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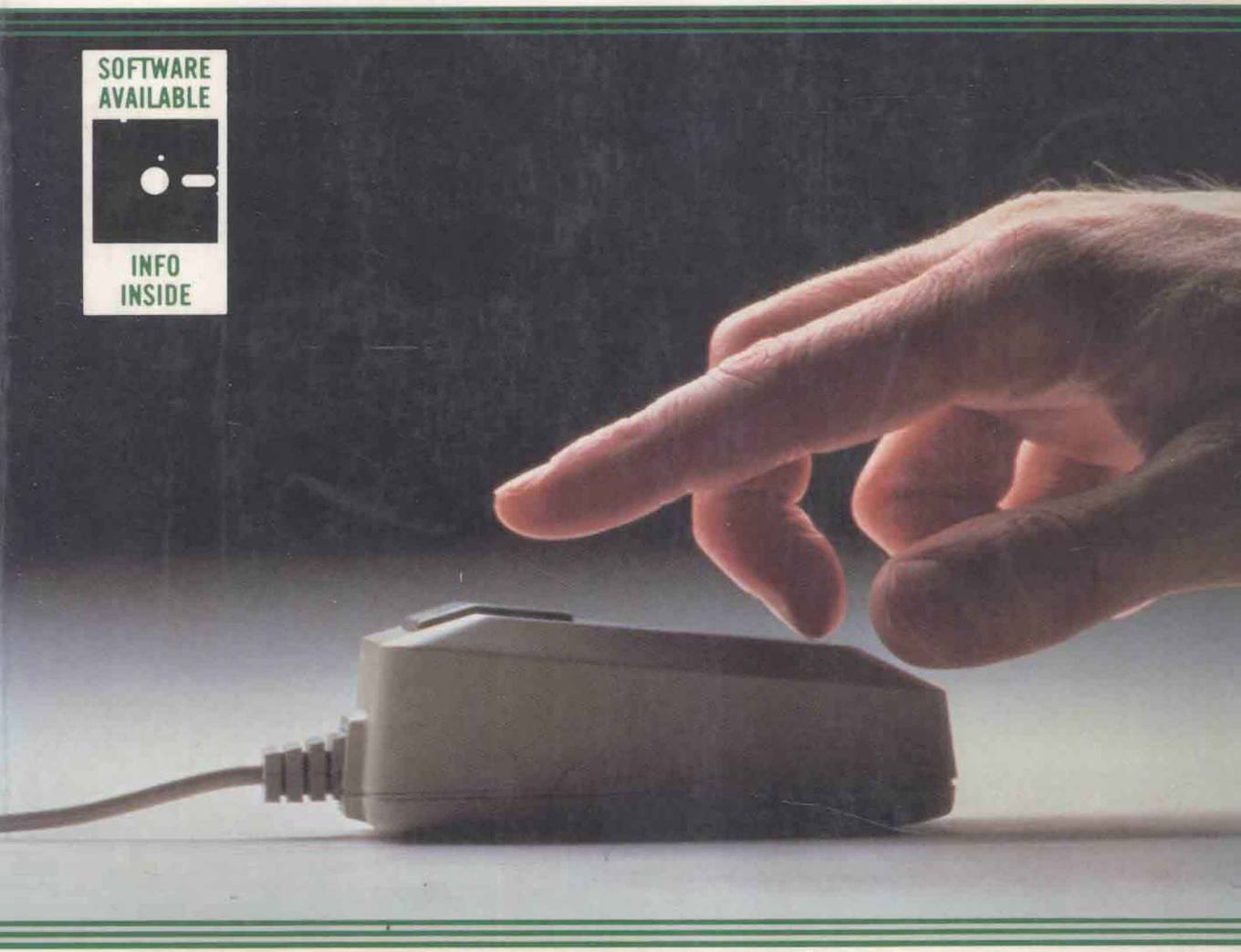
MACINTOSH™ PROGRAMMING USING MS-BASIC™ 2.0



RICHARD C. VILE, JR.

MACINTOSH™ PROGRAMMING USING MS-BASIC™ 2.0

RICHARD C. VILE, JR.

TAB TAB BOOKS Inc.
Blue Ridge Summit, PA 17214

To my parents with love and appreciation.

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Program Titles

Program 3-1	Menu Trainer
Program 4-1	Menu Maze
Program 5-1	Prototype Menu Handler
Program 6-1	Pretty Flashy
Program 7-1	Window Trainer
Program 8-1	Elevator
Program 9-1	Pattern Maker
Program 10-1	Address Book Entry
Program 11-1	Click to Continue Subroutine
Program 11-2	Crosshairs
Program 11-3	Flying Crosshairs
Program 11-4	Mouse Inside Rectangle Subroutine
Program 11-5	Drag Open a Rectangle
Program 12-1	Quickdraw Trainer
Program 13-1	Scribble or Random Neckties
Program 13-2	Video
Program 14-1	Rose Patterns
Program 15-1	Ups 'N Downs
Program 16-1	Fancy MOUSE (0)
Program 17-1	Help File Generator
Program 18-1	Help File Support
Program 20-1	Windows With One-Pixel Borders
Program 22-1	Cursor Editor

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Program 23-1 Mouse Kaleidoscope
Program 24-1 Vocabulary Quiz
Program 25-1 Dialog Design (Startup Program)
Program 25-2 Dialog Boxes
Program 25-3 Generated Basic for Print Setup
Program 25-4 Generated Basic for Print . . .
Program 27-1 Changing Cursors
Program 27-2 Double Click Analyzer

Introduction

This book tells you how to write Interactive programs on the Macintosh using Microsoft BASIC 2.0. It assumes that you already know or are rapidly learning BASIC. The emphasis is on using the interactive features of the Macintosh: menus, graphics, buttons, edit fields, the mouse, and so on. It contains over 20 programs designed to illustrate these topics in as much depth as the thickness of the book will allow.

THE ORGANIZATION OF THE BOOK

The book is divided into five sections:

Section One:	Getting Started
Section Two:	Learning the Ropes
Section Three	A Programmer's Notebook
Section Four	Applications
Section Five	Keeping at It

Each section begins with a brief introduction explaining the contents and use of the section.

Section One discusses MS-BASIC on the Macintosh and how to use the book.

Section Two consists of 16 chapters containing sample programs that demonstrate features and techniques. The emphasis is on the interactive programming features. Each program concentrates on one specific area such as menus, edit fields, or buttons. Each chapter discusses significant points about the program it contains.

Section Three is a collection of short discussions of a wide variety of programming

topics. First there is a short introductory chapter. The next is a chapter of notes dealing with details of programming interactively. The third and last chapter of the section is a collection of bugs. Each section of the chapter discusses a specific bug. Most of these bugs infested the programs in the book during their development. By studying the bugs chapter, I hope you can avoid some grief. You may also discover how to debug some of your existing programs if you have already started writing programs with MS-BASIC 2.0.

Section Four presents four sample application programs partially developed. They are all usable, but none could be considered fully polished. They are complete enough to show you most of what you need to write your own applications. They are incomplete enough to allow you to change them to suit your own style of implementation.

Section Five wraps up the book with suggestions about how to continue your application development career using MS-BASIC 2.0. I have included summaries and cross references of the points illustrated by the programs. This includes a command by command chart. If you want to know which programs use the DIALOG (1) function, simply consult the chart.

PROGRAM LISTINGS

Each program is listed in full in the chapter that discusses it. I have tried to debug these programs as much as possible. In a few cases, bugs have been left in as challenges. In all such cases, I have indicated how to debug the code.

The program listings have many lines that contain a bold, outlined plus sign, ✚ . This is used whenever a long BASIC statement had to be placed on two printed lines. If you enter the programs by hand, you should make sure all such lines are put back together again. Otherwise, the lines will probably cause a syntax error. I will repeat this warning in several places throughout the book, so please bear with me. I would rather bore you with the explanation than have your versions of the programs fail to operate.

Macintosh Programming Using MS-BASIC 2.0

If you are intrigued with the possibilities of the programs included in *Macintosh Programming Using MS-BASIC 2.0* (TAB Book No. 2621), you should definitely consider having the ready-to-run disk containing the software applications. This software is guaranteed free of manufacturer's defects. (If you have any problems, return the disk within 30 days, and we'll send you a new one.) Not only will you save the time and effort of typing the programs, the disk eliminates the possibility of errors that can prevent the programs from functioning. Interested?

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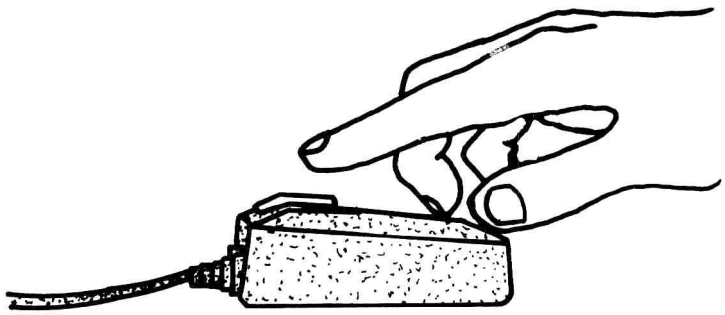
Chapter 1



A Tour of MS-BASIC on the Mac

Welcome to the world of Macintosh programming! This book introduces you to MS-BASIC 2.0 on the Macintosh computer. This is a much different language than the microcomputer BASICs of the past. But then the Macintosh is much different from the microcomputers of the past. The key to these differences lies in the user interface.

I originally entitled this book *Interactive Programming* because I emphasize Macintosh user interface features. MS-BASIC 2.0 has done an admirable job of making the Macintosh features available to the "rest of us" as the phrase goes. From MSB 2.0 you can access much of the built-in support for interactive programming: menus, windows, buttons, edit fields, dialog, the mouse, and Quickdraw graphics. And what is more, you don't have to be an "Inside Macintosh" guru to make it all work! You simply use the packaged commands that MSB 2.0 provides and the rest is automatic. Well, almost automatic.

In this chapter, I walk you through some of these capabilities. Along the way, you should get an idea of the kinds of topics that I emphasize in the remainder of the book. If the material here doesn't pique your curiosity, doesn't get your creative juices flowing, doesn't make you want to sit down and start work on your own MS-BASIC applications, then this book is probably not for you. On the other hand, if any of the things I just mentioned does happen to you, then read on! The fun is just beginning.

MENUS

In MS-BASIC 2.0 you get a MENU command with several different variations and a MENU function. You can create your own menus and display them on the menu bar. With the MENU ON and ON MENU statements, you can detect when the user has made

a selection from one of your menus. The MENU function enables you to detect which menu and which item from that menu was selected. From there, you can route your program to subroutines that respond to the various items you have incorporated.

Figure 1-1 illustrates the use of menus in MS-BASIC 2.0 programs. It is taken from one of the programs discussed in detail later in the book. Notice that you may have up to 20 items in your own menus, just as in the "real thing." Some features are not supported directly from MS-BASIC. You cannot change the type face or font in a menu. You can only place a check mark by an item—no other symbol. You cannot check a dimmed menu item. You cannot set up command key equivalents that are automatically detected by BASIC (although you can program this capability with extra BASIC statements—see Chapter 4). Finally, you cannot install items in the system menus. In particular you cannot install your own desk accessories from an MS-BASIC program.

WINDOWS

MS-BASIC 2.0 provides you with up to four different windows, which may be of four different types: document, shadowed, one-line border, or framed. Figure 1-2 illustrates these. The WINDOW command allows you to create and open windows on the screen. The WINDOW CLOSE command allows you to close an existing window. The WINDOW function provides your program with valuable information it may need while manipulating its windows.

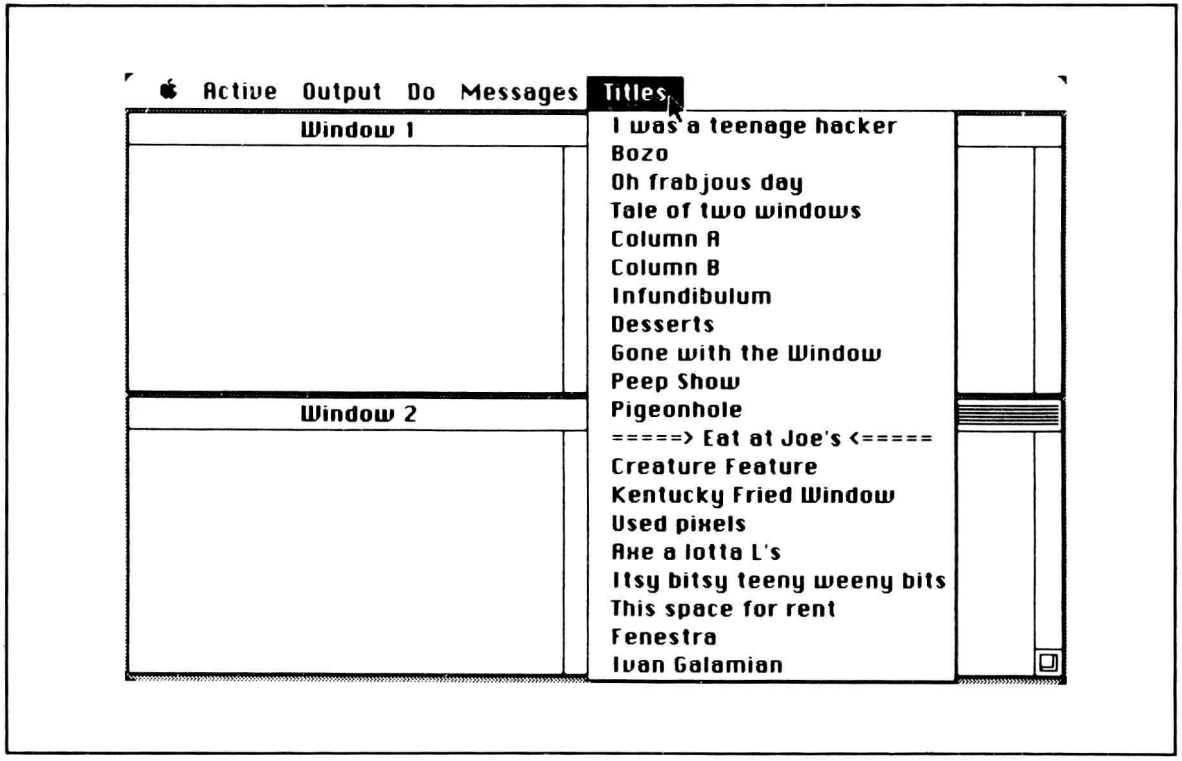


Fig. 1-1. An MS-BASIC menu with twenty items.

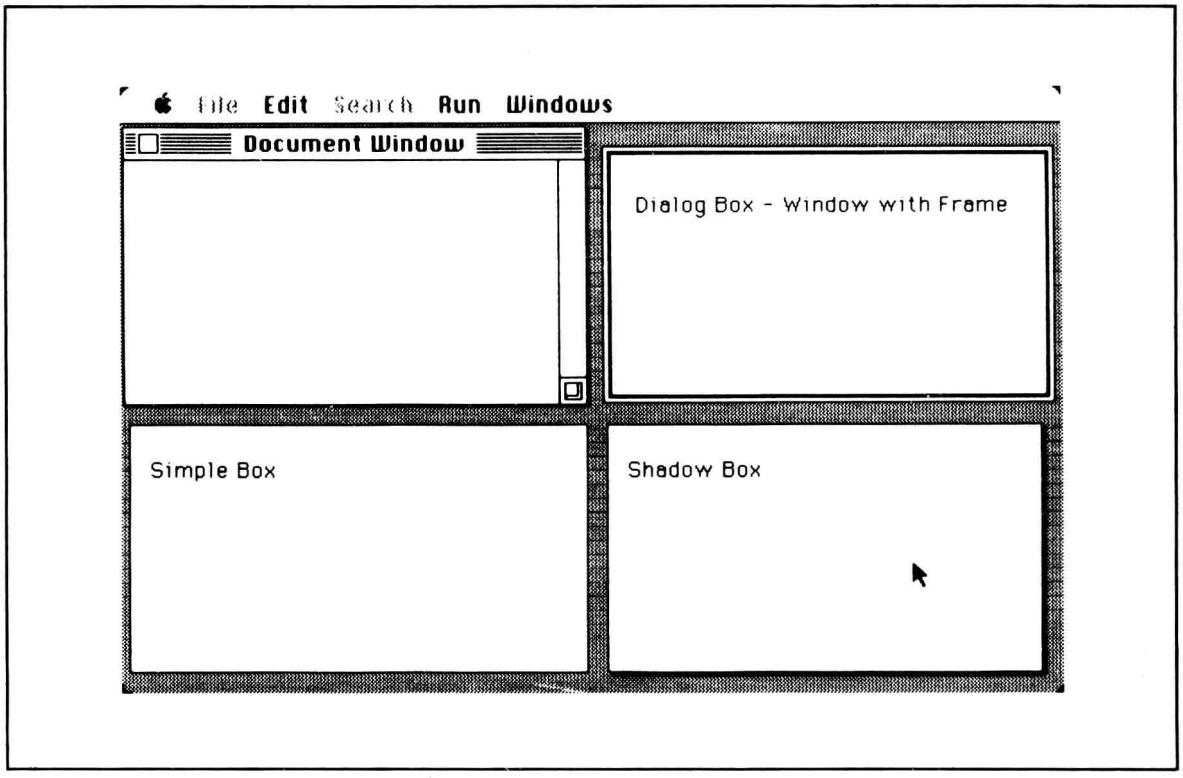


Fig. 1-2. The four types of MS-BASIC windows (clockwise from the upper left): document window, framed window or dialog box, shadowed window, window with a one-pixel border.

BUTTONS

Buttons are a most familiar part of the Macintosh landscape. With MSB 2.0, you can create push buttons, check boxes, and radio buttons. Then using the DIALOG function, you can detect when the user pushes one of them and make your program take the appropriate actions. You can design dialog boxes or use buttons in a number of creative ways in your programs. Figure 1-3 shows a window with lots of different buttons. It was created with the Dialog Design application discussed in Chapter Twenty-five.

EDIT FIELDS

Many of you may be interested in creating your own data processing type applications. The EDIT FIELD statement enables you to create fields on the screen into which a program user can enter data. The data can be freely edited using typical Macintosh editing capabilities. The EDIT$ function can be used to return the contents of an EDIT FIELD at any time. Your program can take any extra actions it needs to in order to reformat, validate, convert, or otherwise manipulate the data in the field. There are simple examples of the use of edit fields in several of the programs in the book.

Figure 1-4 shows an example of a simple form for entering names, addresses, and telephone numbers.

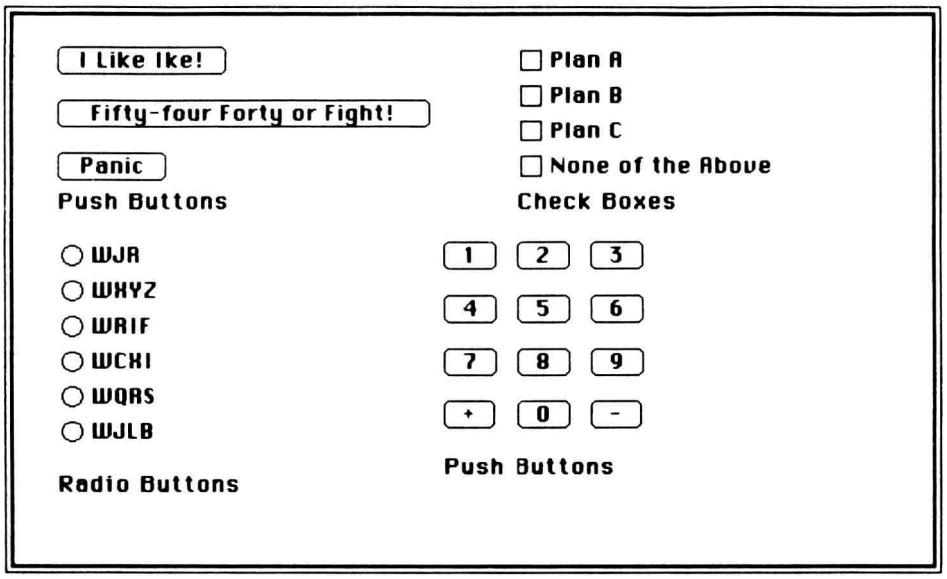


Fig. 1-3. Buttons galore.

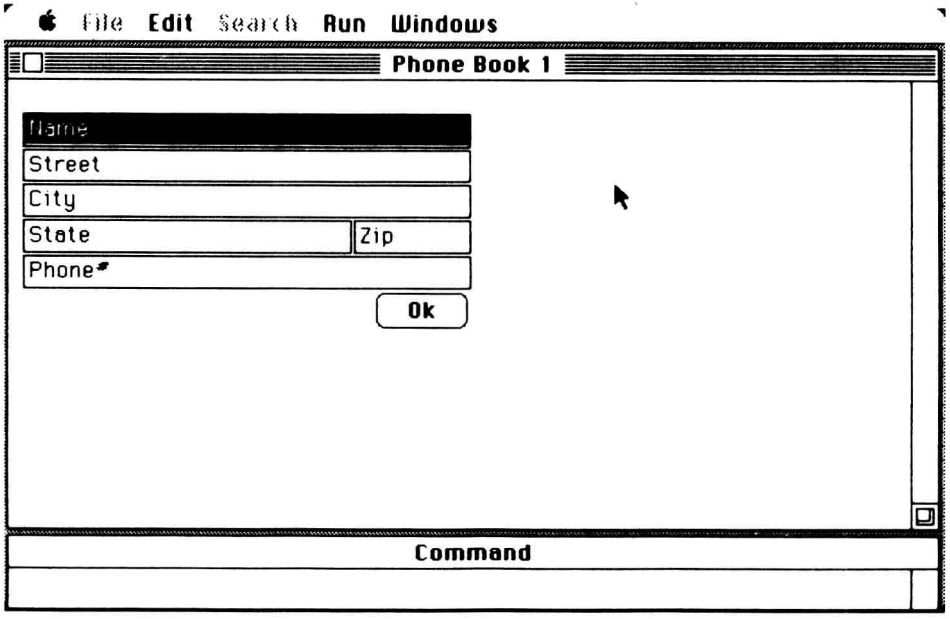


Fig. 1-4. A simple input form using edit fields.

DIALOG

The term *dialog* refers to most of the interaction between a user and a Macintosh program involving buttons, edit fields, and windows. MS-BASIC 2.0 provides a DIALOG function, which stores information about what *events* have occurred in your program. You can query this function at any time to find out the identity of the oldest event that your program has not yet responded to. You can also use the ON DIALOG statement. Its use will cause your program to be sent to a subroutine as soon as any event that the DIALOG function can recognize occurs. I discuss both ways of using the DIALOG function in the course of the sample programs and applications.

THE MOUSE

Ah, the mouse, that "wee, sleekit, cow'rin, tim'rous beastie." The mouse is indeed the most visible, most obvious, most publicized feature that sets the Macintosh apart from other microcomputers. You either love it or you hate it. There seems to be no indifference to the mouse.

What would programming the Macintosh be like if you couldn't access the mouse? One shudders to contemplate. Fortunately, MS-BASIC comes through when it comes to the mouse. It provides the MOUSE function with everything you ever wanted to know about the mouse. It will tell you where the mouse cursor is at all times and what the button has been doing since you last checked. The ON MOUSE, MOUSE ON, and MOUSE OFF statements enable you to GOSUB to a specific subroutine as soon as the mouse is clicked. These statements enable you to detect mouse clicking without having to check for it in every other line of your program.

Even with the MOUSE function and the ON MOUSE statement, there is a lot of trickery involved in programming with the mouse. Examples of mouse use pervade the programs I have included. If you study them all, you will have built a firm foundation in mouse techniques. You can then continue your career by inventing your own.

MS-BASIC GRAPHICS AND QUICKDRAW GRAPHICS

If the mouse is the heart and soul of the Macintosh, then graphics must be its beautiful face and body. MS-BASIC 2.0 provides both built-in BASIC commands and interfaces to the Macintosh Quickdraw ROM routines.

The graphic features in MS-BASIC 2.0 are almost too extensive to survey. BASIC commands are provided to draw lines and circles, scroll areas of the screen in various directions, and GET and PUT areas of the screen. The GET and PUT commands use BASIC arrays to store the screen information in a form known as a *bit-map*. With GET and PUT you can do amazing things. The Quickdraw interface is documented in the MS-BASIC Interpreter Manual. You should read that carefully as an introduction to those capabilities.

I have made extensive use of graphics in the programs included herein. Output from these programs is generously illustrated in the figures that accompany those programs.

IMPROVED STRUCTURE AND STYLE

MS-BASIC 2.0 has a totally different look to it than most microcomputer BASIC implementations. The most startling difference is the absence of line numbers. Not that they

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