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dBASE II®

A Comprehensive User's Manual

KERMAN D. BHARUCHA

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FIELD 01   :EMP:NUM     C  006  000 :
FIELD 02   :EMP:NAME    C  015  000 :
FIELD 03   :TOWN        C  012  000 :
FIELD 04   :ORG         C  003  000 :
FIELD 05   :YR:OF:HIRE  N  004  000 :
FIELD 06   :SALARY      N  008  002 :
FIELD 07   :DUMMY       C  001  000 :
FIELD 08   :                        :
FIELD 09   :                        :
FIELD 10   :                        :
OK
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dBASE II®

A Comprehensive User's Manual

Introduction

dBASE-II is the name of a software package marketed by Ashton Tate, Inc., and is a powerful development tool for microcomputer business applications. If you utilize a microcomputer for personal or business needs but have never had the pleasure of working with dBASE-II, or if attempts at working with dBASE-II through the technical manual have proven frustrating, then the solution to both situations is contained in this book.

"dBASE-II—A Comprehensive User's Manual" discusses version 2.41, dated February 1, 1984, and has been written for the person who wants to get started *overnight* on serious development of business applications without going through the hassle and frustration of reading the technical manual on dBASE-II. You begin with the study of some fundamental computer concepts, including a general discussion on data-bases, before beginning your study of dBASE-II. Within the dBASE environment, you will learn how to create a data-base, edit/modify the data-base so as to guarantee the integrity of both data and structure, sort/index the data to rearrange it for reporting, pull off reports from the data, and write your own computer programs in dBASE to increase your power and flexibility with dBASE-II.

Obviously, no attempt has been made at any time to replace the manual. The full use of this book will take you a very long way towards effectively utilizing this powerful software, but the most complete repertory of commands is still the dBASE-II technical manual. The study of this book will guarantee your ability to understand, without further external assistance, any specific commands from the manual not explicitly covered here.

As each command is discussed, several "What-If" types of possibilities are explored for that command, so that you are not left in any doubt about multiple choices of action available, or their outcomes. Specific instructions are covered in one area of the book so you will not have to search through the whole book for answers. The index will direct you to the explanation for the various commands.

Literally zero data processing knowledge is presumed, and the approach taken has been that of guiding a novice through the paces of running and effectively utilizing dBASE-II. To that extent, the book has been formatted in three sections. Section 1 discusses some fundamental computer concepts and data-base concepts. Section 2 starts off with the study of dBASE-II Basic Features, and you will learn how to create, edit, modify, sort, index and report from any data-base. Section 3 is the Advanced Features section. In this section, you learn to write your own programs in dBASE-II, starting with the simplest of programs and working your way up to a high degree of programming sophistication.

The appendices contain the report generation program and all of the menu programs. They have been provided for your use without all the comments and explanations that were supplied in the text.

If you feel that you already know some dBASE-II, then follow through the table of contents down to the logical point you wish to pick up from. However, reading all the preliminary material will virtually guarantee even the experienced dBASE-II user of absorbing additional, useful information on this subject.

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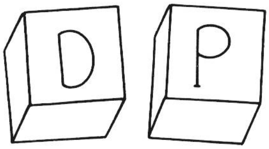
Part 1
Fundamentals



1. Data Processing Fundamentals

In this chapter, I will introduce some definitions, explain some procedures, and answer some questions. If you are generally familiar with microcomputers and if you already use dBASE-II, you may prefer to skip all preliminary information and scan the table of contents for specific topics of interest.

Data Processing. *Data processing* is the systematic *collecting, analyzing, summarizing* and *reporting* of data. The function of data collection is, by far, the costliest of these four functions, and the most time-consuming, since it requires substantial human input into the process. Subsequent functions, of course, are purely mechanized by way of the computer.

Computer Program. A *computer program* is nothing more than a series of instructions to a computer. These instructions are, for the most part, *sequential* in nature. If you can manage to write a few instructions, in any computer language, and if you can manage to store these instructions in a module on an external device (say, a floppy diskette), then you have created a computer program. Computer programs can range from simple, to supersophisticated, depending on the output requirements of the program.

Hardware. The term *hardware* refers to the physical computer itself. Anything you can see and touch, the electronics of the machine, the various peripheral devices such as CRT (screen), keyboard, disk-drives, printer, and modem are all encompassed in the term hardware.

Software. *Software* refers to the computer program or programs that control a computer system at any point in time. The microcomputer usually runs only one program at a time, but in the case of main-frame computers, several hundred program modules could be executing simultaneously.

CPU. The basis of any computer system is the piece of hardware known as the *central processing unit* (CPU). This piece of hardware contains all the electronic circuitry required to perform the functions of *arithmetic, logic,* and *control.* It is the brains of the microcomputer system.

At any point in time, the CPU performs one of the following three functions:

1. It *obtains* the *next sequential instruction.*
2. It *interprets* that instruction.
3. It *executes* that instruction.

The cycle repeats, beginning again at step 1, for each instruction.

Memory. Another piece of hardware in a computer system is that known as the *main memory structure* of the system. For now, it is useful to visualize memory as being comprised of individual cells, like post office boxes, with each box being capable of containing one character.

The term *character* refers to a digit (0 through 9), a letter (a through z, or A through Z) or a special character (such as the @ # $ % & *, etc). The CPU has direct access to any memory-cell at random, and hence the main-memory structure is known as *Random(ly) Access(ible) Memory* or *RAM.* Since the CPU goes through life obtaining, interpreting and executing instructions, it stands to reason that the computer system must have a way of providing these instructions to the CPU. This is the function of main memory. In the case of a microcomputer system, the entire program that is currently executing needs to be in main memory, so that the program instructions can be accessed by the CPU. Also, main memory contains that portion of the data that the program is currently working on.

Peripherals. Surrounding the CPU and RAM are the external devices for permitting information to flow into and out of the computer system. The *keyboard* is the basic input device for placing information directly into a reserved area of memory. The *screen* is the basic output device for visual display of a reserved area of memory. The *disk drives* are used for permitting access to floppy diskettes on which information can be magnetically stored, or from which information can be retrieved. The *printer,* of course, is the basic output device for hard-copy displays.

Characters. If you want to store your name in a computer system, you will have to provide the system with the letters comprising your name. These are the individual *characters* of your name.

Suppose you also want to store your address in the computer system. You will have to supply to the system all the individual characters (letters and numbers) comprising your full address. So also, for your employee number, or organization, or salary, or any other *piece of information* you want to maintain for yourself.

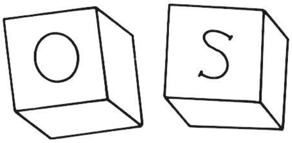
Field. Each piece of information so created through the use of characters is called a *field* of information. Thus, you may have created your name-field, your organization-field, and your salary-field with the use of the appropriate characters.

Record. Now, if you have stored all the information you may want about yourself, in the form of fields of information, you have managed to create one *record* of information, about yourself.

File. As you may have guessed, if you can do the same for some of your colleagues working in the same department, you will have managed to create a *file* of information comprising several records of information.

These last four definitions can be summarized as follows:

A *file* is made up of individual records of information.
A *record* is made up of individual fields of information.
A *field* is made up of individual characters of information.
A *character* is any number, letter, or special character.



2. Operating System Fundamentals

An operating system is a collection of program modules that provide, among other things, an interface between an executing program's logical requests for input/output operations, and the physical aspects of carrying out the input or output request.

For example, your program has started execution, and at some point in time, it issues a logical read type of request. The operating system's module takes over, since it has to figure out where on the face of the disk the next block of data is located. Having obtained that information, it has to complete the task of loading that block into computer memory and then hand control back to your program.

Your program continues churning away, until it provides a request to write out to disk. Once again, the operating system takes over. It has to figure out where on the face of the disk there is space for the next block of information to be stored, and having figured that out, it has to complete the output operation and write the block out from memory to disk, and hand control back to your program.

Each time your program requests any kind of input or output operation to be performed, the modules of the operating system take over, and perform that task. This is how the operating system *interfaces* between your program's logical input/output requests and the physical aspects of carrying out the input or output request. Apart from providing this area of commonality for input/output for all programs, the operating system also handles disk-file maintenance and access procedures, and the physical loading and execution of programs. This, of course, is a very simplified explanation of some of the workings of an operating system, and depending on the computer system you are using, the operating system for that computer could be anything from basic to super complex.