IRWIN
ADVANTAGE
SERIES FOR
COMPUTER
EDUCATION

HUTCHINSON
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Paradox® 4.0/4.5

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THE IRWIN ADVANTAGE SERIES
FOR COMPUTER EDUCATION

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USING THIS GUIDE

This tutorial is one in a series of learning guides that lead you through the most popular microcomputer software programs available. Concepts, skills, and procedures are grouped into session topics and are presented in a logical and structured manner. Commands and procedures are introduced using hands-on examples, and you are encouraged to perform the steps along with the guide. Although you may turn directly to a later session, be aware that some sessions require, or at least assume, that you have completed the previous sessions. For maximum benefit, you should also work through the short answer questions and hands-on exercises appearing at the end of each session.

The exercises and examples in this guide use several standard conventions to indicate menu options, keystroke combinations, and command instructions.

MENU INSTRUCTIONS

In Paradox 4.0 and Paradox 4.5, all Menu bar options and pull-down menu commands have a highlighted letter in each option. When you need to execute a command from the Menu bar—the row of menu choices across the top of the screen—the tutorial's instruction line separates the Menu bar option from the command with a comma. For example, the command for quitting Paradox is shown as:

CHOOSE: Exit, Yes

This instruction tells you to choose the Exit option on the Menu bar and then to choose the Yes command from the Exit pull-down menu. The actual steps for choosing a menu command are discussed later in this guide.

KEYSTROKES AND KEYSTROKE COMBINATIONS

When two keys must be pressed together, the tutorial's instruction line shows the keys joined with a plus (+) sign. For example, you execute several keyboard shortcuts using the function keys in coordination with the Alt and Ctrl keys.

To illustrate this type of keystroke combination, the following statement shows how to clear the desktop:

PRESS: Alt+F8

In this instruction, you press the Alt key first and then hold it down while you press F8. Once both keys have been pressed, they are then immediately released.

COMMAND INSTRUCTIONS

This guide indicates with a special typeface data that you are required to type in yourself. For example:

TYPE: `George Washington`

When you are required to enter unique information, such as the current date or your name, the instruction appears in italics. The following instruction directs you to type your name in place of the actual words: "your name."

TYPE: *`your name`*

Instructions that use general directions rather than a specific option or command name appear italicized in the regular typeface.

SELECT: *an appropriate column width*

ADVANTAGE DISKETTE

The Advantage Diskette, provided with this guide or by your instructor, contains the files that you use in each session and in the hands-on exercises. This diskette is extremely important for ensuring the success of the guide.

If you are using this guide in a self-study program, we suggest that you make a copy of the Advantage Diskette using the DOS DISKCOPY command. When the guide asks you to insert the Advantage Diskette, you insert and work with the copied diskette instead. By following this procedure, you will be able to work through the guide again at a later date using a fresh copy of the Advantage Diskette. For more information on using the DISKCOPY command, please refer to your DOS manual.

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SESSION 1

PARADOX 4.0/4.5: FUNDAMENTALS

Modern database management systems for microcomputers enable you to store and manage large amounts of data. Whether your computer is used to track inventory products, issue invoices, manage personnel records, or store phone numbers, you will find a computerized database management system a welcome addition to your software library. This session introduces you to the fundamentals of working with Paradox, a powerful and very popular database management software program.

PREVIEW

When you have completed this session, you will be able to:

Describe the features of a database management system.

•

Describe the components of Paradox.

•

Load Paradox.

•

Navigate and choose commands from the menu system.

•

Access the Paradox Help facility.

•

View and edit information in a Paradox database.

•

Use the UNDO command to reverse editing mistakes.

•

Exit Paradox.

SESSION OUTLINE

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What Is a Database Management System?
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WHY IS THIS SESSION IMPORTANT?

This guide leads you step-by-step through versions 4.0 and 4.5 of Paradox, a powerful relational database management program developed by Borland International. You can not only store and manage large amounts of information, but also create custom forms, reports, presentation quality graphs, and independent applications using Paradox. By the completion of this guide, you will have the fundamental skills for working with Paradox.

In Session 1, you learn how to load Paradox, navigate the menu system, view and edit a database, and access the Help facility. After creating a new database in Session 2, you add records to the file, view the database, sort the data in ascending and descending order, and then modify the database structure. Session 3 introduces querying the database for specific data, performing calculations, and linking databases. Session 4 provides lessons on presenting information using custom reports and mailing labels. The last session in this guide, Session 5, discusses some advanced topics including custom forms, graphs, file management, and programming.

This first session explains the features of a microcomputer-based database management system and teaches you the fundamentals of using Paradox to view and edit information in a database.

Before proceeding, make sure the following are true:

1. You have access to Paradox 4.0 or Paradox 4.5 for DOS.
2. Your Advantage Diskette is inserted into drive A:. Throughout this guide, you work with files on the disk that have been created for you.

WHAT IS A DATABASE MANAGEMENT SYSTEM?

Database management is the process of managing information. For example, imagine that you are responsible for managing the filing cabinets in a sales office. Each filing cabinet has multiple folders containing customer information, organized in alphabetical order by surname. Everything is perfectly organized and you know exactly where to look to find information on each customer. Great! But what if you need to compile a report on all your customers who live in Boston? Or produce a list of all customers who have purchased products in the past six months? Your

alphabetical organization scheme wasn't designed to answer these types of questions. As you can see, a manual filing system has many limitations. What you need is a computerized database management system! A **database management system (DBMS)** is a software tool that facilitates creating, maintaining, and manipulating an information database.

As with any software package, you must be familiar with the concepts and features of a DBMS before you can use it productively. Some of the more important terms to understand are:

- *Database* — A collection of related information. For example, a phone book is a database of names, addresses, and phone numbers. (*Note*: Although the term **database** is often used to refer to a single disk file, it actually includes all the related files—data files, reports, forms, and indices.)

- *Data File* — A single disk file that stores related information on a hard disk or floppy diskette. A phone book database would be stored in a single data file. (Also called a *table* in Paradox.)

- *Record* — An individual entry in the database. For example, each person's name, address, and phone number is a single record of information in a phone book. A database or data file is composed of records.

- *Field* — A piece of information in a record. For example, you can divide a person's record in the phone book into fields for their last name, first name, address, city, and phone number. A record is composed of fields.

A database application is any task that would be handled manually using a filing cabinet. A computerized DBMS is preferable to a manual filing system when there are many records to maintain or summarize, or when there are many details or fields to store for each record. The primary purpose of a DBMS is to translate large amounts of raw data into accurate, relevant, and well-organized information.

There are two distinct types of DBMS software available: relational and flat-file. A **relational database program** allows you to work with several database files at the same time and share information. To implement an accounting database system, for example, you require relational capabilities to link together information in the various ledger files. A **flat-file database**

program, on the other hand, allows you to create many databases but only work with one file at a time. Using a flat-file database program, you can create simple applications such as a mailing list database or a personnel file. Paradox is a relational database program.

WORKING WITH PARADOX

Paradox is a microcomputer-based DBMS that can be used as a stand-alone system or as part of a network environment. Paradox employs tables as the primary element for storing and manipulating information. Each table has an associated family of objects, including forms, reports, and indices. Although they are not part of its immediate family, a table may also have related graph and script objects. This collective group of objects ensures a truly integrated database environment. In this section, you learn about some of the more common Paradox objects and procedures.

TABLES

In Paradox, you arrange, store, and display information using tables. A **permanent table** is a database file that is stored on the disk. A **temporary table** is an intermediary table created by Paradox during a database operation, such as querying a database. Although temporary tables also appear on the disk, they are constantly overwritten during a Paradox session and they are erased from the disk when you leave Paradox.

Data in a table is organized into rows and columns, similar to a spreadsheet. Each row in a table represents an individual record, while each column represents a field or category of information. In one table, you can store millions of records with up to 255 fields per record! The number of tables allowed in Paradox is limited only by your computer hardware.

IMAGES

A Paradox object, such as a table, report, or form, appears onscreen as an **image**. When you work with an object, you are actually working with its image as opposed to its disk file. For example, you view or modify information in a table by first placing its image in a window on the screen. Because you can open multiple windows on the Paradox *desktop*, you can work with several images at the same time. When completed, you save the

changes back to the object's file on the disk. In Paradox 4.0, you are limited to placing 24 images on the desktop, while Paradox 4.5 allows 60 images.

To move among windows or images on the desktop:

- PRESS: F3 (Up Image key) and F4 (Down Image key), or
  PRESS: Ctrl+F4 (Next Window key) to move to the next window
- CLICK: the window that contains the desired image
- CHOOSE: ≡, Window or ≡, Next

FORMS

You display data from a Paradox table in a Table View window or a Form View window. The **Table View window** arranges data into rows and columns, allowing you to see up to 20 records on the screen. However, you rarely see all the fields at the same time without horizontally scrolling the table. The **Form View window**, on the other hand, attempts to display all the fields for a single record on the screen. To switch between the Table View window and the Form View window, you press the Form Toggle key (F7). (*Note*: A toggle key acts like a light switch that you can turn either on or off. With the Form Toggle key, you quickly move back and forth between two views of your data by pressing F7.)

Along with the standard form Paradox creates, you can design up to 14 additional custom forms for each table. A custom form may show a single record from one table, multiple records from one table (called a *multi-record form*), or multiple records from multiple tables (called a *multi-table form*). The process for creating custom forms is examined in Session 5.

QUERIES

Imagine having to wade through endless filing cabinets and folders to find all the orders placed by a single customer. Even with a computerized database, the job of scrolling thousands of records for this information is equally tedious. Fortunately, most computerized DBMS programs have quick methods for searching a database and retrieving specific information.

In Paradox, you extract information by placing a special statement on a Query Form. A query statement is constructed to ask questions about your data, perform calculations, and establish relational links to other tables. Queries are also useful for changing information in a group of records or deleting selected records. Querying is discussed in Session 3.

REPORTS

Paradox provides two report formats for presenting data: tabular and free-form. The most common format is a tabular report that prints one record per row underneath field or column headings, similar to the Table View window. For greater flexibility, you use the free-form report format to design mailing labels, pre-printed forms, and form letters. By default, Paradox automatically creates a tabular report for each table. In addition to this standard report, you can design 14 custom reports per table.

To quickly obtain a printed copy of the standard report, you turn on your printer, open a Table View window for the table, and press the Instant Report key (Alt+F7). Reports are discussed in Session 4.

GRAPHS

Paradox enables you to chart information from your tables in a variety of graph formats, including line, area, bar, rotated bar, stacked bar, 3D bar, X-Y, and pie. You enhance a chart by selecting fonts for titles, fill patterns and colors for data series, and other customizing options. Using scripts, you can even create an onscreen slideshow presentation of your data.

To produce an instant graph of your data onscreen, you position the cursor in a table and press the Instant Graph key (Ctrl+F7). Graphs are discussed in Session 5.

SCRIPTS

Some database operations, such as printing reports or retrieving information, are frequently executed. For example, you may print the same report every day or combine information from your regional offices into a national table each week. Using Paradox scripts, you can record the keystrokes used in performing these routine procedures and save them for later playback. When you need to execute the same operation again, you simply choose the script that you want Paradox to play.

Like macros in other applications, scripts save you time and boost your productivity. Session 5 lets you practice creating and playing back scripts.

PAL

The Paradox Application Language or PAL is a high-level, structured programming language. Using PAL and the Paradox Runtime module, you can develop complete database applications that not only extend the power of scripts, but run on systems that do not have Paradox. The Paradox Runtime product is sold separately from Paradox.

For those people who require a customized application but who are not experienced programmers, Paradox provides the Paradox Application Workshop (called the Personal Programmer in previous versions). The Application Workshop is a script generator that allows you to create complete programs by answering questions about your application. Although mentioned in Session 5, these topics are not covered in this guide.

STARTING PARADOX

Because Paradox requires approximately 5 MB of disk capacity, this session assumes that you are working on a computer with DOS and Paradox loaded on the hard disk drive. In most cases, the hard disk of a personal computer is drive C:. The Paradox program files are stored in a directory on the hard disk called \PDOX40 (for version 4.0) or \PDOX45 (for version 4.5), much like having a reserved drawer in a filing cabinet.

To start Paradox, perform the following steps on your computer.

1. Turn on the power switches to the computer and monitor. The C:\> prompt or a menu will appear announcing that your computer has successfully loaded DOS. (*Note*: DOS is an abbreviation for Disk Operating System, a collection of programs that manage your computer's resources. Every IBM-compatible microcomputer needs to load DOS before it will let you enter commands or run a program.)

2. To load Paradox into the computer's memory from the C:\> prompt, you must first move to the Paradox directory:
   TYPE: `cd \pdox45`
   PRESS: Enter
   (*Note*: For Paradox 4.0 users, type: `cd \pdox40` and press Enter.)