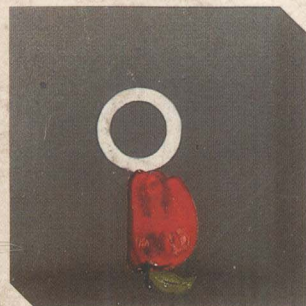
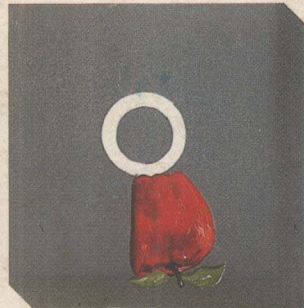
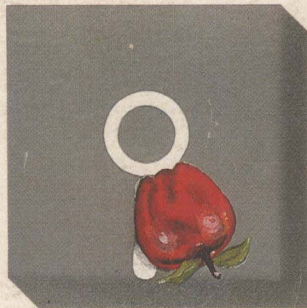
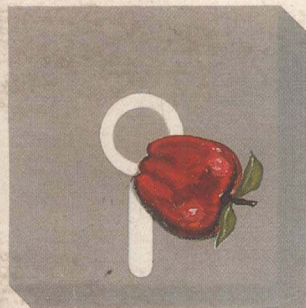
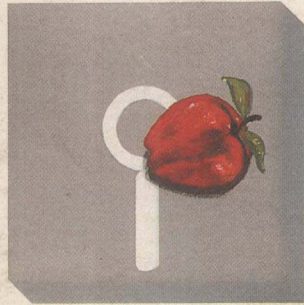
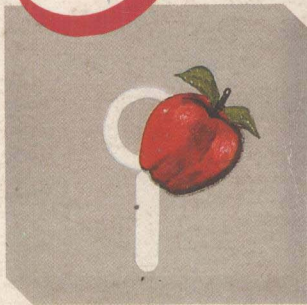
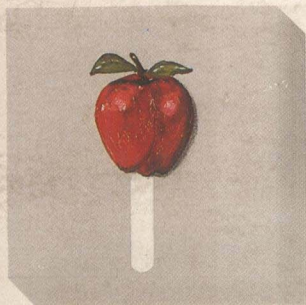


Apple[®] Files



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*As our lives are dedicated to the service of the Lord,
so also is this work.*

*"Whither thou goest..."
To Emmy—the best wife and proofreader ever.*

*"An Apple a day..."
To the Apple II—the only computer with personality.*

Apple IIe

There are several differences between the Apple II or II Plus and the Apple IIe that are of importance to IIe owners reading this book. The most obvious is the inclusion of lower-case display capability on the IIe. Older versions of the II did not have that built-in capability. For that reason, when Apple created its DOS and BASIC, lower-case DOS and BASIC commands were not allowed. To maintain compatibility, the IIe functions in the same way. Therefore, users of the IIe should place the computer in the CAPS LOCK position while programming. (An alternative for the experienced programmer is the "Restricted-case mode.") All programs in this book were created to recognize only upper-case. Unless modified, these programs should be run with the CAPS LOCK key engaged.

Older versions of the II came with a 40-character-per-line display. The IIe can easily be modified to display 80 characters per line. If such a modification is done, be certain to read the accompanying 80-Column Text Card manual carefully, and make note of any program suggestions included. The programs in this book are set up for a 40-character-per-line display but can easily be changed to take advantage of the 80-character-per-line capability.

If you have a IIe with the 80-Column Text Card, you must issue a PR#3 command to turn on the 80-column display. If you have turned on the 80-column display, the programs in this book must be changed wherever a PR# (n) command has been used. Most of these incidents occur when the output is to go to a printer. The following code steps should replace the Apple II and II Plus standard "PR#1-PR#0" code to activate and deactivate the printer for Apple IIe owners using the 80-column display. First, deactivate the 80-column card with PRINT CHR\$(21). Second, activate the printer with PRINT CHR\$(4);"PR#1". Third, when you are finished printing, deactivate the printer and reactivate the 80-column card

with `PRINT CHR$(4); "PR#3"`. Please remember, this change needs to be done only by Apple IIe owners using the 80-column card at the time they want to send output to another peripheral device such as a printer.

Knowledge of and familiarity with the keyboard are essential for error-free operation of just about every computer. The IIe is no exception. The IIe keyboard has more keys, a somewhat different placement of certain keys, and a different spelling of one key. Other versions of the II contain a key labeled CTRL. On the IIe, the same key is now spelled out as CONTROL.

When you are told in this book to type PR#6 or to turn the computer off and then back on, IIe users should, instead, press and hold the CONTROL and OPEN-APPLE keys, then press and release the RESET key. This sequence is known as a "COLD BOOT" and has the same effect as turning an older II off and then back on.

Each character key on the IIe keyboard has an auto repeat capability. This can be very helpful at certain times but at other times may cause some people problems. For instance, if a person presses the RETURN key for too long, more than one INPUT variable may be filled with what is called a "nul string" or simply no visible characters. In other words, the computer may think you have entered something when all you did was hold down the RETURN key too long. Such an action can cause errors in certain programs.

The Apple IIe has a slightly different slot arrangement. At the rear of the computer are seven slots numbered 1 thru 7, instead of the eight slots numbered 0 thru 7 on older Apple IIs. But the IIe has an 8th slot located on the left side toward the middle of the main logic board. In effect, this slot is a duplicate of slot 3 and is intended to contain Apple's 80-Column Text (or Text and memory) Card.

The standard cursor looks somewhat different on the IIe than on the other IIs. And depending upon the particular mode you are in, the cursor may be entirely different than any cursor on older Apple II computers. The IIe manual can best explain the purpose for the different shaped cursors.

As of this writing (February 1983), these are the known differences between the II and IIe versions that have any bearing on the material in this book.

Preface

The purpose of this book is to take some of the misery and mystery out of using Apple Computer's file structure. The book is aimed at people who know some BASIC and would like to learn to use the computer to assist them at home or at work by using the file capabilities of the Apple. *Apple Files* is designed as a step-by-step tutorial. The book explains some things that, without adequate manuals, take many painful hours of trial and error to learn. Progress has been made in creating better file-handling techniques on the Apple, and an explanation of some of these techniques is included.

Upon completion of the book, you should fully understand what files are and how to use them. You will be able to create your own sequential or random access files. Examples of both of these file types are included throughout the book. Program examples include file creation programs for: the stock market, mailing lists, inventories, grades, recipes, and medical records.

There are some very good data base programs available commercially. If your needs require an elaborate data base structure, you should probably use one of those programs or pay a programmer to create one for you. Reading this book will not make you capable of creating complete data base programs, but with practice, you will be able to effectively create and use any type of file you want.

I really enjoy programming and creating programs for my own use. I like the freedom programming gives me, because I can easily change or add to what the program does. I hope this book conveys some of that enjoyment and freedom.

Introduction

No book is magic in that, by possessing the book, you possess the knowledge of that book. Yet, I have tried to make it relatively easy for *anyone* to learn to use the Apple computer.

No single book will suffice for everyone, and this book makes no claim to being the exception. Nevertheless, I have attempted to make it useful for the beginner as well as the more experienced Apple user. In answer to the often-asked question, "What can I do with it besides play games?" the program examples cover the areas of home, education, business, hobby, or investment.

Computer vocabulary has been introduced very gradually. Readers somewhat knowledgeable about the vocabulary may find the process repetitious at first, but I have found this to be the best method for acquiring a working knowledge of the multitude of "jargon."

The "system" approach has been used so the reader would not be overwhelmed with a large number of different application programs. The programs presented are intended to be useful as well as instructive. The programs build upon themselves so that something that may appear awkward to an experienced programmer is used to help explain a concept needed in later chapters.

Information for the more experienced Apple user includes a thorough discussion of the "B" parameter with random access and sequential files. Other items are: EXEC files, tape files, Binary files, DIF files with application programs, and RWTS. The section on Tape files briefly explains how this book can be useful to someone without a disk drive.

You cannot just absorb this information. You must read the book and plan to re-read and/or study the text and programs of parts that are at first unclear. Invest time in learning how to get the most out of the Apple. Experienced Apple users may find that they can either skip parts

or proceed quickly through certain sections. I would encourage everyone to finish the book.

Finally, a disk containing all the programs presented in the book will be available. You can make the disk yourself by typing in all the programs, but if you just want to see the programs in operation, then you may want to purchase the disk. I sincerely hope you enjoy the book and find it instructive.

The programs in this book are available on disk with additional documentation and suggestions. To order your copy, please send \$15.00 (\$17.50 outside North America) to:
AEN, 9525 Lucerne Street, Ventura, CA 93004.
California residents, add 6% sales tax.

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I

Apple's Four File Types

There are as many definitions of the word file as there are kinds of files. You can quickly become confused if your understanding of the term differs from an author's intended use, and dictionary definitions are of little use in the computer world of today. Before becoming involved with the computer, my understanding of a file was limited to information that was kept in a folder in a file cabinet. I think we often learn best by trying to fit that which is new into something we already understand. Therefore, following this idea, I will try to explain Apple® file structure in terms of a file cabinet.

In a four-drawer file cabinet, one drawer might be for accounts payable, while another could be for accounts receivable, a third for personnel information, and the fourth for inventory information. These are used only as examples to show that each drawer might contain different file types. The file cabinet just as easily can contain game instructions in one drawer, receipts in another, name and address information in a third, and medical records in the fourth. The idea is of four drawers containing four different types of information. *The Apple's file cabinet (the disk and diskette) is mainly a four-drawer cabinet.* (Actually Apple has eight possible file types, but only four are usually used.) The first drawer or type of file contains Applesoft BASIC program files and is marked with an "A". The second drawer contains Integer BASIC program files and is marked with an "I". The third holds binary information and is marked with a "B", and the fourth (and the one we will look at in detail in this book) holds text information and is marked with a "T". Therefore, each diskette you use is like that four-drawer file cabinet. It is set up to accept information

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in any of these drawers, but it does not have to have information in all of them—just like the real filing cabinet doesn't have to have something in all four drawers. If you never have any binary, or B, information, you are not required to have B files on your diskette. Some diskettes may not show some of the four file types.

How do you know what files are on your diskettes? We will begin the tutorial part of this book by going through all the steps necessary in order to find out just what files are on your diskette. (If you are already acquainted with the procedure used to start up the computer and disk drive—sometimes called “booting the system”—you can skip the rest of this paragraph.) Take your SYSTEM MASTER Diskette (or almost any other diskette), and insert it into the disk drive. (If you have more than one drive, make sure to put the diskette into drive one.) Then do one of the following: (1) Turn on the computer, or (2) If the computer is already on, type PR# 6 (or whatever slot number your disk interface card is in) and press the key marked RETURN, or (3) Turn the computer off and back on again. The disk drive should make some noise, and the IN USE light on the disk drive should come on. If you have not already shut the disk drive door, shut it carefully at this time. Soon the disk drive will stop, the IN USE light will go out, and there should be a blinking box somewhere on the screen. (If you have not been able to get to this point with the computer, try another diskette, preferably the diskette marked “SYSTEM MASTER”. If switching diskettes does not work, you will need to check the manuals for your particular system.)

Now, type CATALOG and press the key marked RETURN. The disk drive will come back on and you will see a list with three things on each line of text:

1. a single letter,
2. a three digit number, and
3. a name made up of letters and/or numbers.

The single letter tells what type of file it is: usually either an A, B, I, or T. The three digit number gives the size of the file, which we will discuss in more detail later. The name, consisting of letters and/or possibly numbers, is the actual name of the specific file. In our file cabinet example, this is the same information that might appear on each folder. You might label each folder with (1) a single letter indicating which drawer it goes in, (2) how much information it contains, and (3) a name for the information within the folder. If you were able to see all the names of the folders in the four-drawer file cabinet, all of the A type files would be together, as would the B, then I, and finally T type files. In reality, most file cabinets do not have a list of all the files stored within them. It would be a time-consuming job to update that list every time you added, changed or threw away a file, but Apple's file manager system does just that and does it automatically. That list of everything in the file cabinet (on the

diskette is what you get when you type CATALOG. *Typing CATALOG shows the list previously created by the file management system.* Since it doesn't much matter to the disk where the information is stored, an A file may be followed by a T file, followed by another A file or B file or I file or another T file. In other words, the list of the files on the disk is not separated by file type. Instead, usually the list (CATALOG) shows the order in which the files are created.

How are these files used? By now you know the four main file types used by Apple, but you don't know much about them. What are they? How are they different? How are they used? Returning to the four-drawer file cabinet, the person in charge of that cabinet might put some rules or locks on the drawers. In other words, he or she might say that the A type file could be used only in a certain way or only by certain people. The same could be true of the other file types or drawers. This is exactly what Apple's file management system has done. Each file type is used differently and can be used only in certain specific ways. *A and I files are instructions (also called programs) to the computer to do something.* Examples of such instructions would be:

```
20 HOME
40 DIM X$ (30)
50 GOTO 100
100 PRINT "HELLO"
```

Most T files are not computer instructions but contain information of value to people such as names, addresses, zip codes, payroll deductions, pay rates, and book titles. Often T files are just lists of such information. Such lists, of course, would not make sense as instructions to the computer which is the reason T files cannot be RUN like A or I files (programs) can be. *Binary files can be either computer instructions or human information (lists), or sometimes a combination of both.*

It should be clear that Apple files are used to store information just as you or I use a filing cabinet, that there are different types of files and that they are used for different purposes. In the next chapter, we will look more closely at the four file types and how they are used. In subsequent chapters, we will look inside the drawer of one of those file types, the T file, and examine how information is kept, how that information is used, and how those files are created. The latter, creating files, is the main emphasis of this book and will occupy the remaining chapters. If you want to know how to create the A or I files (programs), you will need to learn "programming." Effectively using the T files requires some knowledge of how to program in either Applesoft or Integer BASIC. The programs discussed in this book will, for the most part, be Applesoft BASIC programs, and the discussion will be such that anyone willing to try the examples should learn to program as well as learn to create and use

T files. In other words, although the main emphasis of this book is on the T files, you will learn a certain amount of programming---A or I BASIC program files, in order to be able to create, display and change T files. And I repeat, *anyone willing to try all the examples, and read carefully through the discussion of the examples, can and will learn to program and thus make effective use of the T files.* Individuals, no matter what their age, background or experience, can learn the information presented in this book. Programming and file manipulation are a matter of learning how to give instructions to the computer in a manner the computer can understand, or, more simply, programming is learning how to talk to the computer and tell it what you want it to do.

QUESTIONS

1. How many main file types does Apple have?
2. What letter is used in the CATALOG of a diskette for Integer files?
3. What is a "B" file?
4. Which file type will this book concentrate on?
5. What word would you need to type in order to see a list of the files on a diskette?
6. Which files contain instructions to the computer? *A, I*
7. Which files contain information of value to people?
8. Which file can contain information of use to both computers and people? *B*

ANSWERS

1. 4
2. I
3. BINARY
4. T or TEXT
5. CATALOG
6. A and I
7. T and B (Programmers aren't human!)
8. BINARY or B