

COMMODORE

64

**DATA
FILES**

— **David Miller** —

COMMODORE-64 DATA FILES

David Miller



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***COMMODORE-64
DATA FILES***

**Honor thy father and thy mother. . . .
Deuteronomy 5:16**

**To our parents: Harold and
Frances Miller and Emily Mark for
their continued encouragement
and support.**

acknowledgments

I would like to express my sincere appreciation to Dave Stewart, Mark Stewart, and Scott Bridston of Quality Computer Service for their patience and assistance. They are an excellent Commodore dealer. Rob Tyler and Forrest Kendall provided useful, timely suggestions and support. Ron and Elli Busch have courageously served as helpful testers on this and on previous books. Finally, Bill Sanders, author of *Elementary Commodore-64* et al. and a close friend from high-school days, gave needed encouragement to proceed with this book as my first priority.

***What exercise is to the body,
Programming is to the mind.
D. M.***

preface

The purpose of this book is to take some of the misery and mystery out of learning to use the Commodore-64's file structure. The book is aimed at people who would like to learn to use the computer to assist them at home or at work by using the file capabilities of the Commodore-64 personal computer. *Commodore-64 Data Files: A BASIC Tutorial* 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 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 creation programs for: the stock market, mailing lists, inventories, drill and practice, 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 commercial 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.

David Miller

***Books . . . (should) be read
as deliberately and reservedly
as they were written.***

H. D. Thoreau

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 meaningfully use the Commodore-64 personal computer.

No single book will suffice for everyone, and this book makes no claim to being the exception. But I have attempted to make it useful for the beginner as well as the more experienced Commodore-64 BASIC user. 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 BASIC user includes a thorough discussion of DIF files with application programs. Other items are: random (relative) access files, automatic, initial use, file-creation techniques, and tape files.

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 Commodore-64. Experienced BASIC 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 two-diskette set containing all the programs presented in the book is available. You can make the diskettes 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 two diskettes. I sincerely hope you enjoy the book and find it instructive.

Commodore-64 keyboard

Everyone seems to have difficulty with at least some aspect of using a keyboard to communicate with a computer. It does not seem to matter which computer it is or even how much typing experience a person has. And until better methods of human to machine communications are developed, we are stuck with learning to effectively use the keyboard. This initial learning process is often very important. Some people have become convinced that they cannot work with computers when, in fact, they are simply having difficulty with the keyboard. Therefore, it is imperative for new computer users to become as familiar with the keyboard as possible.

The Commodore keyboard is laid out in a manner very similar to a standard typewriter keyboard. The Commodore keyboard contains all the standard keys plus some keys designed specifically for the computer. When the computer is first turned on, the screen will display all typed keys in upper case mode. This means that all letters typed will appear as capital letters. All keys that have two characters on the key tops will display the lower character when the key is pressed by itself. The upper character will be displayed when the SHIFT key is pressed and held and the key containing the desired upper-portion character is also pressed. In other words, to display the \$ symbol on the screen, the SHIFT key must be pressed and held while the key containing the characters \$ and 4 is also pressed. Keys that do not contain two characters on the key top but do contain graphic characters on the front

of the key will display the graphic character that appears on the right side of the key whenever the SHIFT key and that key are pressed.

The blinking box (called the cursor) can be moved around the screen with the use of the CRSR keys and the SHIFT keys. Pressing the left/right arrow CRSR key by itself will move the cursor to the right. Pressing the SHIFT key and the left/right arrow CRSR key will move the cursor back to the left side of the screen. In either direction, when the cursor comes to the end of the line, the cursor will move to the opposite side of the screen and either up or down a line. Pressing the up/down arrow CRSR key by itself will move the cursor down the screen. With the SHIFT key, the up/down arrow CRSR key moves the cursor up the screen but this time it will not go beyond the top of the screen. Pressed by itself, the CLR/HOME key immediately “homes” the cursor to the top left hand corner of the screen. Used with the SHIFT key, this key clears the screen and then homes the cursor. The INST/DEL key by itself will delete characters to the left of the cursor. Used with the SHIFT key, the INST/DEL key will insert spaces to the right of the cursor.

To place the computer into the lower case mode, the Commodore key, in the extreme lower left hand corner of the keyboard, and SHIFT key must be pressed. While in lower case mode, the keyboard functions very much like a typewriter keyboard. The SHIFT key and a letter key will produce a capital letter. Without the SHIFT key, letters are displayed in lower case. Keys with two characters on the key tops work in the same way they did in upper case mode. The CRSR, CLR/HOME, and INST/DEL keys also function in the same way they did in upper case mode. The left side graphic character is displayed by pressing the Commodore key and the key containing the graphic symbol.

Of particular importance is the SHIFT/LOCK key. This key can be used to display a number of characters that require the SHIFT key, but should NOT be depressed when the RETURN key is used. The RETURN key is used to inform the computer that the user has finished entering a line of instructions/information. This key is the single most used key on the keyboard and the key that frequently causes beginning computer users to wonder why the computer is not doing what the user wants the computer to do. Most of the time, the RETURN key will need to be pressed after you have finished typing a line even if the line only has a few characters on it. The RETURN key informs the computer that the user is finished and wants the computer to do something. But if the SHIFT/LOCK key is depressed, the RETURN key does not function as a RETURN key. It does not inform the computer that the user is finished. This quirk of the Commodore keyboard has caused many people to wonder if their computer was not broken. The “quick fix” has been to unlock the SHIFT/LOCK key and then press the RETURN key. The RUN/STOP key and the RESTORE key sequence can be used to stop certain programs or certain operations.

Finally, new users may experience problems with the auto repeat feature of some keys. Depressing those keys (the SPACE BAR for one) for more than a fraction of a second causes the key to automatically repeat itself. For certain keys,

this feature can be very useful. But until you get used to it, the auto repeat feature may cause a few problems.

Although the standard Commodore BASIC interpreter allows 80 characters on a line, it was necessary in the printing of this book to limit the number of characters to approximately 57 per line. That is the reason you will see words split in two. When you are typing in a line from a listing given in the book, it is preferable to continue typing the line for as many characters as the BASIC interpreter will allow, regardless of where the break occurs in the listing given in the text. And since the Commodore screen display is normally only 40 characters per line, the break in the text listing will not match the point at which you will actually be typing on the next line. The point is that you do not need to break the line according to the text listing if the line is longer than 57 characters. Therefore, do not expect the screen listing to look exactly like the listing given in the book.

■ ***An Important Note About the Program Listings***

There are two types of Program Listings: (1) Listings that appear within chapters, and (2) Listings that appear at the end of the chapters. The first type of listings, *i. e.*, those that appear within the text of a chapter, have been typeset and are NOT taken directly from a computer printout. Since these listings have been typeset, the position of characters and spaces relative to other characters and spaces may not match the actual position of characters and spaces when entered into the computer. However, the second type of listing, *i. e.*, listings that appear at the end of chapters, do come directly from a computer printout. These listings have been photocopied directly from my program listings. Therefore, in all matters, the listings at the end of the chapter should be regarded as authoritative since they come directly from working programs.

I printed these listings using a very good letter quality printer but, unfortunately, one that did not have a printwheel with a slash through the zero, two distinct characters for the lower case L and the number one (1), or a true up-arrow. Therefore, it is imperative that you read the text and look closely at the printouts and determine which character to type when entering these programs. The up-arrow appears in the printouts as the ^ (raise to the power of) character. The inadequacy of the printwheel was one of the reasons the listings within the chapters were typeset.

bookware

The programs in this book are available on two diskettes. Additional file programs and documentation are also included. To order your two-diskette set, please send \$25 (\$27.50 outside North America) to: C-64 FILES, AEN, 9525 Lucerne St., Ventura, CA 93004. California residents, please add 6% sales tax. Please be certain to specify C-64 FILES!

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1 --- *introduction to the Commodore-64® 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 Commodore-64 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 a file cabinet containing different types of information. *The Commodore-64's file cabinet is the disk drive and diskette* (or for those without a disk drive, the *datassette recorder and cassette tape*). The majority of this book will be directed toward the reader with one or more disk drives, but the first part of the book will include information

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