature phone jack labeled AUDIO for connecting an external speaker. (There's also a 2-inch speaker built into the main case.)
- A connector labeled PORT C to the built-in, RS-232-C serial interface. It's used for hooking up a modem (modulator/demodulator) so you can link your computer to other computers over telephone lines. You can also plug serial printers into it.
- A connector marked 120 VAC for connecting the Apple III to the power line.
- The ON/OFF switch for turning the Apple III on and off. The switch is located on the far right.

Notice the four vertical slots in the middle of the rear panel above the connectors. Behind the slots are places to plug in as many as four add-on circuit boards. (In Figure 1-5, two boards can be seen in the slots: a Profile hard disk interface and a parallel interface card for connecting a printer.)

VIDEO DISPLAY

Video monitor, video display, Cathode Ray Tube (CRT)—they're all different terms for what's essentially the same thing—a television screen for reading information (either text or graphics) from the computer. Although you can use a television set as a monitor for the Apple III, it's *not* recommended. A device called an *rf modulator* is required to convert the Apple III's video signal to a signal that a television set can use. The Apple III's high-quality video output requires a high-quality monitor designed specifically for computer use. Most television sets don't have the resolution or circuitry needed to display a full line of 80 characters or high-quality graphics.

Figure 1-6 shows the Apple Monitor III, a video monitor that is capable of displaying high-resolution graphics. It is available in either standard black-and-white or with a green phosphor (the coating on the inside face of the display screen). The green phosphor causes characters to be displayed as light green characters on a dark background and tends to be easier on your eyes. It's highly recommended that you buy the green display if you'll be using your Apple constantly. The Monitor

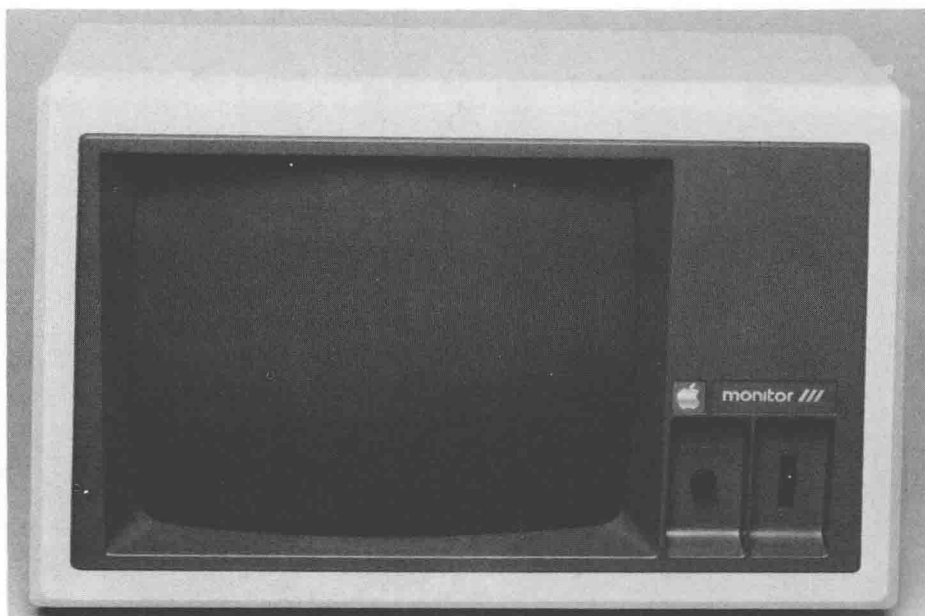


Figure 1-6. Apple Monitor III

III displays a sharp line of 80 characters and the Apple's highest-resolution graphics. If you don't want the Apple Monitor, which is designed to fit nicely on the top of the computer case with the Profile hard disk in between, there are numerous other monitors you can use.

To get the greatest use of the Apple III's outstanding color graphics, you should consider buying a high-resolution color monitor. Although Apple doesn't offer one, many brands are available. There are primarily two types: *composite video* and *RGB*. Composite video monitors are the less expensive of the two and offer high quality at a reasonable price. They can also be used as monitors for video cassette recorders and video games.

RGB (red-green-blue) monitors offer the ultimate in color quality with separate inputs for each of the three primary colors that make up a color television image. They normally can't be used for any other applications. Figure 1-7 shows a typical RGB monitor.

What's on the Screen

The Apple III can display characters and graphics (pictures) in a number of different ways. These displays are called *modes*. In addition,

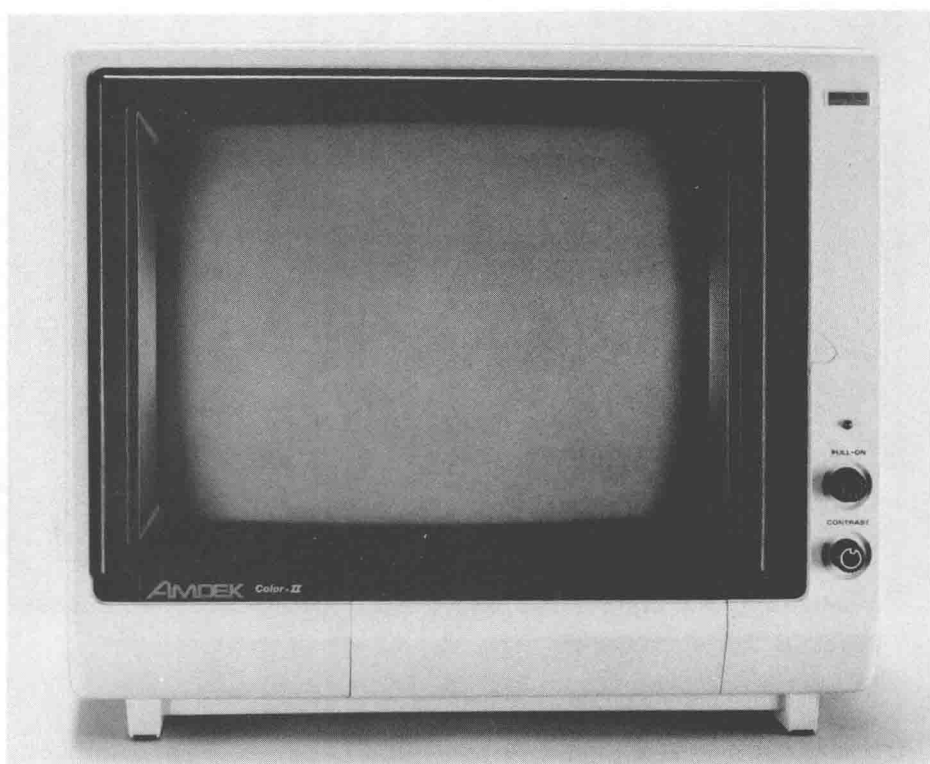


Figure 1-7. RGB color monitor

both upper- and lowercase letters can be displayed without using a special circuit board, making the Apple III ideal for word processing. The three text modes are

- 24 lines of 40 characters each in black-and-white.
- 24 lines of 80 characters each in black-and-white.
- 24 lines of 80 characters each using 16 colors in the foreground and background.

In each text mode, characters can be displayed in either normal or inverse video. Normal is light characters on a dark background, and inverse is dark characters on a light background. Most people find that normal video is the easiest to read and work with.

The Apple III also has four different modes for displaying graphic data (charts, graphs, and so on). Each graphic mode determines the number of pixels (picture elements or individual dots) that are on the