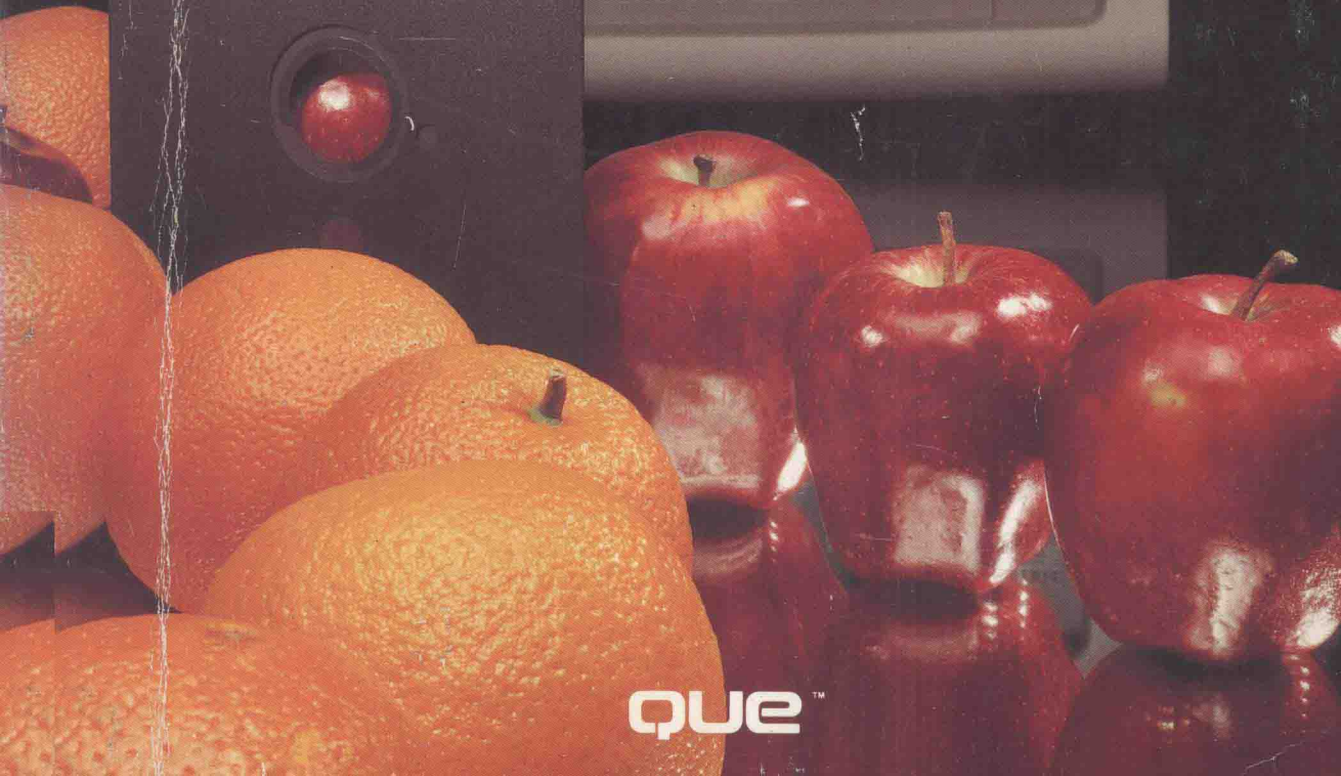


2nd Edition

# dBASE III<sup>®</sup> PLUS HANDBOOK

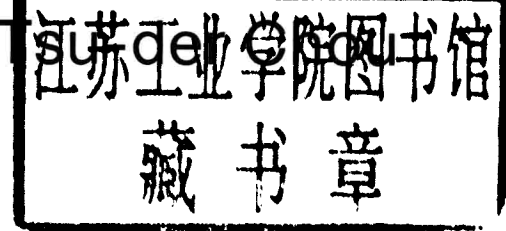


que<sup>™</sup>

# Handbook

2nd Edition

George Tsou



**que™**

Que™ Corporation  
Indianapolis, Indiana

dBASE III® Plus Handbook, 2nd Edition

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Dedicated to  
my wife, Jane-Wen  
and our children  
Doris, Tina, and Tom

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Dr. Chou wrote the popular *dBASE III Handbook* and *Using Paradox*, both published by Que Corporation. He is also the author of *Microcomputer Programming in BASIC* and *Computer Programming in BASIC*, both published by Harper & Row. The former has been translated into Spanish and published in Mexico; reprints of that book have also been distributed in the Philippines.

Dr. Chou has also written a financial analytical modeling program, COMPASS (Computer Assisted Portfolio Planning Management System). Combining database and analytical tools, this software represents the first major effort in the computerization of portfolio management. COMPASS, marketed by Morley & Associates, has now been adopted by many major banks and financial institutions in the United States and Canada.

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# Introduction

Welcome to the wonderful world of dBASE III® Plus. Just a few years ago, the power of database management could be enjoyed only by users of large, expensive computer systems. However, the introduction of dBASE II® changed the way data was organized and manipulated on small and cost-effective but powerful microcomputers. As a result, individuals and small businesses could benefit from these types of database management programs.

Although many different database management programs are now available and new products are being added to the market almost weekly, dBASE II has maintained its leading share of the market. But because dBASE II was designed for the early generations of microcomputers and has limited memory capacity and computational power, the size of the database and the processing speed of the program were compromised. In addition, dBASE II was not considered user-friendly because its effective use required programming. However, the introduction of dBASE III® has effectively solved these problems.

Even though dBASE III evolved from dBASE II, dBASE III is a drastically different computer program designed to take advantage of the greater power of present-day microcomputers. The program's data-storage capacity and computational speed have been greatly increased; and dBASE III is easy to use, without sacrificing dBASE II's programming capability. Certain other database management

programs that may be more user-friendly than dBASE III are adequate for many simple, small-scale database applications. But larger and more complex database applications need the strong, flexible programming features offered by dBASE III—features that have been matched by no other program.

Ashton-Tate, Inc., the developer of dBASE III, responded to the demand for a friendlier, more powerful program by introducing dBASE III Plus in late 1985. This new version of the program provides not only additional data-processing commands but also a pull-down menu interface; to perform many dBASE III commands, the user simply selects dBASE III Plus menu items.

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## How Do You Use dBASE III Plus?

As a database management tool, dBASE III Plus has two processing modes: *interactive mode* and *batch-processing mode*. In interactive mode, you can create and manipulate data files by typing easy-to-use, English-like commands directly from the keyboard or by selecting the appropriate menu options. Because the computer responds instantly, you can monitor the input and output processes.

The other mode, batch-processing mode, is one of the most important capabilities provided by dBASE III Plus. Batch processing offers all the power and flexibility necessary for designing an integrated menu-driven database management system.

A primary objective of the *dBASE III Plus Handbook*, Second Edition, is to demonstrate how dBASE III Plus commands can be used for effective database management. For purposes of clarity, the examples in this book have been kept simple and concise. To maintain continuity among the examples, the same database is used to illustrate as many different commands as possible. Because of all the features incorporated, simple examples give you a better understanding of the underlying principles. Once you fully understand the principles of database management and the correct uses of the dBASE III Plus commands, you can easily design a more sophisticated database system of your own.

The *dBASE III Plus Handbook* is intended not as a substitute for the dBASE III Plus manual but rather as a user's guide that goes beyond the basics presented in the manual. The book shows you how the commands can be integrated to perform useful tasks. Furthermore,

because the dBASE III Plus commands are grouped by functions, the *dBASE III Plus Handbook* may be used as a comprehensive reference manual.

## Who Should Use This Book?

If you own dBASE III Plus, you should use this book. If you compare database management with writing, you can think of the dBASE III Plus manual as a dictionary that lists and describes the commands and vocabulary, whereas the *dBASE III Plus Handbook* shows you how to compose with these commands and vocabulary items. From the easy-to-follow examples, you can learn how to design and create a database for your own data management needs. By duplicating the examples, you can learn firsthand how those commands are used for various functions. When it comes to mastering the dBASE III Plus commands, no approach is better than doing it yourself.

This book is also for you if you do not own dBASE III Plus but are considering purchasing the program. Chapter 1 introduces the concept of a database and gives you a general understanding of how a database can answer your data management needs. Chapter 2, “Introduction to dBASE III Plus,” provides an overview of dBASE III Plus and of ways you can use the program to perform database management functions. Examples in subsequent chapters demonstrate the powerful utilities offered by dBASE III Plus.

If you own dBASE III, this book will be useful: You can learn about the new features of dBASE III Plus before you decide whether to switch from dBASE III to dBASE III Plus. All dBASE III commands are valid and acceptable in dBASE III Plus; those commands can be used for the examples in this book. Using dBASE III’s interactive mode, you enter the commands at the “dot prompt.” You can use the same method with dBASE III Plus; furthermore, you can also select appropriate Assistant menu options for many of the commands. The menu interface may seem more “friendly” to first-time users of the program; but after you have learned how to type in a command at the dot prompt, you may find this method more efficient than using the menu interface.

If you are a dBASE II user, the *dBASE III Plus Handbook* is for you. In addition to the comparison of dBASE II, dBASE III, and dBASE III Plus that appears in Appendix B of this book, the *dBASE III Plus*

*Handbook* provides in-depth discussions of new commands and programming features offered by dBASE III and dBASE III Plus. From this information you may see that you can significantly increase your programming productivity by switching from dBASE II to dBASE III Plus.

One of the significant new features offered by dBASE III Plus is its networking capability. Because of the complexity of setting up dBASE III Plus in a network environment, a complete discussion of that topic is beyond the scope of this book.

## What Is in This Book?

Chapter 1, "An Introduction to the Database Concept," discusses the basic concept of database management. The chapter introduces some commonly used models for data organization and explains the differences between hierarchical databases and relational databases. In this chapter, you will see the simplicity of the relational database model, which is the model chosen by Ashton-Tate for dBASE III Plus.

Chapter 2, "Introduction to dBASE III Plus," covers the specific features of dBASE III Plus and the development of the program from dBASE II and dBASE III. In addition, this chapter explains the design philosophy that makes dBASE III Plus a more powerful computer program than many programs currently on the market.

Chapter 3, "Getting Started," introduces the basic steps involved in configuring your system for using the dBASE III Plus program. The chapter begins with a brief discussion of the basic components of an IBM® Personal Computer and then explains how to initialize a disk with the disk operating system (DOS). In addition to describing how to install dBASE III Plus on your computer system, this chapter explains how to prepare the system disk and specify the necessary number of files and data buffers.

Chapter 4, "Creating and Displaying Data," begins a discussion of the dBASE III Plus commands and Assistant menu options that can be used in interactive mode to perform basic database management functions. This chapter explains the initial steps for defining a data structure and creating a database file. The chapter also discusses the menu options and dot-prompt commands used for displaying the information stored in a database file. Menu options and dBASE III Plus commands for managing disk files also are discussed in this chapter.

Chapter 5, “Querying the Database and Editing Data,” discusses the steps for modifying the structure and contents of an existing database file. This chapter shows you how to use dBASE III Plus query operations to filter the records in an existing database file. Furthermore, this chapter illustrates the procedures involved in adding new records to, removing records from, and changing the existing contents of a database file.

Chapter 6, “Sorting, Indexing, and Summarizing Data,” explains the procedure for rearranging the data records of a database file. The text describes the methods for sorting data records and indexing files and explains why one method is better than the other. Examples illustrate these operations in detail. In addition, this chapter introduces the dBASE III Plus menu options and commands you can use to generate such summary statistics as sums, totals, and averages.

Chapter 7, “Memory Variables, Expressions, and Functions,” discusses storing data in temporary memory locations called *variables*. The chapter demonstrates the usefulness of expressions in data manipulation and shows how you can perform sophisticated mathematical operations and convert data from one type to another by taking advantage of dBASE III’s built-in functions.

Chapter 8, “Generating Reports,” introduces the methods for generating custom reports. In addition to explaining the dBASE III Plus menu option for designing and producing reports, this chapter discusses the program’s powerful built-in label and report generators. You can avoid tedious, laborious steps by using these label and report generators to design custom labels and reports.

Chapter 9, “Fundamentals of Command-File Programming,” introduces the use of batch-processing mode. The text explains how a set of dBASE III Plus commands can be assembled as a program file, which is then processed as a batch of instructions to be carried out by the computer. Through the use of numerous examples, this chapter shows the power and flexibility of batch mode. Most important, this chapter shows how easily you can use batch mode in complicated data management applications.

Chapter 10, “Input and Output Commands,” discusses the ways in which input and output operations can be performed by commands in a program file. The chapter introduces program segments you can use to edit or append the data records in a database file and shows how you can use command-file programming to produce custom reports on a monitor or a printer.

Chapter 11, “Conditional Branching and Program Loops,” covers the use of the DO WHILE command to perform database management functions that require repetitive operations. This command is one of the vital links between interactive command processing and command-file programming. The power of command-file programming lies in the DO WHILE command.

Chapter 12, “Modular Programming,” discusses the concept of structured programming. In this chapter, you learn how to divide a database management system into several smaller easy-to-manage subsystems that you then link through a multilevel menu. You also learn how to design a database management program that uses several different database files.

Chapter 13, “An Integrated Database System,” presents a model illustrating a complete database management system for a small business. In this chapter, you see how to design and integrate various data management functions such as billing, inventory, and account maintenance in a menu-driven dBASE® program.

## The Appendixes

The *dBASE III Plus Handbook* contains six useful appendixes. Appendix A presents the standard ASCII character codes. The differences between dBASE II, dBASE III, and dBASE III Plus are summarized in Appendix B. Appendix C is a summary of the function and control keys used in dBASE III Plus, and Appendix D is a summary of dBASE III Plus commands with many examples. The program’s built-in functions are listed in Appendix E. Appendix F presents a summary structure of the Assistant menu options. These handy reference sections should prove valuable to both beginning and experienced dBASE users.

PLUS

## Conventions Used in This Book

For purposes of clarity, different typefaces are used in this book to distinguish entries made from the keyboard, messages displayed by dBASE III Plus, and dBASE III Plus menu options from the surrounding text. Keyboard entries, when they appear in running text, are in *italic type*. Messages appearing on-screen appear as follows: **End of file encountered**. Menu options, such as **Setup** and **Create**, are also in a contrasting typeface.

Series of menu options and keyboard entries appear as follows:

Create/Database File/B:/*EXAMPLE.DBF*

The slash (/) serves only to delimit menu selections and keyboard entries; it is not entered from the keyboard.

In explanations of the “dot-prompt” commands, the dBASE III Plus dot prompt (.) is shown for illustrative purposes. The dot prompt is displayed by the dBASE III Plus program and should not be entered from the keyboard.

In illustrations of the dot-prompt commands and dBASE III Plus functions, angle brackets (< >) are used to indicate variable command elements, as in

. SORT TO <sorted file> ON <key field> FOR <a qualifier>

The angle brackets should not be entered; a file name, without angle brackets, should be entered in place of <sorted file>.

Because of space limitations, many of the command lines are shown on two lines in this book, even though the commands are actually entered on a single line at the dot prompt or in a program file. For example,

. SORT TO ROSTER ON ANNUAL\_PAY/D, LAST\_NAME  
FOR MALE

should be entered on a single line at the dBASE III Plus dot prompt or in a program file.

The PLUS symbol in the margin indicates that a paragraph or section discusses commands, operations, or program features that have changed or are new with dBASE III Plus.



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