32 BASIC PROGRAMS FOR THE APPLE COMPUTER

Tom Rugg

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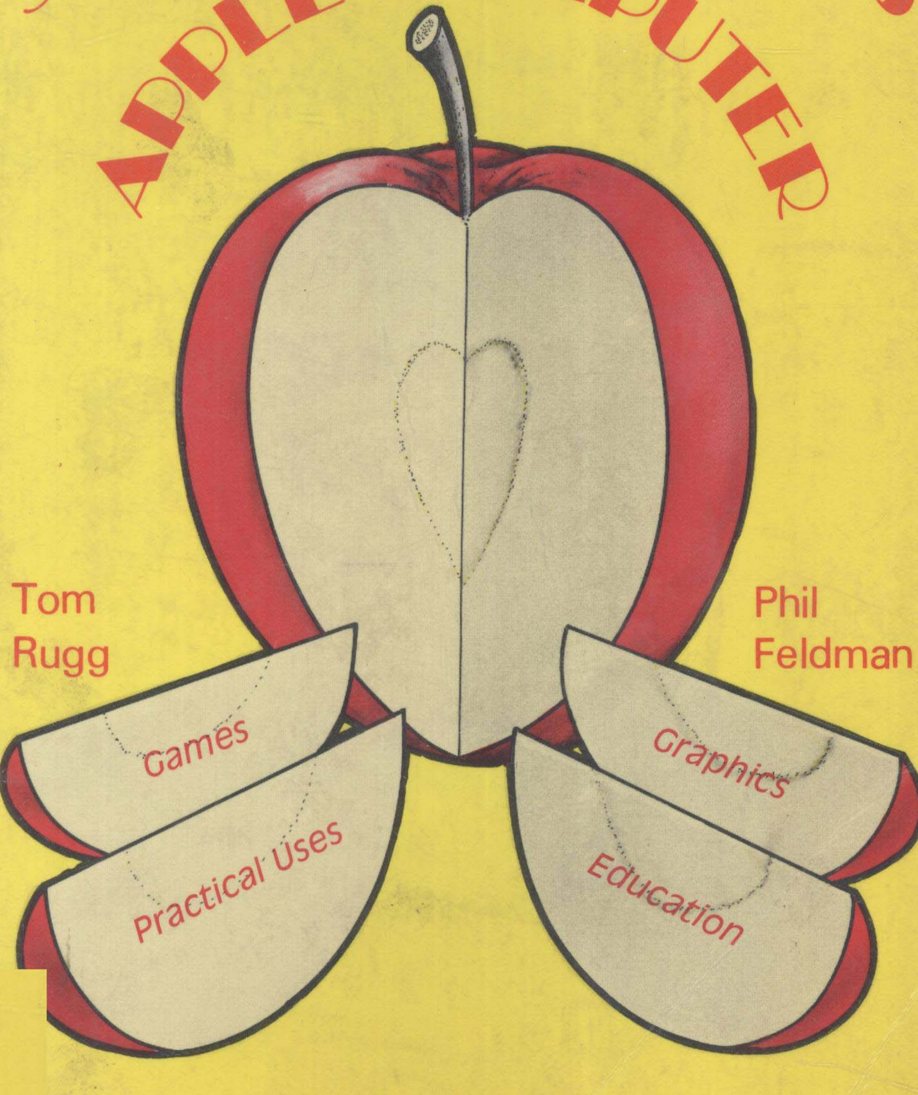

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AN IMPORTANT NOTE

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Preface

You have bought yourself an Apple computer (or maybe you just have access to one at school or work). You will soon find that the most frequent question you are asked goes something like this: "Oh, you got a computer, eh? Uh . . . what are you going to do with it?"

Your answer, of course, depends on your own particular situation. Maybe you got it for mathematical work, or for your business, or for home usage, or to enable you to learn more about computers. Maybe you got it for a teaching/learning tool or for playing games.

Even if you got the computer specifically for only one of these reasons, you should not neglect the others. The computer is such a powerful tool that it can be used in many different ways. If it is not being used for its "intended" function right now, why not make use of it in some other way?

The Apple is so small and portable that you can, say, take it home from work over the weekend and let the kids play educational games. They will have fun *and* learn a lot. After they go to bed, you can use it to help plan your personal finances. Or, you can let your guests at a party try to outsmart the Apple (or each other) at some fascinating games. The possibilities go on and on.

All these things can be done with the Apple, but it cannot do any of them without the key ingredient– a computer program. People with little or no exposure to computers may be in for a surprise when they learn this. A computer without a program is like a car without a driver. It just sits there.

So you ask, "Where can I get some programs to do the things I want my computer to do?" Glad you asked. There are several alternatives.

1. Hire a computer programmer. If you have a big budget, this is the way to go. Good programmers are expensive and hard to find (and you will not know for sure if they're really good until after the job is finished). Writing a couple of programs that are moderately complex will probably cost you more than you paid for the Apple itself.
2. Learn to program yourself. This is a nice alternative, but it takes time. There are lots of programming books available—some are good, some not so good. You can take courses at local colleges. If you can afford the time and you have a fair amount of common sense and inner drive, this is a good solution.
3. Buy the programs you want. This is cheaper than hiring your own programmer because all the buyers share the cost of writing the programs. You still will not find it very cheap, especially if you·want to accumulate several dozen programs. Each program might cost anywhere from a few dollars to several hundred dollars. The main problem is that you cannot be sure how good the programs are, and, since they are generalized for all possible buyers, you may not be able to easily modify them to do exactly what *you* want. Also, they have to be written in a computer language that *your* computer understands. Even if you find a program written in the BASIC language, you will soon learn that the Apple's BASIC is not the same as other versions. Variations between versions of the same language typically result in the program not working.

This book gives you the chance to take the third alternative at the lowest possible cost. If you divide the cost of the book by the number of programs in it (use your computer if you like), you will find that the cost per program is amazingly low. Even if there are only a few programs in the book that will be useful to you, the cost is pretty hard to beat.

Just as important is the fact that these programs are written specifically for your Apple. If you type them in exactly as shown, they will work! No changes are needed. In addition, we show you exactly what to change in order to make some simple modifications that may suit your taste or needs. Plus, if you have learned a little about BASIC, you can go even further and follow the suggestions about more extensive changes that can be made. This approach was used to try to make every program useful to you, whether you are a total beginner or an old hand with computers.

But enough of the sales pitch. Our main point is that we feel a computer is an incredibly flexible machine, and it is a shame to put it to only one or two limited uses and let it sit idle the rest of the time. We are giving you a pretty wide range of things to do with your Apple, and we are really only scratching the surface.

So open your eyes and your mind. Play a mental game against the computer (WARI, JOT). Evaluate your next financial decision (LOAN, DECIDE). Expand your vocabulary or improve your reading speed (VOCAB, TACHIST). Solve mathematical equations (DIFFEQN, SIMEQN).

But please, don't leave your Apple asleep in the corner too much. Give it some exercise.

How to Use This Book

Each chapter of this book presents a computer program that runs on an Apple II or Apple III computer with Applesoft BASIC. Most will run on a 16K Apple II (see Appendix 1). Each chapter is made up of eight sections that serve the following functions:

1. **Purpose**: Explains what the program does and why you might want to use it.
2. **How To Use It**: Gives the details of what happens when you run the program. Explains your options and the meanings of any responses you might give. Provides details of any limitations of the program or errors that might occur.
3. **Sample Run**: Shows you what you will see on the screen when you run the program.
4. **Program Listing**: Provides a "listing" (or "print-out") of the BASIC program. These are the instructions to the computer that you must provide so it will know what to do. You must type them in extremely carefully for correct results.
5. **Easy Changes**: Shows you some very simple changes you can make to the program to cause it to work differently, if you wish. You do not have to understand how to program to make these changes.
6. **Main Routines**: Explains the general logic of the program, in case you want to figure out how it works. Gives the BASIC line numbers and a brief explanation of what each major portion of the program accomplishes.
7. **Main Variables**: Explains what each of the key variables in the program is used for, in case you want to figure out how it works.

8. **Suggested Projects**: Provides a few ideas for major changes you might want to make to the program. To try any of these, you will need to understand BASIC and use the information provided in the previous two sections (Main Routines and Main Variables).

To use any of these programs on your Apple computer, you need only use the first four sections. The last four sections are there to give you supplementary information if you want to tinker with the program.

RECOMMENDED PROCEDURE

Here is our recommendation of how to try any of the programs in this book:

1. Read through the documentation that came with the Apple to learn the fundamentals of communication with the computer. This will teach you how to turn the computer on, get into Applesoft, enter a program, correct mistakes, run a program, etc.
2. Pick a chapter and read Section 1 ("Purpose") to see if the program sounds interesting or useful to you. If not, move on to the next chapter until you find one that is. If you are a beginner you might want to try one of the short "Miscellaneous Programs" first.
3. Read Sections 2 and 3 of the chapter ("How To Use It" and "Sample Run") to learn the details of what the program does.
4. Enter the NEW command to eliminate any existing program that might already be in your Apple's memory. Using Section 4 of the chapter ("Program Listing"), carefully enter the program into the Apple. Be particularly careful to get all the punctuation characters right (i.e., commas, semicolons, colons, quotation marks, etc.).
5. *After the entire program is entered into the Apple's memory, use the LIST command to display what you have entered so you can double check for typographical errors, omitted lines, etc.* Don't mistake a semicolon for a colon, or an alphabetic I or O for a numeric 1 or 0 (zero). Take a minute to note the differences in these characters before you begin.

6. Before trying to RUN the program, use the SAVE command to save the program temporarily on cassette or disk. This could prevent a lot of wasted effort in case something goes wrong (power failure, computer malfunction, etc.).
7. Now RUN the program. Is the same thing happening that is shown in the Sample Run? If so, accept our congratulations and go on to step 9. If not, stay cool and go to step 8.
8. If you got a SYNTAX ERROR in a line, LIST that line and look at it closely. Something is not right. Maybe you interchanged a colon and a semicolon. Maybe you typed a numeric 1 or 0 instead of an alphabetic I or O. Maybe you misspelled a word or omitted one. Keep looking until you find it, then correct the error and go back to step 7.

   If you got some other kind of error message, consult the Apple documentation for an explanation. Keep in mind that the error might not be in the line that is pointed to by the error message. It is not unusual for the mistake to be in a line immediately preceding the error message line. Another possibility is that one or more lines were omitted entirely. In any event, fix the problem and go back to step 7.

   If there are no error messages, but the program is not doing the same thing as the Sample Run, there are two possibilities. First, maybe the program isn't *supposed* to do exactly the same thing. Some of the programs are designed to do unpredictable things to avoid repetition (primarily the game programs and graphic displays). They should be doing the same *types* of things as the Sample Run, however.

   The second possibility is that you made a typing error that did not cause an error message to be displayed, but simply changed the meaning of one or more lines in the program. These are a little tricky to find, but you can usually narrow it down to the general area of the problem by noting the point at which the error takes place. Is the first thing displayed correct? If so, the error is probably after the PRINT statement that caused the first thing to be displayed. Look for the same types of things mentioned before. Make the corrections and go back to step 7.
9. Continue running the program, trying to duplicate the Sample Run. If you find a variation that cannot be accounted for in the "How To Use It" section of the chapter, go to step 8.

Otherwise, if it seems to be running properly, SAVE the program on cassette or disk.

10. Read Section 5 of the chapter ("Easy Changes"). Try any of the changes that look interesting. If you think the changed version is better, SAVE it on cassette or disk, too. You will probably want to give it a slightly different title in the first REM statement to avoid future confusion.

A NOTE ON THE PROGRAM LISTINGS

A line on the screen of the Apple is 40 characters wide, The printer that was used to create the Program Listing section of each chapter prints lines up to 80 characters long. For best reproduction in this book, it was preferable that each published line be no longer than 56 characters. This combination of facts might cause you a little confusion when you are entering the programs into your Apple. Here's the way it works.

Wherever there is a line in a program that is longer than 56 characters, it has been divided into two lines that are each no more than 56 characters. You can recognize this easily because the second part has no line number at the left-hand side. This division is only for the purpose of printing the book. You should think of a divided line like this as one long line and enter it into your Apple as a single line. Usually, this division is made in such a way that the first part of the line ends with a colon or semicolon so you can notice it more easily.

Don't be fooled by the fact that the cursor on your Apple jumps down to the next line after you enter the 40th character —it's just one long line until you press **RETURN**.

Also, you should be aware that Applesoft "reformats" each line of your program when you LIST it by adding extra spaces. To improve readability and shorten the listings, the listings in this book are formatted without most of these spaces. You should key in each program as it is shown here, but be aware that Applesoft will add spaces when you LIST it. *The only places where it is critical that the number of spaces be the same are between quotation marks and in DATA statements.*

Contents

Section 6—MISCELLANEOUS PROGRAMS

Short programs that do interesting things.

Section 1

Applications Programs

INTRODUCTION TO APPLICATIONS PROGRAMS

Good practical applications are certainly a prime use of personal computers. There are a myriad of ways the Apple can help us to do useful work. Here are six programs for use around the home or business.

Financial considerations are always important. LOAN will calculate interest, payment schedules, etc. for mortgages, car loans, or any such business loan. Do you every have trouble balancing your checkbook(s)? CHECKBOOK will enable you to rectify your monthly statements and help you find the cause of any errors.

Fuel usage is a constant concern for those of us who drive. MILEAGE will determine and keep track of a motor vehicle's general operating efficiency.

The tedium of analyzing questionnaires and examinations can be greatly relieved with the aid of your computer. In particular, teachers and market researchers should find QUEST/EXAM useful.

Often we are faced with difficult decisions. DECIDE transforms the Apple into a trusty advisor. Help will be at hand for any decision involving the selection of one alternative from several choices.

Before anything else, you might want to consult BIORHYTHM each day. Some major airlines, and other industries, are placing credence on biorhythm theory. If you agree, or "just in case," simply turn on your Apple and load this program.