

LBASE IVTM

A READY REFERENCE MANUAL

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Introduction to Databases and dBASE IV

RELATIONAL DATABASES

A **database** is a collection of related information that is organized and stored in files in a manner that permits easy access to individual units of data. For example, all of the information, or *data*, necessary to produce paychecks might be in a payroll database. Information necessary to keep track of a store inventory would be contained in an inventory database.

A **relational database** organizes information in such a way that data stored in one file can be easily accessed from other files. It is called a relational database because data can be accessed based on its relation to other data. This permits the information stored in one database to be used in many different ways and in many different relationships with other databases.

In **dBASE IV**, relational database information, the data, is organized in one or more two-dimensional tables. Each table consists of columns and rows of data. Each column contains one kind of data item and each row represents the different facts about that item that make up one database entry.

The column data types are called **fields**. A field always contains the same kind of data. For example, in an inventory database used by a bookstore, the first column or field might contain the ISBN-number of a book and the second column the book's title.

Each row in the database contains all of the different kinds of fields concerning one item. This group of related fields is called a **record**. To continue the bookstore inventory example, the first record for one item in the bookstore's database might

consist of

FIELD NAME	RECORD #1
ISBN_Number:	0-201-9978-2X
Description:	LISP
Author:	Winston
Publisher:	Addison-Wesley
Price:	\$34.00
Q_On_Hand:	20
Q_On_Order:	30
Date_order:	89/10/05

Each collection of records (tables of rows and columns) is called a **database file**. The database can consist of one or several database files. Files are linked by **relationships** on unique identifying fields of different database files.

dBASE IV is a computerized file system manager that is designed to let you enter new data, change, rearrange, delete, view, and query existing data, and generate reports using data stored and organized in relational database files. When working with a database, you are concerned with three main aspects:

File structure	A list of fields that indicates the kind of information stored in the file. Since the file structure describes the characteristics of the database, it must be defined before data can be entered.
Records	The data or information stored in the database.
Sequence	The order of records, which is controlled by either sorting or indexing a file. An index is a field that is used to control the sequence of data when generating queries or reports. Indexes may be defined when the file structure is created or by editing the file.

DATABASE FILE STRUCTURE

Think of a tabular chart of rows and columns. The database file structure defines the number of columns of different data items stored in the file. The file structure specifies the kind of data stored in each column, the width of the column, and the number of decimal places used in the columns designated to hold numeric information.

The database file structure consists of the following:

File name	A file name consists of no more than eight characters. No spaces are permitted in a file name, but a combination of letters, numbers, and the underscore (<code>_</code>) is allowed. The file name may be followed by a period and a three-letter file extension such as <code>.dbf</code> , <code>.mdx</code> , or <code>.frm</code> .
Field name	A field name contains up to 10 characters. The first character must be a letter. The remaining characters may be any combination of letters, numbers, or underscores (<code>_</code>). No spaces are permitted.
Field type	The field type identifies the kind of data stored in the column (field). dBASE IV defines six types of data field: character, numeric, floating value, date, logical, and memo fields. Character and numeric data are stored differently.
Field width	The maximum number of characters allowed in a field.
Decimal	The number of decimal places in each numeric field must be indicated.

For more information on file structure and field types, see the chapter Creating a dBASE IV file.

dBASE FILES

Creating and Working with a Database File

Before you can query the database for information or create reports, you must first create database files. The process of creating a file will be explained in the next several chapters of this book. The basic steps of the process are as follows:

1. Create the file structure by defining the field names, types, and widths, and defining the number of decimal places for numeric and/or floating value fields.
2. Select the file, if records are not entered immediately after the file structure is created.
3. Enter data, record by record.
4. Save the entered data.
5. Once a database file is created, you can add, edit, rearrange, mark records for deletion, remove records from the file, query the database file for specific information, or generate reports and labels using the data contained in the file. Any changes or additions to the file must be saved in order to have the changes written to disk.
6. Close the database file when finished working with it.

KINDS OF dBASE IV FILES

Some of the kinds of files in dBASE IV are listed below along with the file extension assigned by dBASE IV.

FILE	FILE DESCRIPTION
data (.dbf)	Contains the fields and records defined in your file structure.
query (.qbe, .upd)	Contains instructions for manipulating data in the database files.
form (.scr)	Is a custom screen display used for entering, editing, and viewing records.
report (.frm)	Is used to print records in a defined format.
label (.lbl)	Displays the layout of labels in defined formats with data from database files and specifies how to print them.
program (.prg)	Contains dBASE IV programming code for specific applications that use the database files, views, forms, reports, and labels.

The various files are created and accessed from dBASE IV's **Control Center** screen. Each kind of file is displayed in its own panel on the screen. In addition, you may access DOS and other application files from the **Applications** panel.

Other files are created by dBASE IV for its own use to describe the different structures that you create by means of the menu screens. As a result, each query, form, report, label, and program file can be defined by as many as three files:

FILE	ORIGIN
design files (.sctr, .frm, .lbl)	Created on design screens.
generated code files (.fmt, .frg, .lbg)	Created automatically by dBASE IV when design files are saved.
Compiled files (.fmo, .fro, .lbo, .dbo)	Created when you use a query, form, report, label, or program to make the files run faster.

If you copy dBASE IV information onto a disk for use on another system, be sure to copy all of the relevant files. You need not worry about these files otherwise.

SYSTEM REQUIREMENTS

dBASE IV requires version 2.0 or greater of MS-DOS or PC-DOS version 2.0 and runs under IBM OS/2 version 1.00 in DOS compatibility mode. The minimum amount of computer memory (RAM) required is 640K, and a hard disk is necessary for storing the program files.

SYSTEM LIMITATIONS

The maximum number of characters and the restrictions on character use are as follows:

Characters/record	4,000
Characters/record-memo file	512,000
Characters/character field	254
Characters/numeric field	19
Characters/memo field	4,096
Number of active files (all types)	99
<i>Note:</i> A database file that contains a memo field counts as two files.	
Number of active database files (.dbf)	10
Number of active index files (.ndx)	47
Number of format files/database file	1
Number of records/database file	1 billion

Starting dBase IV

THE RELATIONSHIP BETWEEN THE CATALOG AND THE CONTROL CENTER

Perhaps the biggest difference between dBASE IV and its predecessors is the **Control Center**. This screen is used to direct data base activities. In previous versions of dBASE, dot commands were used to direct data base activities. Now, the control center screen is used to activate and access files, change from one activity to the next, or select a menu. This screen is displayed each time you enter dBASE and you are returned to it after completing an activity.


The names of the files created using the Control Center are stored in a **catalog**. Selecting one of the control panels directs you to that database activity. dBASE IV uses the catalog as a means of relating all of the files that concern a single database. The names of all of the data, query, form, reports, and label files associated with a given database are all stored in the same catalog.


The name of the current catalog appears in the Control Center heading. When dBASE IV displays the contents of the current catalog, it arranges the file names in groups by file type. Each type of data occupies its own column or **panel**. For example, all data files are listed in the Data panel. If the catalog does not contain the names of the files you wish to work with, you must change catalogs before you begin any other activities.




INSTALLING dBASE IV

If dBASE IV has not already been installed on your computer, use the directions on page 7 to begin installation. Refer to the directions provided with the program if you need more specific information on how to respond to the prompts.

Note: This procedure creates a directory in Drive C: named dBASE and stores the program files in that directory. While this is the recommended directory, you may change the name of either the drive or the directory by typing over it the first time it appears.

1. Copy the number of the serial number on System Disk 1 onto a piece of paper.
2. Insert the installation disk in Drive A:.
3. Type A: if the A: drive is not already active. (If it is active the cursor will follow an A: > prompt.)
4. Type Install and press .


Note: The RETURN (ENTER) key is represented by the  symbol throughout this Ready Reference Manual.


5. Press  when the copyright screen appears.
6. When prompted, remove the disk in Drive A: and insert the requested disk.
7. Respond to each prompt and press  to proceed to the next prompt. When done with each prompt sequence, hold down CTRL and press END to save your entries and proceed to the next prompt sequence.
8. After loading the last disk, insert the installation disk, use the appropriate arrow key to highlight *Exit to DOS*, and press .


SETTING UP A BATCH FILE TO CHANGE THE dBASE IV DIRECTORY

Once installed dBASE IV, it is worthwhile to take the time to set up a batch file to change the dBASE IV directory. It eliminates the need to change to the dBASE IV directory manually each time dBASE IV is executed. More important, it also causes dBASE IV to store your data in a separate directory from the dBASE IV program files.

Note: If you are using floppy disks instead of a hard disk, replace the C: with the appropriate drives (A: or B:).






1. Type CD \dbase from the C: > prompt; press .

Note: If the dBASE IV program is stored in some other directory, use the name of that directory instead. For example, if it is in the root directory, type cd\ at the C: > prompt and then press .


2. Type MD to make a directory. (Do NOT press .)
3. Type \DBASE\name, inserting in place of the word “name” the name that you wish to assign to the subdirectory containing the dBASE IV files and data.



Example: MD \DBASE\DBFILES.

4. Press .

5. Type COPY CON DBASE.BAT and press  .
The cursor will move to the next line on the screen.
6. Type PATH = C:\DBASE then press  .
The cursor will move down one line.
7. Type CD\DBASE\name using the same name as assigned in step 3; press  .
The cursor will move down one line.
8. Type DBASE and press  .
9. Press F6 and  .
The message *1 file copied* should appear.

Entering dBASE IV

If you did not create a batch file by using the previous procedure in this section, begin by typing `cd \dbase` at the `C: >` prompt and then pressing .

1. Type dBASE and press  .
Two introductory screens appear. The first identifies the product as dBASE IV. The second contains copyright information entered when the product was installed.
2. Press  .
The Control Center screen appears.

The Control Center

The Control Center is used to select dBASE IV activities. The top line of the screen consists of a menu bar with three menu options: *Catalog*, *Tools*, and *Exit*. Press F10 to activate the menu bar.

Catalog option is used to select a different catalog, provide or edit the catalog description, change a catalog name, add a file to a catalog, remove a file from a catalog, or change the description of a file.

Tools option is chosen when you wish to access macros, import other files, export dBASE IV files, access DOS utilities, protect data, or change various default settings.

Exit option is used to exit to the dBASE IV dot prompt or to leave the program and return to DOS.

The name of the active catalog appears just below the screen title *dBASE IV Control Center*. The catalog contains all of the files related to a specific activity or owned by a specific user. For example, a catalog containing inventory data and queries might be named *INVEN*. Be sure that the active catalog is the one that you wish to use. If it is not, select another catalog by accessing the *Catalog* menu.

The File Panels

Most of the Control Center screen is occupied by six vertical columns called *file panels*.

Data Queries Forms Reports Labels
Applications

The **Data** panel displays the names of the dBASE IV files that contain data or information. The remaining panels contain files that describe how to arrange this information for viewing or reporting.


The **Queries** panel contains the names of different Query formats that you have created to display different types of information.

The **Forms** panel lists the names of files that you have created to customize the appearance of the data entry area. The customized form appears when data is entered, viewed, or edited.

The **Reports** panel contains the names of the files that describe different report formats to be applied to the data.

The **Labels** panel displays the names of files that create mailing labels.

The **Applications** panel lists files that generate custom dBASE IV programs. Each program performs a specific task, for example, calculating the amount of inventory on hand and printing an inventory listing. Usually these will be programs that you have written and then stored for later use.

When you first enter dBASE IV, each of these panels contains only the word *< create >*. When you create a file, you position the cursor in the appropriate panel, highlight this word, and then press  to begin the process described in the chapter titled Creating Databases.

Status Bar

There are two lines of information displayed at the bottom of the screen: the Status Bar and the Navigation Line. The Status Bar displays the following information, left to right, above the navigation line:

current screen abbreviated path cursor location datafile toggle
settings

The Status Bar is displayed immediately above the navigation line and displays the status of the Insertion, Deletion, Num Lock and Caps Lock keys.

Navigation Line

The Navigation Line reminds you which function keys are active.

Help:F1 Use:  Data:F2 Design:Shift-F2 Quick Report:
Shift-F9 Menus: F10