



Paradox[®] 9

User Guide

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WELCOME TO PARADOX 9

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Welcome to Paradox® 9, a powerful and easy-to-use relational database program that helps you organize, track and retrieve information. You can also create sophisticated forms, charts and reports to display your information. You can run Paradox as a standalone system on a single computer, or as a multi-user system on a network.

The power and flexibility of Paradox let you create a database that organizes and tracks important information. With a few clicks of the mouse, Paradox provides you with the tools to effectively control the expanding volumes of data you work with daily. By organizing data into easily accessible, linked tables, you can streamline repetitive tasks, eliminate redundancy, and increase your personal and business productivity.

Paradox Experts guide you through the process of creating the many different components that make up your database. Paradox provides experts for creating such objects as tables, forms, reports, charts, mailing lists, design objects, and queries. Or, if you prefer, you can create these objects on your own.

As well, with its Query By Example capabilities, you can gather information from multiple tables without writing a single line of code. Once you locate the desired information, you can create professional, up-to-the-minute charts and reports. If you prefer to create SQL queries, you can use the Visual Query Builder.

ObjectPAL®, the object-based, event-driven language, will help you customize your database, and power users and developers can use the Application Framework to create customized applications in seconds.

About Corel Corporation

Corel Corporation is recognized internationally as an award-winning developer and marketer of productivity applications, graphics, and Internet software. We pride ourselves in delivering high-quality products by actively seeking your input. We use this feedback and respond quickly to you, the users of Corel products worldwide.

Corel ships its products through a network of more than 160 distributors in 70 countries worldwide. Corel is traded on the Toronto Stock Exchange (symbol: COS) and on the NASDAQ National Market System (symbol: COSFF).

For more information about Corel and our products, browse to our World Wide Web site at **www.corel.com**.

Installing Paradox 9

You must install Paradox before you run it for the first time. The Paradox Setup application makes it easy to install. You can also use the Setup application to:

- add components to your currently installed Paradox
- refresh files and configurations of your currently installed Paradox

Before installing, you should do the following:

- Close any open applications.
- Close any virus-detection application.
- Make sure your computer meets the system requirements which are listed below.

Paradox 9 system requirements

The following are the minimum system requirements for Paradox.

- Windows 95, Windows 98, or Windows NT 4.0
- 486 PC, 66 MHZ processor
- 16 MB Ram (32 MB Recommended)
- 100 MB hard disk space (95 MB for typical install)
- CD-ROM Drive
- VGA Monitor
- Mouse or Tablet

If you are using an edition of Paradox that includes a voice recognition application, your system requirements will differ from those listed above. For more information about voice recognition applications, see the Paradox online Help.

Setting up Paradox

The Paradox Setup application installs all the main applications and components.

- To change selections in the Paradox Setup application, click the Back button.

Click the Help button for more information when you make selections in the Paradox Setup application.

To Install Paradox applications

- 1 Insert the Paradox CD into the CD-ROM drive.

If the Paradox Setup screen does not display, click the Start button on the Windows taskbar, and click Run. Type D:\SETUP (where D is the letter corresponding to the CD-ROM drive) in the Open box.

- 2 Click Paradox 9 Setup.
- 3 If you want to read the Paradox Release Notes, click the Release Notes button. The Release Notes may contain installation tips that were not available at press time.
- 4 Click the Next button.
- 5 Read the Paradox license agreement, and click the Accept button. If you don't accept the license agreement, the Setup application terminates.
- 6 Type your full name and company name (if it exists), and click the Next button.
- 7 Type your Paradox serial number and click the Next button. The serial number is on the Paradox Product Authenticity Card.
- 8 Enable one of the following options:
 - Typical Setup—installs the most commonly used applications, utilities, and files, and is the recommended installation type for most users. Use this option if you're not sure which Paradox components you want to install. You can add and remove components afterwards.

- Compact Setup — conserves hard drive space by installing the minimum number of applications, utilities, and files needed to operate Paradox. Enable this option if you have little free disk space and require only the minimum components. This installation is often used for laptop computers.
 - Custom Setup — lets you choose which Paradox components to install. This option gives you the most control over the installation process. Choose this option if you need to install specialized components that are not included in the Typical or Compact installation setups.
- 9 If you want Paradox to read required files from the CD-ROM drive when you use applications, enable the CD-ROM Based check box. This option saves hard disk space, but requires you to insert the Paradox CD into the CD-ROM drive each time you want to run a Paradox application. Enabling this option also results in slower-than-normal performance.
- 10 Click the Next button and follow the installation instructions in the Setup Wizard.

When the installation is completed, you will be prompted to register Paradox electronically. For more information about registering, see “Registering Paradox” below.

Registering Paradox

Registering Paradox provides you with timely access to the latest product updates and to high-quality technical support.

The serial number on the Product Authenticity Card is proof that you own a legal copy of Paradox. You will need the serial number when you call Corel Technical Support, upgrade to a new version of Paradox, or order replacement discs.

You can register using any of the following methods:

- Fill out the electronic registration form which displays when the Paradox installation is completed. The information in the registration form will be sent to Corel electronically if you have Internet access or a modem on your system. If you prefer, you can print the electronic registration form, and mail or fax it back to Corel.
- Visit Corel on the World Wide Web, and complete the registration form at:
www.corel.com/support/online/registration.htm

Adding, deleting, and updating Paradox components

After installing Paradox, you can add components to the installation. After using the Typical installation option, you may discover that you need or want additional Paradox components.

You can also delete Paradox components to free up disk space or update components to refresh their configuration settings. Updating components also repairs Paradox if you have accidentally deleted application files.

To add components to a Paradox installation

- 1 Close any open Paradox applications.
- 2 On the Windows taskbar, click Start, Programs, Paradox 9, Setup and Notes, Corel Setup Program.
- 3 Enable the Add New Components button.
- 4 Click the Next button, and follow the installation instructions in the Setup Wizard.

To delete installed Paradox components

- 1 Close any open Paradox applications.
- 2 On the Windows taskbar, click Start, Programs, Paradox 9, Setup and Notes, Corel Remove Program.
- 3 Click the Next button, and follow the installation instructions in the Corel Uninstaller.

To update a Paradox installation

- 1 Close any open Paradox applications.
- 2 On the Windows taskbar, click Start, Programs, Paradox 9, Setup and Notes, Corel Setup Program.
- 3 Enable the Update Current Installation button.
- 4 Click the Next button.
- 5 Click the Install button.

Upgrading from previous versions of Paradox

Paradox can co-exist with earlier versions of Paradox on the same system, if you have enough disk space. The Paradox Setup application does not replace earlier versions of these applications, but make sure that you install different versions of Paradox in separate folders.

If you don't plan to use earlier versions of the applications, you can remove them from your hard drive to free up drive space.

To delete Corel® Paradox® 8

- 1 Close any open applications.
- 2 On the Windows taskbar, click Start, Corel Paradox 8, Setup and Notes, Corel Remove Program.
- 3 Click the Next button.
- 4 Click the Select All button.
- 5 Enable the Remove Modified Files check box.
- 6 Click the Next button, and follow the installation instructions in the Corel Remove wizard.

Using Paradox documentation

Paradox includes online and paper documentation to help you learn the program and use it efficiently.

The Paradox documentation set

Online Help	The online Help system enables you to retrieve all the information you need quickly, and then return to your work. Help appears in a separate window on your screen. For quick access, you can keep the Help window displayed on top of the application window.
ObjectPAL Online Help	In addition to the Paradox Online help, the ObjectPAL online help system provides information on the object-based, event-driven, visual programming language used to extend the power of Paradox. It provides in-depth explanations on the language elements and also provides reference tables and example code that you can paste directly into your editor window.
Online Tutorial	The online tutorial teaches you how to use Paradox. The tutorial is very useful for both beginners who want to learn Paradox and for users of previous versions who want to learn the new features in Paradox 9.
ObjectPAL Online Tutorial	The ObjectPAL online tutorial takes you through the basics of ObjectPAL. It is an essential tool for those who have never used ObjectPAL before and provides an excellent introduction to object-based programming.
Context-sensitive Help	The context-sensitive Help displays information that is relevant to the task you are currently performing. You access it by pointing to the item you want information on and pressing F1. Context-sensitive Help provides help for various dialog boxes and dialog box controls.
ToolTips	ToolTips provide information about menu items and toolbar buttons. ToolTips display in a balloon when you position the cursor over a menu item or toolbar button.

PerfectExpert	The PerfectExpert guides you through performing basic tasks and provides links to related help topics from the on-line user guide.
User Guide	The Paradox 9 User Guide contains most of the information from the online help. If you use Paradox 9 as part of WordPerfect® Office 2000, you can refer to the Paradox section of the WordPerfect Office 2000 User Guide for help.

We want your feedback

If you have any comments or suggestions about Paradox documentation, you can email them to paradoxprodmgr@corel.ca or mail them to the address listed below. Unfortunately, we won't be able to respond to your messages individually.

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Documentation conventions

Before you start using Paradox, it's important to understand the conventions used in the documentation.

Mouse conventions

The following are conventions related to using the mouse:

When you see this ...	Do this ...
Click File, New	Click the File menu with the mouse, and click the word New in the menu.
Click Format, Properties, Grid	Click the Format menu, click Properties, and click Grid from the submenu that appears.
Enable a check box	Click the check box to place a check mark or an "X" inside the box.
Disable a check box	Click the check box to remove the check mark or "X."
Select	Click to highlight.

Choose a filename from the Files Type list box Click the name of the file you want.

Right-click, and click Restructure Click the right mouse button, and click the Restructure command from the submenu that appears.

Keyboard conventions

The following are conventions related to keyboard actions:

When you see this ...	Do this ...
Press ENTER	Press the Enter key on your keyboard.
Press CTRL + SHIFT	Press the Control key and the Shift key at the same time.

Using online Help

The Help Topics dialog box provides five ways to find information. You can use the Contents page to select a topic, use the Index page to search for a topic, or use the Find page to search for specific words and phrases in Help topics. Use can use the Ask The PerfectExpert page to type a question in your own words and Ask The PerfectExpert searches through the Paradox Help files and lists the topics that best answer your questions. And finally, you can use the Corel® Knowledge Base page to search for information on the Corel home page.

Paradox also comes with a help file specifically for users who use ObjectPAL, the object-based, event-driven, visual programming language used to support Paradox.

To access Paradox Online Help topics

- 1 Click Help, Help Topics.
- 2 Click one of the following tabs:
 - Contents—to browse through topics by category.
 - Index—to see a list of index entries, then type the first few letters of the subject about which you want information.
 - Find—to search for a particular word or phrase in the online Help.
 - Ask The PerfectExpert—to search for help in your own words.
 - Corel Knowledge Base—to search for information on the Corel home page.

To access ObjectPAL Online Help topics

- 1 Click Help, ObjectPAL Reference.
- 2 Click one of the following tabs:
 - Contents—to browse through topics by category.
 - Index—to see a list of index entries, then type the first few letters of the subject about which you want information.
 - Find—to search for a particular word or phrase in the online Help.

Accessing information from the Corel Web site

You can access the Corel Web site directly from Paradox. Using the Corel Web site, you can get information about projects and templates, 3rd Party Tools. You can also get technical support information, helpful tips and tricks, information about learning and certification, and information about service bureaus.

To access the Corel Business Application Community

- Click the Corel Community button on the Paradox Standard toolbar.

To get information from the Corel Web site

Click...	To get information about...
File, New From Project	Projects and templates
Tools, 3rd Party Tools Online	3rd Party tools
Help, Corel Web Site	Corel's Business Applications Community
Help, Corel On The Web, Technical Support	Technical support
Help, Corel On The Web, Tips And Tricks	Tips and tricks
Help, Corel On The Web, Learning And Certification	Learning and certification
Help, Corel On The Web, Approved Service Bureaus	Service bureaus

Accessing the online tutorials

The Paradox online tutorial provides lessons that teach you how to use many of the features of Paradox. It will provide you with the basic skills you'll require to start creating your own publications. If you are familiar with previous versions of Paradox, the tutorial will teach you how to use some of the new features in the program.

The ObjectPAL online tutorial provides lessons on the basic elements of ObjectPAL programming. By typing the code and reproducing the forms in the lessons, you will learn the syntax of the language.

To access the Paradox online tutorial

- Click Help, Paradox Tutorial.


To access the ObjectPAL online tutorial

- Click Help, ObjectPAL Tutorial.

Accessing context-sensitive Help

You can access context-sensitive Help from the menus, dialog boxes, and toolbars in Paradox.

The most common ways to access context-sensitive Help are as follows:

To get help on ...	Do this ...
Menus and toolbar buttons	Position your cursor over the menu item or toolbar button for Tooltip information.
Dialog boxes	Click the Help button in the dialog box. Press F1.
 Dialog box controls	Click the What's This Help button in a dialog box, then click the dialog control for which you want help. Right-click the control, and click What's This?. Right-click the control

Printing Help

You can print specific Help topics or print entire sections of online Help.

To ...	Do this ...
Print an entire section	On the Contents page, select the section you want to print, then click the Print button that appears at the bottom of the Help dialog box.
Print a selected topic	Click the Print button at the top of the Help window, or right-click the window and click Print Topic.

Using the Corel Reference Center

The Corel Reference Center contains online manuals in Adobe Acrobat Portable Digital File (.PDF) format. You can search the manuals to quickly find the information you need.

If you installed WordPerfect® Office 2000, the Reference Center contains online manuals for the whole suite and jPdox® Web Utilities. If you installed Paradox 9, the Reference Center contains online manuals for Paradox and jPdox Web Utilities.

To access the Corel Reference Center from Paradox

- 1 Click Help, Help Topics.
- 2 Click the Contents tab.
- 3 Double-click Reference information.
- 4 Double-click View Manuals.
- 5 Double-click Go to the Reference Center.

To access the Corel Reference Center from Windows

- 1 Click the Start button on the Windows taskbar.
- 2 Click one of the following (depending on your installation):
 - Programs, WordPerfect Office 2000, Setup & Notes, Corel Reference Center.
 - Programs, Paradox 9, Setup & Notes, Corel Reference Center.



- You can find the Corel Reference Center (refcntr.exe) in the folder \Corel\SHARED\REFCNTR on the WordPerfect Office 2000 CD-ROM and on the Paradox 9 CD-ROM.
- If you did not install the Corel Reference Center when you installed WordPerfect Office 2000 or Paradox 9, you can do so by performing a custom install.
- The jPdox Web Utilities manual contains information on Paradox® Web Form Designer, Paradox® JDBC Server, the Paradox Report® Server (and Dynamic Publishing), JDBC Proxy Server, JRun, and InstallAnywhere.

Viewing program and system information

Paradox provides easy access to information about the program, license information, and your system.

Program information consists of the application name, version number, serial number, and user name. This information doesn't change. You'll find it particularly useful if you ever need help from Corel Technical Support Services.

System information consists of details about any of the following categories: system, display, printing, Corel .EXE and .DLL files, and system .DLL files. For example, you can see how much memory you have on the drive to which you want to save a file. You can save any system information in a text file called SYSINFO.TXT.

To view product and license information

- 1 Click Help, About Paradox.
- 2 Click one of the following buttons:
 - Copyright
 - License

To edit the serial number and PIN

- 1 Click Help, About Paradox.
- 2 Click the Edit Serial/PIN button.
- 3 Type the serial number in the Serial Number box.
- 4 Type the Personal Identification Number in the PIN box.

To view program and system information

- 1 Click Help, About Paradox.

The About Paradox dialog box displays the version number and registration information for your software.
- 2 Click the System Info button to view system information.
- 3 Choose a category from the Choose A Category list box.



- Use the Save button in the System Info dialog box to store system information for printing. System information is saved as SYSINFO.TXT. A message box tells you where the file is saved.
-

Using the PerfectExpert

Paradox comes with its own built-in expert which is ready to help you with many tasks. The PerfectExpert includes the best features of QuickTasks, templates and Coaches, combined with information from online Help and the power of a natural language interface to assist you with everyday tasks. The PerfectExpert allows you to quickly create complex documents using professionally-designed templates.

To use the PerfectExpert

- 1 Click Help, PerfectExpert.
- 2 Click on any of the tasks available in the PerfectExpert.
These tasks will change depending on the function Paradox is performing.
- 3 Click the More Help On button for additional information.

Exploring the work area

The desktop is the first thing you see when you launch Paradox. It is the primary Paradox workspace. From the desktop, you can

- manage files
- define defaults and preferences
- control all Paradox objects
- set object properties

Many of the preferences you define remain in effect for a full Paradox session from the time you open Paradox until you exit. Paradox lets you save other preferences permanently.

Paradox objects such as forms, reports, and queries open in their own window. For example, forms always appear in a Form window, and queries always appear in a Query window. Each type of window contains specialized commands that apply only to that type of object or document.

Paradox Experts

Paradox Experts provide easy-to-follow steps that help you quickly perform common Paradox tasks.

To access Paradox Experts

- Click Tools, Experts

This command allows you to launch the following Experts:



The Chart Expert helps you create a chart of your data.



The Crosstab Expert helps you create a crosstab from your data



The Database Expert selects a ready-made database and helps you customize it.



The Documentation Expert produces a report on the structure and coding of your documents and objects



The Find Duplicate Expert helps you maintain your database by finding records with duplicate fields values in a single table. This is only works with a Paradox table (*.db).



The Form Expert helps you create a form that displays data from one or two tables in a variety of predefined layouts and styles.



The HTML Import Expert helps you import data from HTML documents.



The Launcher Expert creates a small tabbed form you can use to open or launch selected forms, reports, queries, scripts, and executable files with the click of a button.



The Mailing Label Expert helps you create mailing labels in a variety of mailing label formats.



The Merge Expert helps you merge data from a table into a form letter using a variety of word processors.



The Query Expert helps you find, correlate, and view information in your database. This is only works with a Paradox table (*.db).



The Report Expert helps you display and print data from one or two tables in a variety of predefined layouts and styles.



The Search and Replace Expert helps you change the underlying source code of several Paradox files simultaneously.



The Table Expert helps you create a new table from a list of table templates.



The Text Import Expert helps you import fixed length or delimited text into Paradox tables



The Utilities Expert helps you edit and update a group of documents simultaneously

Toolbars

Paradox toolbar buttons change depending on the toolbar type and the kinds of windows open. For example, if a table is open, the Standard toolbar buttons help you perform tasks with the table. Toolbar buttons provide quick equivalents to menu commands or keystrokes.

To get quick help on what a tool or button does, hold the cursor over the button. Paradox displays a tooltip that contains a description of the button.

Toolbars can be moved away from their standard position at the top of the screen. You can drag them around the screen and dock them at either side or at the bottom of the screen, or you can let them float. You can also display or hide any toolbar.

Paradox provides you with the following toolbars:

Standard toolbar



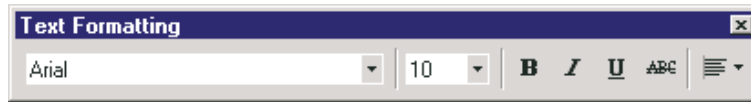
This is the default toolbar which usually appears immediately below the menus. This toolbar displays buttons and tools which are shortcuts to menu commands for the current active window such as cut, paste, copy, and print.

Property toolbar



The Property toolbar contains buttons which are useful for navigating around your database. This toolbar contains buttons to let you quickly filter a table, open database objects such as forms and reports, locate table records, switch to Design mode in a form or report, and switch between editing and viewing a table.

Text Formatting toolbar



The Text Formatting toolbar displays buttons and tools which are shortcuts to commonly used menu commands which deal with text. Therefore, its buttons do not change when the active window changes. This means that some buttons on this toolbar will not have any effect if the currently selected object does not support that action. For example, if you are designing a query and select some text, clicking the Bold tool will have no effect. The Text Formatting toolbar does not appear by default.

Align toolbar



The Align toolbar, which only appears when the Form Design or Report Design windows are open, provides shortcuts for aligning multiple objects that you have selected. The Align toolbar does not appear by default.

Design Object toolbar



The Design Object toolbar displays buttons for various tools used when designing a form or report, and only appears when the Form Design or Report Design windows are open. Using the Design Object toolbar you can create and add such objects as buttons, fields, frames, charts, or graphics to forms and reports.

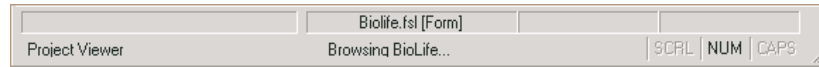
ActiveX Control toolbar



The ActiveX Control toolbar contains OLE Controls you have added to the toolbar. (OLE controls are purchased separately from third-party vendors.) The native Windows controls included with Paradox also appear on this

toolbar. These include the List Box, Combo Box, Spin Box, Progress Bar and Track Bar controls. The ActiveX Control toolbar does not appear by default.

Status Bar



Displays information about the current file, the selected object, or the action you are performing. Its default location is the bottom of the Application Window, but you can position it at the top of the Application Window. You can also hide the Status Bar, or change the information it displays.

Moving, docking and displaying toolbars

You can move a toolbar from the top of the desktop and dock it on either side or the bottom of the window, or you can let the toolbar float in its own window which you can drag to any place on the desktop. You can also hide or display any toolbar.

To move a toolbar

- Click a toolbar (click within the toolbar but not on a button) and drag it to a new location.

To dock a toolbar

- Click a toolbar (within the toolbar but not on a button) and drag it to the edge of the desktop until a dashed outline appears and the toolbar changes shape. Release the mouse button when the outline touches the edge of the window.

To let a toolbar float

- Click the appropriate toolbar (click within the toolbar, but not on a button) and drag the toolbar to the middle of the desktop. When you release the mouse button, the toolbar appears in its own window which you can drag to any area of the desktop.

To display a toolbar

- 1 Click View, Toolbars.
- 2 In the Toolbar Preferences dialog box, enable the check box beside each toolbar that you want to display.

To manipulate the Status Bar

- Right-click the Status Bar and choose Hide Status Bar, Position, or Size to manipulate its location and size.

Technical Support and Services

Paradox 9 is supported by the Corel Client Services team which is committed to provide quality customer service and support that is easy to access and convenient to use, while fostering one-to-one customer relationships.

If you have a question about the features and functions of Paradox 9 applications, look in the *Paradox 9 User Guide* (which you are reading), consult the Paradox online Help, or review the manuals in the Reference Center. You can also find updates and technical information in the Release Notes that were not available at press time.

To view the Release Notes

- On the Windows taskbar, click Start, and then click one of the following (depending on your installation):
 - Programs, WordPerfect Office 2000, Paradox 9, Setup and Notes, Release Notes.
 - Programs, Paradox 9, Setup and Notes, Release Notes.

Technical support on the World Wide Web

The World Wide Web address for Corel on the Internet is **www.corel.com**. Users in Germany can use **www.corel.de** and users in Ireland can use **www.corel.ie**. From Corel's home page, you can use a variety of support options.

Support Newsgroups

The Corel Support Newsgroups, accessible from the Corel Web site, are intended to let users exchange information, tips, and techniques with other users of Paradox applications. The newsgroup is located at **www.corel.com/support/newsgroup.htm**.

Corel Knowledge Base

From Corel's searchable Knowledge Base, you can read, print, or download documents that contain answers to many of your Paradox technical questions or problems. The Knowledge Base is located at **kb.corel.com**.

File Transfer Protocol (FTP)

You can download printer drivers, patches, plugs, updates, or other files located on the anonymous FTP site at **ftp.corel.com**. For information about this site, see **www.corel.com/support/ftpsite/ftpindex.htm**.

Other Paradox 9 support options

Corel offers the following technical support options, most of which are available 24 hours a day, 365 days a year. These services are useful if you prefer not to pay for support or if you encounter problems during off-hours.

IVAN (Interactive Voice Answering Network)

The Interactive Voice Answering Network provides answers to commonly asked questions about Corel products and is available 24 hours a day, 365 days a year. It is regularly updated with the latest information, tips, and tricks. You can also request that IVAN solutions be faxed to you. There is no charge for this service beyond the cost of the telephone call. To use this service, call:

- North America (613) 728-1937
- Rest of world +353-1-708-2525, select option 1 (Ireland-based phone number)

Automated FAX On Demand

Technical Support maintains an Automated FAX On Demand system of numbered documents that contain up-to-date information about common issues, tips, and tricks. This service is available 24 hours a day, 365 days a year. To use this service, call:

- North America (613) 724-3456
- Rest of world +353-1-708-2525, select option 2 (Ireland-based phone number)

CompuServe

If you have a CompuServe membership, you can interact with other users and Corel volunteers to obtain product information and support. You can also quickly search Corel's technical information database for answers to many of your technical questions or problems, and download printer drivers and other files. CompuServe is available 24 hours a day, 365 days a year, including holidays. Corel volunteers respond from 8:30 a.m. to 5:00 p.m. Eastern Time, from Monday to Friday, excluding holidays.

To access Corel on CompuServe, enter **GO COREL** at the CompuServe prompt.

Bulletin Board System (BBS)

If you have a modem and a communications software package, you can access Corel's BBS. You can use the BBS to download files, including printer drivers, troubleshooting information, and utilities. You can also transfer problem files to Customer Support through the BBS. This option is available only outside North America. To access the BBS, call:

- +353-1-708-2700 (Ireland-based phone number)
- +31-10-4763232 (Netherlands-based phone number)

Telephone technical support options

Paradox users can use complimentary and fee-based telephone technical support options. Complete information about these options, including phone numbers, is available in the Support and Services online Help file. This online Help file explains the three levels of support that are available to you and your organization.

Classic Service

Classic Service is designed to address the technical support needs of Paradox users. This service helps users with basic installation and configuration issues.

Priority Service

Priority Service is a fee-based service for users that require the help of second-level technicians. Priority Service may be purchased by the minute, by the incident, or on a term basis. Options range from core business hour access for individual users, to around-the-clock access for multiuser environments.

Premium Service

Premium Service is Corel's highest level of support. This fee-based service is designed for organizations that want to establish a direct relationship with Corel and for organizations that employ dedicated support professionals or have centralized technical management.

To view the Paradox Support and Services online help

Do one of the following (depending on your installation):

- On the Windows taskbar, click Start, Programs, WordPerfect Office 2000, Paradox 9, Setup and Notes, Paradox Technical Support Help.
- On the Windows taskbar, click Start, Programs, Paradox 9, Setup and Notes, Paradox Technical Support Help.
- If you have not installed WordPerfect Office 2000 or Paradox 9, you can access Support and Services information for Paradox in the TECHSUPP.HLP help file on the WordPerfect Office 2000 or Paradox 9 installation CD. This help file is located at D:\Corel\Paradox folder (where “D” is the letter that corresponds to the CD-ROM drive).

Before calling Corel Technical Support

Before you call Corel Technical Support, please have the following information available to assist the Technical Support representative in helping you.

- A brief description of the problem, including the exact text of any error messages received, and the steps required to recreate the problem.
- The type of computer, monitor, pointing device (for example, mouse or tablet), printer, and video card (display adapter) you are using.
- The version number of Microsoft Windows you are using. To find the version number, in Windows Explorer, click Help, and choose About Windows 95, About Windows 98, or About Windows NT.
- The version number of the Paradox application you are using. To find the version number, click Help, About Paradox.
- List of any applications loaded into RAM. Check the Startup folder in the Programs menu to determine if you are running any other applications.

You must provide your Personal Identification Number (PIN) or serial number (found on the Product Authenticity Card) each time you call Corel Technical Support. This information is available in the About dialog box in Paradox.

To view and edit your serial number and PIN

- 1 Click Help, About Paradox.
- 2 Click Edit Serial Number/PIN.
- 3 Type your serial number.
- 4 Type your Personal Identification Number (PIN).

Professional Services

Corel Professional Services is a team of experienced professionals ready to assist you in implementing a complete technology solution and to realize your IT objectives by helping you:

- select and deploy new technologies without generating unexpected training, support and administration costs
- extend the life of your legacy hardware and software to maximize the return on your IT investment
- optimize the performance of your existing Corel technologies

Corel Professional Services offers a range of services including:

- planning and design
- development
- deployment
- support

You may choose to engage Corel Professional Services for some or all of these services, depending on the scope of the project and the availability of your company's resources. For more information about Corel Professional Services, visit **www.corel.com/support/professional** on the World Wide Web. If you would like a representative of the North American Corel Professional Services team to contact you, please e-mail **proservices@corel.ca**. Outside of North America, you can contact Corel Professional Services through e-mail at **dub-ps@corel.ie** or by phoning **353-1-7082580 (Dublin)**.

Customer Service

Corel Customer Service can promptly and accurately provide you with information about Corel product features, specifications, pricing, availability, and services. You can access Customer Service support through the following avenues.

World Wide Web

You can access general customer service and product information through the World Wide Web at **www.corel.com/support**.

Mail, fax, email

You can send specific customer service questions to Corel Customer Service representatives by mail, fax, and email.

Corel Corporation
Corel Customer Service
1600 Carling Ave.
Ottawa, Ontario
Canada
K1Z 8R7

Fax: 613-761-9176

E-mail: custserv2@corel.ca

Telephone

You can also telephone Corel Customer Service centers with your questions.

In North America, you can reach Corel Customer Service by calling our 1-800-772-6735 toll-free line. The hours of operation are 9:00 a.m. to 9:00 p.m., Eastern Time, Monday through Friday, and from 10:00 a.m. to 7:00 p.m. on Saturday.

Corel customers residing outside North America can contact Corel Customer Service representatives in Dublin, Ireland on a toll line at 353-1-706-3916 or by calling a local authorized Corel Customer Service Partner.

To view a listing of Corel International Customer Service telephone numbers

Do one of the following (depending on your installation):

- On the Windows taskbar, click Start, Programs, WordPerfect Office 2000, Setup and Notes, Technical Support Help.
- On the Windows taskbar, click Start, Programs, Paradox 9, Setup and Notes, Technical Support Help.
- If you have not installed WordPerfect Office 2000 or Paradox 9, you can access customer support telephone numbers in the TECHSUPP.HLP help file on the WordPerfect Office 2000 or Paradox 9 installation CD. This help file is located in the D:\Corel\Paradox folder (where "D" is the letter that corresponds to the CD-ROM drive).
- On the World Wide Web, visit www.corel.com/support.



GETTING STARTED

2

A database is a management system for information. Databases are widely used everyday, from telephone books to online library catalogs. Whether you develop databases for a large company or run a small business from your home, you can use Paradox to organize your information. Users new to databases can use the Experts to quickly create tables, forms, reports, charts, and queries. More advanced users can code their own databases using the ObjectPAL scripting language. Querying several tables at a time can be accomplished easily by using the Query By Example feature in Paradox or users familiar with query programming can use SQL (Structured Query Language).

If you are new to databases, become familiar with the concepts of fields, records, keys, and indexes. Once you understand these, you can create your own database. Learning how to maintain data integrity through the use of properties like referential integrity and validity checks will fine-tune your database and allow you to relate all the tables, forms or reports you have created.

Introduction to database systems

Paradox is a full-featured relational database management system that you can use either as a standalone system on a single computer or as a multi-user system on a network. Paradox lets you control the expanding volumes of data you work with daily and can manage your data at whatever level you need.

First-time database users want to be able to create a table quickly and easily, enter data in the table, retrieve data, and generate a report. These essential

tasks never lose their importance, but as your needs expand, the power of your database system must expand with them. Here are a few things to keep in mind as you create your database:

- It is important to be able to break data into small, easily managed tables. This is called data normalization. It is then important to be able to link tables so you can query data across several tables and create multi-table forms and reports. Paradox gives you the power to do this simply and quickly.
- The more you work with a system, the more you will want to customize it. At first, you may just want to enhance a report's visual appeal, or create customized forms for ease of data entry. Later, you may want to perform some tasks automatically or tie several tasks together.
- The rich set of Paradox design features can give you the exact look you want for your forms and reports. You can draw from the data in many tables, and add summary and calculated fields to make conclusions about the data. You can include charts and crosstabs of your data to inform with visual impact. Then you can add ObjectPAL code to objects on forms to create any function you need. You can even create buttons that you click to execute commands you define.

The ultimate power Paradox gives you is the ability to create your own database applications. You can use ObjectPAL to create a whole database application, define its menus, organize and structure the tables it uses, define the functions you want, and deliver the whole application. Once an application has been delivered, any ObjectPAL code is hidden from the user, so the customization of Paradox is complete.

Understanding relational databases

What is a relational database?

A database is an organized collection of information based on specific data. For example, you could create a simple database of your Compact Disk(CD) collection by organizing your data into specific categories such as artist, album titles, length, and price.

In a relational database like Paradox, data is organized into tables. Tables contain categories of data, repeated for each item in the table. Using the above example, if you structure the CD collection as a table, you might put artists in one column, album titles in another, length in another, and price in another. For each entry in your collection (each item in the table), you enter the same categories of data (artists, album titles, length, and price).

Suppose you also want to organize information about specific CDs, such as the songs on each CD, the length of each song, and the guest artists for

specific songs. You could store this information in a table, too. Just as you have two collections of data, you'd have two tables.

Flat-file databases

Some database systems look at only one table at a time. These are called flat-file systems. When you use this kind of system, the terms table and database mean the same thing. Using the example of the CD collection, you could see either the album titles and artists in one table, or album titles and songs on each CD in another. You would not be able to combine selected information from both tables.

Relational databases

In a relational database like Paradox, you can extract specific information from each table and assemble it in a meaningful way. For example, suppose you want to see a list that includes just each CD album title, artist, and songs on each CD. Using Paradox, you can link the CD collection table and the specific album information table by identifying a common field ("Album Title"). Then you are free to combine the kinds of information you want to see from both tables. For example, you could query the database and create an Answer table listing the album title, artist, and song titles. You can then save the query so that you can generate an up-to-date list any time. Paradox keeps the tables separate but understands there is a relationship between them. In a relational database like Paradox, the term database refers to all of your tables and all of their relationships.

Using common fields to relate tables prevents data duplication and makes data easier to maintain because an update in a single field can update information in many tables.

Relational systems may involve four types of table-to-table relationships:

- one-to-one
- one-to-many
- many-to-one
- many-to-many

If you are new to databases, you will find it useful to read "Case Study: the MAST company" in the Paradox online Help which illustrates how one company created its database.

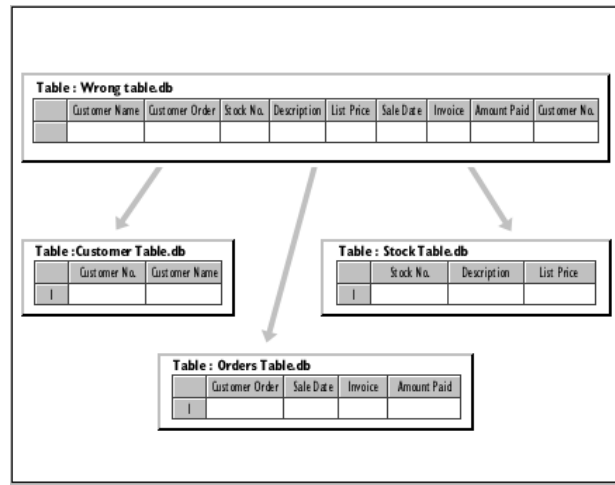
Understanding data normalization

Data normalization is the arrangement of data into separate tables in which each table contains the fewest number of fields necessary to establish unique categories. Rather than using one large, complex table that contains

numerous fields, normalized tables distribute information over many tables using fewer fields.

In a completely normalized database (the ultimate goal for any database), the only fields that are duplicated across your database are those that link tables. Normalized tables provide more flexibility in terms of analysis and are the key to creating an efficient database.

.....
An illustration of data
normalization.
.....



If you are new to databases, you will find it useful to read “Case Study: the MAST company” in the Paradox online Help which illustrates how one company created its database.

Understanding referential integrity

Referential integrity ensures that the links between like data in separate tables cannot be broken. This means that Paradox checks the validity of a value before accepting it. For example, if you establish referential integrity between your Customer and Orders tables on their Customer No. fields, and then enter a value in the Customer No. field of the Orders table, Paradox searches the Customer table and accepts or rejects the value depending on whether it is an existing customer number. When you create your tables, you will want to establish referential integrity among your tables.

In the following diagram, Paradox prohibits you from entering a value in the ORDERS.DB CustomerNo field that doesn't match an existing value in the CUSTOMER.DB CustomerNo field.

An example of
referential integrity.

The diagram illustrates referential integrity between two tables. The 'Parent Table' (Customer.db) contains customer information, and the 'Child Table' (Orders.db) contains order information. A line connects the 'Customer No.' field in the Orders table to the 'Customer No.' field in the Customer table, indicating that every order must belong to a valid customer.

Customer No.	Name	Street
1	J. J. J. J.	1234 Main Street
2	J. J. J. J.	5678 Main Street
3	J. J. J. J.	9012 Main Street
4	J. J. J. J.	3456 Main Street
5	J. J. J. J.	7890 Main Street
6	J. J. J. J.	2345 Main Street
7	J. J. J. J.	6789 Main Street
8	J. J. J. J.	0123 Main Street
9	J. J. J. J.	4567 Main Street
10	J. J. J. J.	8901 Main Street
11	J. J. J. J.	2345 Main Street
12	J. J. J. J.	6789 Main Street
13	J. J. J. J.	0123 Main Street
14	J. J. J. J.	4567 Main Street
15	J. J. J. J.	8901 Main Street

Order No.	Customer No.	Date
1	1	1/1/91
2	2	1/1/91
3	3	1/1/91
4	4	1/1/91
5	5	1/1/91
6	6	1/1/91

If you are new to databases, you will find it useful to read “Case Study: the MAST company” in the Paradox online Help which illustrates how one company created its database.



- For more detailed information on referential integrity, see “Referential integrity” on page 77.

Understanding keys and indexes

When you create a database table, one thing you must determine and then define is the table’s primary or composite key. A primary key determines the sort order for the table and helps prevent the duplication of records within your database because it does not allow you to enter duplicate data. For example, in a table containing customer information, you could define the Customer Name field as the primary key to sort the records alphabetically by name. The primary key must be the first field in the table.

A composite key is the same as a primary key except that it is composed of a group of initial table fields rather than a single field. Paradox sorts the table by the key, starting with the first field in the key and then sorting according to subsequent fields. Composite keys allow duplicate values within an individual key field as long as values are not duplicated across all fields. For example, if you defined the customer name and customer phone number fields as the composite key, you could enter two customers who have the same name, as it is possible in a large list of customers for two different

customers to have the same name. By also keying the phone number field, you will prevent users from entering the same customer twice.

When you establish a key, Paradox creates one or more files that contain an index of the field's values and their locations. This is why the primary key is also referred to as the primary index. While you, the user, never see this index, Paradox refers to the index file when locating and displaying the records in a table.

Paradox allows you to establish both primary and secondary indexes in any table.

The relationship between key fields and links

You link tables by defining a relationship between the fields of two tables. In other words, both tables must have an identical field. In one (or both) of these tables, that field must be the key field. With this relationship intact, the two tables can be linked by Paradox and you can manipulate data from both of them. This is called querying tables.

Both Paradox and dBASE let you create indexes to specify the order in which records are accessed. However, the way indexes work is different for Paradox and dBASE tables.

If you are new to databases, you will find it useful to read through “Case Study: the MAST company” in the Paradox online Help, which illustrates how one company created its database.



- For more detailed information, see “Defining key fields” on page 56 and “Indexes” on page 58.
-

Understanding links

In order to create an efficient, easy-to-maintain database, you need to create tables that can be linked together. The most common way of linking tables is through common fields. For example, in order to be able to link a customer information table with a customer orders table, you may decide to include a Customer No. field in both tables.

In order for Paradox to identify fields in two tables as identical, the following conditions must apply:

- The fields must have the same name, including capitalization.
- The fields must have the same field size.

- The fields must have the same field type.
- One of the fields must be a primary key in one of the tables.

When you meet these conditions, Paradox recognizes these fields as containing the same data. Then, whenever you update the information in one table, Paradox will update the information in all other tables containing that field, ensuring that data integrity is maintained across your database.

Linking your tables using common fields allows you to harness the power and flexibility of Paradox so that you can update, view, query, and create reports with ease.

If you are new to databases, you will find it useful to read “Case Study: the MAST company” in the Paradox online Help, which illustrates how one company created its database.

Understanding validity checks

Validity checks are rules you impose on different fields in your tables that require the data entered to meet certain criteria before Paradox will accept it as a valid entry. Validity checks help minimize data entry errors. Paradox allows you to impose many types of validity checks on a table’s fields. For example, you can specify maximum or minimum values for number fields, specify a default value for a field, or require that users enter a value in a given field before moving on to the next record. Implementing a few key validity checks in your database can increase productivity by decreasing the time it takes users to enter information (with appropriate default values) and greatly reduce the confusion caused by data entry errors.

If you are new to databases, you will find it useful to read “Case Study: the MAST company” in the Paradox online Help, which illustrates how one company created its database.



- For more detailed information, see “Validity checks” on page 63.
-

Understanding data models

A data model is the graphical representation of the relationships between tables. Data models provide a simple way of telling Paradox which tables’ data to display and work with and how these tables are linked.

Data models exist in two ways:

- As part of a form or report. When you create a form or report, you need to tell Paradox which tables to use and how the tables are linked (on which

fields). When you create a data model for a form or report, you use the Data Model dialog box.

- As a separate file. You can create a data model separately without creating a form or report. This type of data model is known as a reference data model; you can create data models separately for use at a later time. These data model reference files have a file extension of .DM, and are created using the Data Model Designer.

The Data Model dialog box and the Data Model Designer allow you to do exactly the same things. The only difference is that when you are creating a data model in conjunction with a form or report, Paradox opens the Data Model dialog box; when you are creating a data model separately, Paradox opens the Data Model Designer.

A data model can be based on a single table, or on multiple tables. To use information on a form, report, or query from more than one table, you must create a multi-table data model. You then define relationships between the tables to link them together.

You can create a data model independently of any form, report, or query, and use the data model dialog box to design a document or run a query.



- Before you can link tables to create a data model, you have to structure the tables correctly using keys and indexes. For information about keys and indexes, see “Indexes” on page 58.
 - For more detailed information on data models, see “Creating data models” on page 171.
-

Paradox sample directory

Your Paradox disks include sample files that you can choose to install with Paradox. The sample tables contain information used by the fictitious Marine Adventures and Sunken Treasure (MAST) company. This company sells diving equipment and supplies to dive shops around the world. For more information on the MAST company, the development of the MAST database, and the structures of the sample tables, see “Case Study: the MAST company” in the Paradox online Help.

The sample files are used in examples in this Help system. These files are located in the Sample directory (unless you specified otherwise when you installed them). If you installed Paradox in the default location, the full path of the samples files is C:\PROGRAM FILES\COREL\SHARED\SAMPLES.

To use these sample files, you must change your working directory to the Sample directory.

To set the working directory

- 1 Click File, Working Directory.
- 2 In the Set Working Directory dialog box, select the samples directory, or type C:\PROGRAM FILES\COREL\SHARED\SAMPLES in the file name box.

The ObjectPAL scripting language

ObjectPAL (Object Paradox Application Language) is an object-based, event-driven, visual programming language. You can use ObjectPAL to completely customized applications with entirely new buttons, menus, dialog boxes, prompts, warnings, and online Help. ObjectPAL can be used to extend the regular Paradox functions, or to create non-database applications.

ObjectPAL and Paradox are tightly integrated; the more you know about Paradox, the more you can take advantage of it in your ObjectPAL programming. If you think of ObjectPAL as a tool that extends the power of Paradox, you can discover ways of using the language to perform tasks that would be awkward, difficult, time-consuming, or impossible to perform without it.

ObjectPAL supports variables, control structures, such as IF, FOR, WHILE, LOOP, and many of the same data types as other programming languages. You can use methods and procedures supplied by ObjectPAL, or you can create your own custom methods and custom procedures.



- For more information on ObjectPAL see the ObjectPAL online help (click Help, ObjectPAL Reference) or for a step by step instruction on how to use ObjectPAL, see the ObjectPAL Tutorial (click Help, ObjectPAL Tutorial).
-

Understanding Paradox objects

In Paradox, the database components that store, display, retrieve, and present data are called objects. The main objects you work with in Paradox are tables, forms, queries, and reports. You might also work with ObjectPAL scripts and libraries, data models, or SQL files. In addition, Paradox offers a wide variety of design objects that you can use to customize your forms and reports. Paradox objects and design objects have attributes or characteristics called properties.

Paradox uses the following objects to store, display, and present information:

- files
- tables
- forms
- reports
- queries
- data models
- ObjectPAL scripts
- libraries
- SQL files

Design objects are objects you create with toolbar tools and place in forms and reports in a Design Window. Design objects include the following:

- text objects
- boxes, lines, and ellipses
- crosstabs
- charts
- buttons
- graphics
- OLE objects
- document pages

Each object has a different extension. For a list, see File extensions for Paradox objects in the Reference section of the online Help.

Understanding tables

Paradox stores data in tables. A table should represent a specific subject such as orders, courses, or employees. Tables consist of rows and columns. Each row contains related information about a particular person or item. For example, in a customer table a row of data might include the customer's ID number, name, address, and telephone number. This is called a record. Each column contains one category of the data that makes up a record. This is called a field.

The sample table below is named Phone.db. It has two fields (Name and Phone Number) and three records (Janet, Sue, and Doug).

	Phone	Name	Phone Number
1	1	Janet	304-988-2334
2	2	Sue	408-726-9910
3	3	Doug	303-568-3445

Temporary tables

Certain Paradox operations create temporary tables that last only until you change your private directory or end the Paradox session.

Paradox stores all temporary tables in your private directory. You can edit and query a temporary table as you would any other table. If you want to save one of these tables, you must rename it.

The following table lists the temporary tables Paradox creates when performing certain operations. Paradox places these tables in the private directory.

Name	Created during
ANSWER.DB	Query — contains results from a query
CHANGED.DB	CHANGETO query or Add operation (update) — contains unchanged copy of changed records
CROSSTAB.DB	Running a crosstab object in a form — contains results of a crosstab
DELETED.DB	DELETE query — contains deleted records
ERRORCHG.DB	CHANGETO query — contains records that could not be changed
ERRORDL.DB	DELETE query — contains records that could not be deleted
ERRORINS.DB	INSERT query — contains records that could not be inserted
INSERTED.DB	INSERT query — contains inserted records
KEYVIOL.DB	Restructure or Add operations (append) — contains records with duplicate key values and records that violate referential integrity rules
LOCKS.DB	Tools, Display Locks — contains all active locks on a table

PAL\$SRC.DB

View, Document Source — contains a list of source code, objects, and methods in your form

PROBLEMS.DB

Restructure or Import operations — contains unconverted records



- You should not use any reserved temporary table name as the name of an object you create, because Paradox deletes temporary tables (or tables with those reserved names) whenever you change your private directory or exit Paradox.
- If you perform more than one operation that results in this temporary table within one session, Paradox creates additional temporary tables with the same name and numbers them. For example, KEYVIOL1, KEYVIOL2, and so on.
- For more detailed information, see “Creating a Paradox table” on page 53.

Understanding forms

Sometimes it's more convenient to work with the data from your tables one record at a time, rather than with an entire table full of data. Forms let you see as much (or as little) of your data as you want in the format you prefer. The following figure shows a form created by Paradox that displays only one record at a time.

When you view data in a form, you see the same data as in the table, but Paradox arranges it differently. If you edit data in the form, Paradox updates the data in the table.

You can use Paradox design tools to create custom form layouts. You can design forms that display several records from a table or even records from several tables at the same time.



- For more detailed information, see “Creating and opening a form” on page 227.

Understanding reports

Many people want to see their data in printed reports. Paradox reports are flexible and powerful. You can sort and group records, calculate fields and totals, and arrange your data in various formats.

Reports, like forms, take advantage of Paradox design features and tools. Using these tools, you can customize your reports to look just the way you want. And, because it's so easy to link tables together, you can combine data

from several tables into one report that includes exactly the information you want.



- For more detailed information, see “Creating and opening a report” on page 246.
-

Understanding queries

A Paradox query is a question you ask about the data in your tables. You can use queries to

- find or select data from a table
- combine data from more than one table
- perform calculations on the data in a table

Paradox gives you a simple yet powerful way to ask questions about a table’s data called Query By Example (QBE). In the Paradox Query window, you choose which tables you want to ask questions about and then enter an example of the data you want. Paradox runs the query and generates an Answer table based on your example.

Paradox also allows you to run live queries that generate a live, editable view of the data you described in the query. When you edit the live query view, you actually change the data in the table you queried. Live query views give you a simple way to limit your view of data to just what you need to work with.



- For more detailed information on queries, see “Querying your database” on page 309.
-

Understanding ObjectPAL scripts, libraries, and SQL files

Scripts

Scripts are pieces of ObjectPAL code that you can create to perform operations automatically. (ObjectPAL is the Paradox application language.) ObjectPAL code is usually attached to objects in forms, but you can also create standalone scripts that perform operations you specify independently of a form. For example, you can write a script to open a particular table and perform a calculation on one or more of its fields. Paradox runs this type of script directly from the desktop, not from triggering an event on an object in

a form. For more information on writing scripts, see the ObjectPAL online Help.

Libraries

A library is an object you can use to store commonly used ObjectPAL code which lets you easily share code among forms, scripts, and other libraries. For more information, see the ObjectPAL online Help.

SQL Files

An SQL file is an object that contains code you write in SQL (Structured Query Language). For more information about using SQL with Paradox and about using Paradox to work with remote data, see *Connecting to the SQL server*.

You can use the SQL Editor to write SQL code to perform operations on remote data using Paradox SQL Link. You can also write query scripts using SQL that you can run on local Paradox or dBASE data.

Setting desktop and system preferences

Preferences are global settings that affect the overall performance of Paradox, and the default settings or values that appear for many of its operations.

To set desktop and system preferences

- Click Tools, Settings, Preferences.

The Preferences dialog box contains the following tabs and options:

General:

- Type a new title for the Paradox title bar.
- Add a bitmap to the Paradox Window background.
- Change the desktop state settings and default font.
- Choose to have the Project Viewer open on startup.

Tables:

- Choose whether you will always start with a blank table or use an Expert.
- Have the program ask you for confirmation when you specify a record deletion.

Forms/Reports:

- Specify whether you want to use a data model or Expert every time you make a new form or report.
- Determine the screen size of your form or report.
- Specify whether you want to open your form or report in Design mode.
- Select screen and printer style sheets.

Designer:

- Specify how to select design objects contained by other objects.
- Specify whether to display onscreen design objects with or without frames.
- Suppress screen flashes when you move or resize design objects.
- Specify what you see when you move or resize an object, the object itself or its outline.
- Specify how to measure and space grid lines.
- Specify which ruler to display in the Design Window.

Query:

- Determine what kind of access you and other users have to queries.
- Specify whether your query requires remote data on SQL servers.
- Choose whether you want Paradox to generate auxiliary tables when running queries that change data.
- Specify whether the Check or CheckPlus operator is the default check mark for choosing fields in a query.
- Control the update of SQL tables from live query views.

Toolbars:

- Enable the check box for each toolbar you want displayed.

Experts:

- Specify whether you want the Experts to open automatically and whether you want the Startup Expert to run.

Advanced:

- Specify warning prompts, ANSI character entry, expandable directory branches, and scroll bars in form windows.

Database:

- Specify a directory to use as your private directory.
- Choose whether you want Paradox to interpret blanks in calculated fields as the number zero.
- Determine how Paradox works on a network in terms of other users, how often you want your display refreshed, and the length of time you want Paradox to retry accessing tables from which you are locked out.

BDE:

- View the network control file directory, language and database drivers, buffer size, or local share.



- SQL Editor preferences are set on the Editor page of the Developer Preferences dialog box.
-

Setting ObjectPAL preferences

Preferences are global settings that affect the overall performance of Paradox and the default settings or values that appear for many of its operations. ObjectPAL Preferences are set using the Developer Preferences command.

You can set the ObjectPAL level that you're comfortable with on the General page. Choose Beginner to limit the range of ObjectPAL possibilities you view. This helps you understand more quickly how ObjectPAL works. When you're comfortable working in ObjectPAL, choose Advanced to see the full set of ObjectPAL features.

Setting general ObjectPAL preferences

Paradox lets you specify ObjectPAL desktop and system preferences.

To set general ObjectPAL preferences

- Click Tools, Settings, Developer Preferences.

The Developer Preferences dialog box contains the following pages:

General:

- Choose whether you want ObjectPAL Explorer and ObjectPAL Quick Lookup to show all the elements in the ObjectPAL language (Advanced) or simply a subset (Beginner).

- Choose to suspend execution by using CTRL + BREAK.
- Choose to define and use your own breakpoints.
- Choose to keep the debugger environment open in a Design Window.
- Open the debugger whenever you run a form.
- Extend your choice of menu options in the Form Design Window.

Object Explorer:

- Choose how you want Object Explorer to list methods/events.

Editor:

- Enable the check boxes that perform the operations you require. Choose the Use Default button to set your chosen options to the default of the current keystroke mapping.
- Specify the number of columns between tab stops.
- Specify the number of columns to indent.
- Specify the number of undo actions to store before undo action information is discarded.

Display

- Choose from three sets of keystrokes.
- Specify display options such as Hints and Save prompts.
- Choose font names and sizes.

Colors

- Specify foreground and background colors for anything listed in the Elements list box or choose default settings.
- Specify text attributes.



- If you enable the Show Developer Menus check box on the General page of the Developer Preferences dialog box, you'll see extra commands on some menus in the Form Design Window. These are commands that otherwise appear only in the Integrated Development Environment (IDE). Having them available in the Form Design Window can be convenient for ObjectPAL developers.
-

Organizing your database projects

Because databases can be very large and contain many different objects such as tables, forms, reports, and queries, Paradox offers several features to help you organize your database projects. The Project Viewer is a graphical interface that lets you view all the objects of one or more type contained in a given directory by clicking on the type name(s). Contained within the Project Viewer are the directories, both working and private, that store your work. Finally, aliases allow you to take a full directory path name and rename it with a word or two. Aliases allow for easier access to your databases — no more typing long path names!

Project Viewer

The Project Viewer is a central feature of the Paradox desktop. It provides a quick way for you to organize your database projects.

In the top left corner of the project viewer is a drop-down box that lists directories. You can use your own directory that will contain the tables, form, reports, charts, etc., you create (the default directory for this is called the Working directory). Use the drop-down box to find the directory you want. Simply click on any of the objects listed on the left side of the Project Viewer. For example, if you specify Samples as your working directory and click Tables, you will see a list of all the tables that have been constructed in the Samples project.

From the Project Viewer, you can right-click file names to view associated menus, or double-click to perform the default action, which is usually Open.

Using the Project Viewer for quick access to projects

- Use the drop down box in the top left corner to select an alias, and click the Set Current Directory as Working Directory button to change your working directory.
- Click an icon on the left panel to choose the type of object you want to see.
- Right-click an icon in the left panel to access the New and Open commands. (You can use SHIFT + click and CTRL + click to select multiple icons.)
- Right-click an object in the right panel to display a submenu of commands.
- Double-click an object to execute the first command on the right-click menu (usually Open.) You can also perform the first command on the menu by dragging the selected object(s) onto the Paradox desktop.
- Specify an object type that doesn't have an icon by clicking the Custom icon and entering a file specification, such as *.TXT, in the text box.

- Drag objects from the right panel of the Project Viewer into the Windows Explorer and applications that support OLE 2.0 to copy or embed them there.
- Specify additional objects or files you want to see listed (files that are not in your working or private directories) by creating shortcuts to them. These are called references.

Using the Project Viewer

The Project Viewer lists objects in your working and private directories. It gives you easy access to these objects.

To open the Project Viewer

- Click Tools, Project Viewer.

To have the Project Viewer open each time you run Paradox

- 1 Click Tools, Settings, Preferences.
- 2 Click the General tab if it is not already at the front.
- 3 Enable the Open Project Viewer On Startup check box.

To display a menu of commands for Project Viewer items

- Right-click an object name on the right panel of the Project Viewer.



- If you are viewing all files, you will see that some files do not have menus. This is because some files are automatically created with a Paradox object, and are modified only when you modify the object. (For example, .PX files, .TV files, and .MB files are associated with Paradox tables.)
 - You can change your working directory from the Project Viewer. For information about working and private directories, see “Directories” on page 45.
-

Adding and removing Project Viewer items

You can specify additional objects or files that you want to see listed in the Project Viewer (files that are not in your working or private directories) by creating shortcuts to them. These are called references.

When you open the Project Viewer for the first time, it displays the contents of the working directory. You can add items to the Project Viewer by creating shortcuts. Creating a shortcut (reference) to an item does not move it into

the working directory. Instead, Paradox creates a reference to the item. After the reference is added, you'll see the item (including its path or alias) in the Project Viewer. You can right-click references just as you can items from the working directory.

References show up in dialog boxes, too. For example, if you click File, Open, Table, any references you added appear in the list of files in the Open Table dialog box.

References you add to the Project Viewer apply only to the working directory, so you can have different references for each directory you use.

To add a reference to the Project Viewer

- 1 In the Project Viewer, right-click the object you want to reference and click Create Shortcut.
- 2 Right-click the shortcut and click Cut.
- 3 In the Project Viewer, display the folder where you want to add the reference.
- 4 Right-click the right panel of the Project Viewer and click Paste.

To remove a reference from the Project Viewer

- In the right panel of the Project Viewer, right-click the object you want to remove and click the Delete button.

Removing a reference from the Project Viewer does not delete an object, only the reference to that object.



- You can follow these steps to add non-Paradox items to the Project Viewer. If the item's file extension is associated with a program, you can double-click the non-Paradox object to open it. Refer to your Windows documentation for information on associating file extensions with programs.
 - The Application Framework does not support references.
-

Directories

In order to better organize your database projects, Paradox offers two types of directories:

Working directory

The working directory is like a filing cabinet in which you store everything related to your current project — tables, forms, reports, queries, and so on. A Paradox working directory is the directory Paradox uses by default to open and save files. The working directory controls which files are displayed in dialog boxes during open and save operations. When you install Paradox on a local drive (not a network drive) the default directory is called WORKING and given the alias :WORK:(an alias is simply a short form of the full directory path name). For more information, see “Aliases” on page 46.). This is your default working directory.

You'll probably find it convenient to use working directories to organize your files. Then, when you want to use the files in a specific directory, you can make it your working directory. For example, if you are working with tables, forms, reports, and queries in a directory named C:\DATAFILES\BUDGET, you could change your working directory to C:\DATAFILES\BUDGET.

Private directory

The private directory is a place where you can store temporary files that you don't want other users to overwrite. Especially in a multi-user environment, you need a place to put your temporary objects. You also need a place to store temporary tables in a nonshared directory, such as an Answer or Keyviol table. Otherwise, other users could overwrite them. All Paradox users need their own private directory when they run Paradox.

Your default private directory is PRIVATE, created below the main Paradox directory on your hard drive or on your network home directory if you have no hard drive.

Changing your working directory

Your Paradox working directory is the default data directory Paradox uses to open and save files.

To change your working directory

- 1 Click File, Working Directory.
- 2 Type the full path of the directory you want in the Directory file box. You can also choose an alias from the Alias drop down box.



- Paradox assigns your working directory the temporary alias WORK (even if it already has another alias name).
 - If you create a project alias, Paradox creates a file called PDOXWORK.CFG and stores it in your working directory. This file contains all project aliases (public aliases are stored in IDAPI32.CFG). For more information, see “Aliases” on page 46.
-



- You can also change your working directory from the Project Viewer. Use the drop-down list located in the upper left corner of the Project Viewer to select a directory, then click the Set Current Directory as Working Directory button.
-

Specifying a private directory

If you do not specify a private directory, Paradox uses the PRIVATE directory which is installed below your system directory when you install Paradox on a local (non-network) drive. If you have no local hard disk, the network home directory on the file server should be used as the private directory.

To specify your private directory

- 1 Click Tools, Settings, Preferences.
- 2 Click the Database tab.
- 3 Type the full path and name of a directory in the Private Directory box.

Paradox assigns the :PRIV: alias to your private directory.



- When you change private directories, Paradox releases any locks you have placed on any tables and deletes all your temporary tables. Make sure you do not need any of your temporary tables before you change private directories.
-

Aliases

An alias is a name you can assign as a shortcut to a directory. By default, your working directory has the alias :WORK: and your private directory has the alias :PRIV:.

There are two kinds of aliases:

Public aliases

You can create aliases that are available from all directories. These are called public aliases. Public aliases are stored in the BDE configuration file. They are available from any working directory and visible to any application that uses BDE (the Borland Database Engine).

Project aliases

Project aliases are stored in the PDOXWORK.CFG file in the working directory. They are available only when you are using Paradox and are in the working directory you created them in.

Whenever you change working directories, Paradox unloads all project aliases associated with the old working directory and loads those project aliases that are specific to the new working directory.

Advantages of aliases

- You avoid typing long path names.
- File references within forms, reports, and similar Paradox objects can use alias names rather than full paths. This makes your applications portable. You can move the entire application without recoding all references (just change the alias definition). Used this way, an alias is a variable for a directory path.
- Using the alias, you can connect to or disconnect from your remote database server.
- You can change the definition of an alias at any time. All forms, reports, or other Paradox objects that refer to the alias automatically refer to the new definition of the alias. For example, you can design a complex multi-table form using files on your computer's hard disk, referencing tables with an alias to a directory on your disk. When you are ready to share the form on a network, you move the tables on which the form is based to a network directory and redefine the alias to point to that directory. The form then knows where to find the tables on the network.



- When you change any of these directory or alias settings, Paradox automatically saves the changes.
 - If a project alias has the same name as a public alias, Paradox does not load the project alias.
-

Creating, modifying, and removing aliases

Use the Alias Manager dialog box to create new aliases. You cannot create an alias using extended characters such as characters that contain accents. Paradox also converts lowercase letters to uppercase.

To create a new alias

- 1 Click Tools, Alias Manager.
- 2 Click New.
- 3 Type the name for the new alias in the Database alias box.
- 4 Choose the driver you want from the Driver Type list box.

The Driver Type list box displays all the drivers to which you are connected. Choose Standard to create a database of Paradox (and dBASE) tables.
- 5 Type the full path of the directory location including the drive letter in the Path box.
- 6 Enable the Public Alias check box if you want the alias to be available no matter which directory you are working in.
- 7 Click the Keep New button if you want to keep the alias but do not want to close the dialog box.

The Keep New button becomes the New button. You can then create another alias. If you want the alias you just created to be temporary (exist only until you exit Paradox), click OK.

- 8 Click OK and choose a name for the new alias.

Paradox prompts you to overwrite the existing configuration settings. When you overwrite, Paradox appends the new alias without changing any existing configuration settings. By default, Paradox stores saved public aliases in IDAPI.CFG and project aliases in PDOXWORK.CFG.

To modify an alias

- 1 Click Tools, Alias Manager.
- 2 In the Alias Manager dialog box, choose the alias whose path you want to change from the Database Alias list.
- 3 Type the new path in the Path box.
- 4 Click Save As.

Paradox opens the Save File As dialog box and prompts you to overwrite the existing configuration settings. When you overwrite, Paradox appends

the new alias without changing any existing configuration settings. By default, Paradox stores saved public aliases in IDAPI.CFG and project aliases in PDOXWORK.CFG.

To remove an existing alias

- 1 Click Tools, Alias Manager.
- 2 In the Alias Manager dialog box, choose the alias you want to remove from the Database Alias list box.
- 3 Click Remove.
- 4 When you click OK, Paradox prompts you to save the change in the appropriate .CFG file.



- You can create aliases for local or network directories or for remote databases using the Alias Manager dialog box. To access the Alias Manager dialog box, Click Tools, Alias Manager.
- You can remove the alias from the .CFG file at any time (using the Alias Manager dialog box).



- To create an alias similar to one you already have, select the appropriate alias from the Database Alias list box. Click New, type changes in the box, and click Keep New to save the alias.

Printing, saving, closing and exiting

You can print any tables, forms, reports, or scripts you create in Paradox files.

While working with Paradox, you can save the tables, forms, reports, queries, and other objects. Paradox saves files differently depending on the file type. For example, you must manually save form and report designs, but Paradox automatically saves data as you enter it. Paradox will prompt you to save a modified file upon closing it or exiting the application.

To print a table, form, report, or script

- Click File, Print.

To save your work

- Click File, Save.

To save a form or report design

- 1 With a form or report open in the Design window, click File, Save.
- 2 Type a name for the form or report in the File Name box.

For information on saving specific objects and properties, refer to those items.

To close a window

- Click File, Close.

To close all windows

- Click Window, Close All.

To exit Paradox

- Do one of the following:
 - Click File, Exit.
 - Press ALT + F4.



TABLES

3

Tables are the most fundamental Paradox object. They contain all the information that you want to manage in your database. After you create tables, you can add forms, reports, and queries to manage and manipulate your data.

Creating tables involves storing a variety of information including names, addresses, telephone numbers, and much more. The only condition is that the information has to be organized in a basic table structure. This structure consists of a series of columns, which represent the table fields, and rows, which represent the individual records. Think of a field as a column heading, such as Name, Address, State/Province, or Employee ID. Once you have created a table with all the appropriate fields and defined the field types, you can start creating records by adding data to rows.

Some elements such as field names, types, and sizes are common in creating all types of tables. However, to ensure data integrity and establish the sharing and verification of data between tables, some fields need special properties assigned to them. Maintaining data integrity is essential to a good database. You can use the following Paradox features to help ensure the proper functioning of your database: validity checks, table lookups, passwords, and referential integrity.

Paradox also provides a unique tool for creating, restructuring, and linking tables, called the Visual Database Designer. The Visual Database Designer is an ideal tool to create a visual representation of your database.

Once you have created the table structure, or borrowed the structure from an existing table, you can use a variety of Paradox features to work with the tables. You can

- navigate through the tables and manipulate the view of the data.
- use Filters to display only those records that meet certain conditions you specify or records based on any secondary index, or sort tables based on sorting conditions.
- restructure tables to change the structure of an existing table. You can change the field names, field types, field order, key, indexes, validity checks, referential integrity, password protection, table language, and table lookups.
- change the default view of the table.
- change the data format from the predefined formats. You can define custom formats for number, money, date, time, timestamp, and logical fields.
- manipulate tables by adding, moving, subtracting, and emptying table records and copying, renaming, emptying, and deleting tables.
- set locks which prevent two users from editing the same record at the same time or custom set user lock levels for users.

Creating tables

Planning is the first step in creating a table. You need to decide what type of data you want the table to contain and how you want to lay it out. When you plan a table, keep the following guidelines in mind:

- Put as little information as possible in each field. This allows for more flexible data maintenance and straightforward querying. For example, if you break an address into separate fields for street, city, and state, you can easily query on these specific field values. This is where designing a database table differs from designing a spreadsheet. If you ever want to see the data in a spreadsheet-like format, you can create a crosstab of the table's data.
- Be complete. Include fields for all the information you think you'll need, but don't clutter the table with information you don't need.
- Use small tables. If you have a great deal of information to organize, it's generally better to put it in several small, related tables rather than in one all-encompassing table. For more information, see "Understanding data normalization" on page 27.

- Keep the tables familiar. It's often best to create tables that correspond to the kinds of objects, like forms and files, you already use.
- Avoid redundancy. Beyond the common fields (primary and foreign keys) necessary for linking tables, don't duplicate information in different tables.

Creating a Paradox table

The first step in creating a Paradox table is planning its structure. You have to determine which fields you need in the table, what type of field each should be, and what you are going to name them. You can either create one from scratch or use the Table Expert. Whichever method you choose, you will need to understand the following basic concepts: field names, field types and sizes, and keys.

Field names

A field is a column of information in a table. A collection of related fields makes up one record. When you are ready to create the table, you must first define the fields. Field definition involves not only choosing a name for the field, but also specifying a field type and size. You must also decide whether the field will be a key field for the table.

For more information about the rules for naming fields, see Paradox field names and types in the Reference section of the Online Help.

Field types and sizes

Once you have decided what to name the field, you should have a good idea of what kind of information will be entered into it. For example, a phone number field may consist of numbers, brackets, and dashes, and therefore an alpha field would be the best field type. You only need to specify a field size if the field type you choose requires a size limitation. For example, a memo field could be quite long and its length may be unpredictable. Limiting the size of such alpha fields is a good way to maintain data integrity.

When creating a field, you must specify not only the name of the field, but the field type and size. You must also decide which field(s) will form the primary or composite key for the table.

For a detailed description of each field type, see Paradox field types in the Reference section of the Online Help.

Keys

Paradox uses key fields to link tables and to sort records. Keys can be either primary or composite.

- **Primary Keys:** When you designate a primary key field, it must be the first field in the table and it must be unique. This means that it must consist of data that could not possibly be duplicated. For example, it is not a good idea to use Last Name as a key field in an employee table because you might have more than one employee with the same last name. Employee No. (a number particular to each individual employee) is a better key field. Using a unique field for the key ensures that tables can be linked without error. If you specify Employee No. as the primary key in one table, you can only relate that table to another that also has Employee No. as a field. In the first table, Employee No. is the primary key; in the second table, Employee No. is the foreign key. If you create a key on the Last Name field of the sample CONTACTS.DB table, you are telling Paradox to organize the table by the values in the Last Name field, as shown in the following figure.

	Last Name	First Name	Company	Phone
1	Akers	Marsha	Tote Tote Tote	809-555-2004
2	Akers	George	Larry's Diving School	503-555-1875
3	Androski	Lorraine	Marina SCUBA Center	602-555-6426
4	Bateslee	Candy	Safari Under the Sea	809-555-0366
5	Berman	Raymond	Fisherman's Eye	809-555-0804
6	Berman	Doag	Atlantic SCUBA Center	207-555-1866
7	Doling	Tina	Blue Glass Happiness	213-555-1904

- **Composite Keys:** When you create a composite key, Paradox creates a primary composite index which organizes the records by the first field of the key (according to the table's structure) and then the next field, and so on. The following figure shows the CONTACTS.DB table with a composite key made up of the Last Name and First Name fields. Records 31 and 32 illustrate the composite key by sorting the records alphabetically by first name.

	Last Name	First Name	Company	Phone
31	Lands	Robert	Frank's Divers Supplies	503-555-2770
30	Lohmeyer	Bob	Shanghai Sports Center	809-555-1982
31	Lambard	Glouce	SCUBA Heaves	809-555-7307
32	Lambard	Pat	Neptuna's Trident Supply	404-555-6770
33	Lee	Carl	Captain's Dive Club	213-555-2642
34	Lutz	Nancy	The Depth Charge	809-555-6393
35	Malikowicz	Denise	Underwater Sports Co.	408-555-1874

Creating and saving a table

Once you have decided on the type of data you want to enter into a table, you must create a table structure. Think of table structures as the blueprints for your tables. You can also borrow the structure from an existing table and modify it according to how you want to define the table.

In addition to borrowing the structure of a table, you can also borrow its primary (key) or secondary indexes, validity check definitions, referential integrity, and table lookup definitions. Use the Options settings in the Select Borrow Table dialog box to specify the definitions you want to borrow with the table.

Once you've completed the structure for the table, you should save it.

To create a Paradox table from scratch

- 1 Click File, New, Table.
- 2 Click Blank.
- 3 Select a table type from the Table Type list box and click OK.
- 4 Type the name of the field in the Field Name column.
- 5 Click the Type column and select the appropriate field type from the list box.
- 6 In the Size column, accept the default size or type an appropriate field size.
- 7 To set the field as a key field, click in the Key column to the left of the field name.

A key icon appears indicating that the field is now a key field.
- 8 Click in the next row to create another field. Repeat steps 5 to 8 until you have specified as many fields as necessary.

To borrow a table structure

- 1 Follow steps 1-3 from the previous procedure.
- 2 On the Field Roster page, click Borrow.
- 3 From the Look In box, find the location of the table whose structure you want to borrow, or type the table name in the File Name box.
- 4 In the Options section, enable the check box beside any table properties you want to borrow.
- 5 Click Open.

Paradox copies the structure of the table to the Table Structure dialog box.

To save the table

- 1 Click Create.
- 2 Type the name of the table in the File Name box.

- 3 Select Paradox (*.DB) in the Save As Type box.
- 4 Click Save.



- If you want to change a table once you've created it, you can restructure it. Click Restructure to access the Restructure Dialog box.
- If a field in a table is hyperlinked, you can deactivate and activate it by clicking Tools, Settings Preferences. On the General page of the Preferences dialog box, enable or disable the check box as appropriate. This is useful when you are in edit mode and you don't want to launch the Internet application.
- For more information about the other columns, such as Min, Max, Default, Picture and Req'd, see "Validity checks" on page 63.

Defining key fields

When you define a key field, Paradox makes it the primary index and sorts records on it. If you choose to define a composite key, you must include enough fields to ensure the uniqueness of each table record. If you cannot reasonably expect a composite key to handle all cases of duplicate data, it is a good idea to define an identification field that identifies one and only one record of the table.

Observe the following rules when defining key fields:

- A table can have only one key. This key can be made up of one or more fields. If a key consists of more than one field, it is a composite key.
- You cannot assign a key to memo, formatted memo, graphic, OLE, binary, logical, or bytes fields.
- If a key is defined as a single field, that field must be the first field in the table.
- If you identify more than one field as a key field, you create a composite key. These fields, taken as a group, must be unique for each record of the table. The composite key must begin on the first field in the table and must include sequential fields.
- Each value in the field must be unique. This ensures you do not have duplicate records in the table.

- You can leave only one record in the key field blank because Paradox considers subsequent blank fields to be duplicates and does not accept records containing them.
- The key establishes the default sort order for the table. Paradox sorts the table's records based on the values in the field(s) you define as the table's key.

To create a primary key field

- 1 Open the table for which you want to define the key field.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page of the Restructure dialog box, click the key column to the left of the first field to define the key.

To create a composite key

- 1 Open the table for which you want to define the composite key.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page of the Restructure dialog box, click the key column to the left of the fields for which you want to define the composite keys.

Handling Key Violations

If you add a primary key to a table that was previously unkeyed or had different keys, you might cause key violations. You might also rearrange fields so that the key fields are no longer the first consecutive fields in the table. This means data already entered into the table violates the rules established by the key. Paradox deletes key-violating records from the table to a temporary table called KEYVIOL.DB located in the PRIVATE directory.

Also, removing one or more fields from a composite key may cause duplicate values in the remaining key field(s). If this happens, Paradox places duplicate records in a temporary table called KEYVIOL.DB. If there is already a KEYVIOL.DB table, Paradox adds a number to the new temporary table, so it might appear as KEYVIOL1.DB or KEYVIOL2.DB. Paradox can create up to 100 temporary tables of the same name (the first is not numbered and the last is number 99).

To locate the KEYVIOL.DB table

- 1 Click File, Open, Table.
- 2 Use the Up One Level button to locate the PRIVATE directory.
- 3 Double-click the KEYVIOL.DB table to open it.



- You can change the records in KEYVIOL.DB so they comply with the key requirements, and then add them back to the original table using the Add command from the Tools, Utilities menu.
- If you remove a key located above the other keys, Paradox displays an error message when you try to save. To correct the error, ensure that all key fields are the first fields in the table.

Indexes

An index is a file that determines the order in which Paradox accesses the records in a table. Although the file is never visible, Paradox uses it to link tables and access records. Primary indexes are defined while creating the structure of a table. Although they are optional, they are great time-savers. Secondary Indexes help to speed queries and display data with a different sort order.

Primary Index

When you add a key to a table, you are creating a primary index. Paradox organizes the records of a keyed table according to the values in the key field(s). By default, all indexes organize and access data in ascending order (A to Z, or 0 to 9). To prevent data duplication, the key also ensures that no two fields have the same information. A primary key must be the first field in a table.

Secondary Index

A secondary index is a field or group of fields that you define as

- one or more sort orders for the table
- a field you can link the table on
- a way to speed up certain search and locate operations

A table can have more than one secondary index. In fact, you can identify each field of the table as a secondary index, so you can sort the table on any of its fields. You can also create composite secondary indexes by combining two or more fields. When you use a secondary index, you change only the

view order of the records. The physical location of the records in the table does not change (the primary index or key determines the physical sort order for the table).

When you create a secondary index, you can also specify three index options: Unique, Maintained, and Case sensitive.

You cannot create a secondary index on a memo, formatted memo, binary, OLE, graphic, logical, or bytes field.

Composite Secondary Index

A composite secondary index is composed of a group of fields rather than a single field. Paradox creates a composite index and sorts the records in the table based on the first field in the key and then on subsequent fields in the order in which they appear in the table.

Alternate sort orders

You must use a secondary index to re-sort a keyed table. Only an explicitly defined secondary index can override the primary sort order established by a table's key definition. For example, if you want to view a CUSTOMER.DB table by First Name values, but need to keep the table's key intact, you can define a secondary index on First Name and use it to temporarily change the view order of the records.

Linking tables

Secondary indexes are also used in linking Paradox tables. For example, you can link the sample CUSTOMER.DB and ORDERS.DB tables and then create a form that displays the orders that each customer has placed. The ORDERS table has a secondary index identified on its Customer No. field. This means Paradox can quickly find all the records with a given Customer No. value. When you link the tables, Paradox identifies each Customer No. value in CUSTOMER.DB, then finds and displays all matching Customer No. values in ORDERS.DB.

SQL Tables

SQL (Structured Query Language) tables use unique and non-unique indexes, but they do not use the primary keys that Paradox tables use. You can create multiple indexes for an SQL table. For each index, you specify whether it is unique or non-unique. SQL indexes are always maintained, unlike Paradox and dBASE indexes. You can use Paradox to create and modify indexes on SQL tables, but you cannot specify which index to use in Paradox. When you use an SQL table in Paradox, the table should have a unique index. If it does not have a unique index and you edit the table's data, you may not be able to view the edits as you are making them.



- dBASE uses an index to organize the records in a table according to the values in one or more fields.
- For more information about keys, see “Creating a Paradox table” on page 53.
- For more information about changing the sort order of a table, see “Sorting tables” on page 100.

Creating secondary indexes

You can define a secondary index on any field or group of fields in a table except BLOB fields. Composite secondary indexes can have up to 16 fields.

To define a field or group of fields as a secondary index

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 Click the Secondary Index tab.

Paradox displays any existing secondary indexes and the fields you can use as a secondary index. BLOB fields are dimmed.
- 4 Click Add and type a name to define a new Secondary Index.
- 5 In the Fields box, select the field on which you want to define the secondary index.
- 6 Click the *right arrow* to move the field into the Selected Index Fields box.
- 7 Specify either ascending or descending sort order by clicking the default sort order.
- 8 Enable any of the following check boxes:
 - Case-sensitive — use capitalization, or case, as a criterion for sorting (uppercase letters sort before lowercase letters).
 - Maintained — Paradox automatically updates the index whenever you update the table. A table must have a key before you can create a maintained secondary index.



- Unique — (you must first enable Maintained before you can enable Unique) determines whether records can have duplicate values in the secondary index field or fields. If two or more records have the same value in the secondary index field, the attempt to define the secondary index fails. You have to eliminate duplicate values before defining the secondary index.
- 9 To define a composite secondary index, repeat step 4 to add additional fields to the secondary index.



- A Paradox Native Index is non-composite, non-unique, case-sensitive, and ascending.
- When you create a secondary index based on a single field, Paradox uses the field name to identify the secondary index. Therefore, you cannot name a composite secondary index the same name as any of the fields in the table. If you change the options of the secondary index (so it is not a Paradox Native Index), you can define a custom name.



- A non-maintained index is not automatically updated when you update the table, but you can open a non-maintained index for use on a table if the index is synchronized with the table. (Click Format, Filter once you open the appropriate table to specify the index you want to use while working with the table.) When you view a table with a non-maintained index, the table is temporarily locked and cannot be updated. The table is also locked if you use the ObjectPAL methods `setIndex()` or `switchIndex()`.

Modifying and removing secondary indexes

If you are currently sorting on a secondary index and wish to change the sort order to a different field, you must change the secondary index. You may need to change the secondary index to establish new table links and speed up the search and replace operations. You can also remove a secondary index if you no longer need it.

To modify a secondary index

- 1 Open the table with the secondary index you want to modify.
- 2 Click Format, Restructure Table.
- 3 Click the Secondary Index tab.
- 4 Select the index you want to modify from the Index Names list box.

5 Modify the Secondary Index by doing any of the following:

- Change the Sort order by clicking the sort column and choosing the preferred option from the list box.
- Add and delete fields (creating or removing a composite secondary index) by using the *right and left arrows*.
- Change the Index Options by enabling and disabling the check boxes.



6 Click Save.

To remove a secondary index

- 1 Follow steps 1 to 4 from the previous procedure.
- 2 Click the Remove button.
- 3 Click Save.

Maintaining data integrity

Maintaining data integrity is essential to a good database. Paradox offers the following features to help ensure the proper functioning of your database:

Validity checks

Validity checks are rules imposed on a field to ensure that the data entered in the field meets certain requirements. A Picture validity check is a pattern of characters that defines what you can type into a field during editing or data entry.

Table Lookups

A table lookup assures that a value entered in one table matches an existing value in another table. You can also specify whether the person entering data in the field is allowed to view the lookup table and copy values from it, or will be required to match the lookup table's values without being able to see them.

Passwords

You can ensure that the table you create is protected from access by unauthorized users. You can specify master passwords, which control all access to an entire table, or auxiliary passwords, which use table rights and field rights to provide different levels of access privileges.

Referential integrity

Referential integrity is a means of data verification. It prevents the data shared by separate tables from being broken. If you establish referential integrity between a CUSTOMER.DB table and an ORDERS.DB table on the common Customer No. field, then only orders with a verifiable customer number (verified automatically by Paradox in the CUSTOMER.DB table) can be entered in the ORDERS.DB table.

Validity checks

The way you define a validity check determines what can be entered in a field. For example, if the majority of your customers live in California, you could define a validity check on the State/Prov. field in your Customer information table so that every time you entered a new customer, Paradox would automatically enter CA in the field, which ensures that you have the valid State/Prov. entered. If a customer does not live in California, you can edit the field.

If you create a picture validity check for a table that contains data, Paradox does not reformat existing data to match the picture, nor does Paradox validate existing data to check that it matches. However, if you choose to add or change a validity check, you have the option of enforcing the new validity check on existing data using the Restructure Warning dialog box. If you choose to enforce the new validity check on existing data and any data that does not comply with it, Paradox places the non-compliant data in the KEYVIOL.DB table. Paradox does not do this if the validity check is a picture. You can change the records in KEYVIOL.DB and then add them back to the table using Tools, Utilities, Add.

Paradox provides five kinds of validity checks:

Validity check	Meaning
Minimum	The values entered in this field must be equal to or greater than the minimum you specify here.
Maximum	The values entered in this field must be less than or equal to the maximum you specify here.
Default	The value you specify here will be entered in this field automatically if no other value is entered.
Picture	The character string that you specify here acts as a template for the values that can be entered in this field.
Required field	Every record in the table must have a value in this field.

When you save a table, Paradox saves validity checks in a file with the table's name and the .VAL file extension.

Picture Validity Checks

A picture validity check acts as a template that formats the value you enter in a field. For example, if you specify the picture `(###)###-####` (a common template for U.S. phone numbers) and enter the value 4085551234, Paradox formats the value into (408)555-1234. You can use these characters in a picture validity check string:

Character	Stands for
#	Numeric digit
?	Any letter (uppercase or lowercase)
&	Any letter (convert to uppercase)
~	Any letter (convert to lowercase)
!	Any character (convert to uppercase)
;	(semicolon) Interpret the next character as a literal, not as a special picture-string character.
*	Any number of repeats of the following character
[abc]	An optional part of the string that can be left out; type nothing or type 'abc'
{a,b,c}	Optional characters a, b, or c

*n where n is a number means 'Repeat the next symbol exactly n times' so *3#-*4# tells Paradox you want to enter three numbers, a dash, and then four numbers, which is the picture of a standard North American telephone number. You can also use a semi-colon to over-ride this syntax ex '*;3' means any number of threes.



- You can also specify pictures on field objects in design documents. However, if you create a picture validity check for the field in the table (as described in this topic), you cannot specify one for a field object bound to that field.
- If you add a new field that has a default validity check on it, and choose to enforce the validity check on existing data, Paradox creates the new field and places the default value in each record of the table. If you define a default validity check on an existing field that contains data, Paradox does not overwrite the existing data with the new default value.

Following are some examples of picture validity checks:

Picture	Description
#####	Canadian postal code; for example, K1S 2A2
*!	Any entry; all letters will be in uppercase
{Yes,No}	Either “Yes” or “No”

Creating a required field validity check

When you define a required field validity check on a field, the field must contain data before Paradox accepts the record. If you try to enter a record in a table that doesn’t have a value in a required field, Paradox informs you that the validity check has failed, and does not let you move from the record until you enter a value in the required field.

You can place a required field validity check on any field type and you can define required fields for Paradox and SQL tables.

To create a required field validity check

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page, select the field to which you want to apply the validity check.
- 4 Enable the Req’d check box.



- To remove a required field validity check, click the field and disable the Req’d check box.

Creating minimum and maximum value validity checks

Minimum and maximum value validity checks allow you to define the minimum and maximum acceptable values for a field. For example, if all of your customer identification numbers are at least five digits long, you might want to define a minimum value of 10 000 on that field, thereby helping to prevent data entry errors.

You can use minimum value and maximum value validity checks for alpha, number, short, long integer, money, timestamp, time, and date field types. You cannot use a maximum validity check on an autoincrement field.

To define a minimum or maximum value validity check

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page, click the field for which you want to define the minimum or maximum validity check.
- 4 Do one or both of the following:

- Click the Minimum column and type a minimum value.

The values the user enters in the field must be greater than or equal to the minimum you specify.

- Click the Maximum column and type a maximum value.

The values the user enters in the field must be less than or equal to the maximum you specify.



- When you define a numeric minimum or maximum, you must use the number format currently selected in the Windows Control Panel. During data entry, however, you can use any format.
- You cannot use minimum-value and maximum-value validity checks on BC dates; instead, you can define a picture validity check on BC dates.
- If the field is gray, you cannot define a validity check.



- You can specify an initial value for an autoincrement field using a minimum validity check by entering the initial field value in the Minimum box when you first create a table.

Creating and removing a default value validity check

Default value validity checks automatically enter a value in each record of the table as soon as you create the record. For example, if most of your customers are located in the United States, you could define USA as the default value for the Country field in your customer information table. Whenever you insert a new record, it would appear with the value USA already in the Country field.

You can use default value validity checks for alpha, number, short, long integer, money, logical, and date field types (including date, time, and timestamp.) When you enter numeric values as a default, you must use the number format currently selected in the Windows Control Panel.

To create a default value validity check

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page, click the field for which you want to define a default value.
- 4 Type a default value in the Default Value box.



- If the column is gray, you cannot define a validity check.



- You can use the TODAY operator to define today's date as the default value in a date field. NOW can be used as a default for time and timestamp fields.

Creating picture string validity checks

Paradox provides a selection of standard picture strings for data such as phone numbers, zip and postal codes, and words that must be capitalized.

If you use any printable (visible) character in a picture string different from those listed in the table, Paradox treats it as a constant. When you enter a value in a field that has a picture validity check and you come to a point at which a constant is specified, Paradox automatically enters the constant. For example, if you create the picture (408)###-#### and then type 5551234 in the field, Paradox inserts (408)555-1234 in the table.

If you don't want to use any of the sample picture validity checks, you can create a custom picture validity check either by editing one of the samples or coding one of your own. Paradox allows you to save custom picture validity checks for future use.

To specify a standard picture string validity check

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page, click the field name for which you want to define a picture validity check.
- 4 Click the Picture field and select a sample from the list box.

To create a custom picture string validity check

- 1 Follow steps 1-3 from the previous procedure.
- 2 Click the Picture field and select Picture Assistant from the list box.
- 3 From the Type list box, select the default field type or select Anytype, which allows you to create a picture that can be used with any field type.
- 4 Click the Add button.
- 5 Type a new name for the picture in the Pictures box.
- 6 Type the syntax for the new picture in the Picture Code box.
The indicator button to the right of the Picture Code box will inform you if your code is correct or incorrect.
- 7 Type a sample value for the code in the Sample Value box.
- 8 Click the Test button to verify your sample.
The indicator button to the right of the Sample Value box will inform you if your code is correct or incorrect.
- 9 Type a description for the new picture in the Description box.

To edit a custom picture string validity check

- 1 Select the Picture you want to edit in the Pictures box.
If you want to edit the Picture name, double-click the name in the Pictures box.
- 2 Edit the picture code, sample value or description.
- 3 If you want to cancel your changes, click the Revert button to revert back to the initial code.

To delete a picture string validity check

- 1 Select the Picture you want to delete in the Pictures box.
- 2 Click the Delete button.



- The indicator button for the Picture Code is an ‘on-the-fly’ operation. You will not be able to enter a sample value or test the sample value until the Picture Code indicator button indicates your code is correct.
 - If you want to restore the default picture string validity checks, click the Restore Default Pictures button. Note that this action will restore the default pictures, but will delete any of the custom pictures that you added.
-



- For a list of picture codes, click the Code Syntax button.
-

Removing validity checks

If you decide that a field for which you required a validity should no longer be restricted by this check, you can delete the validity check.

To remove a validity check

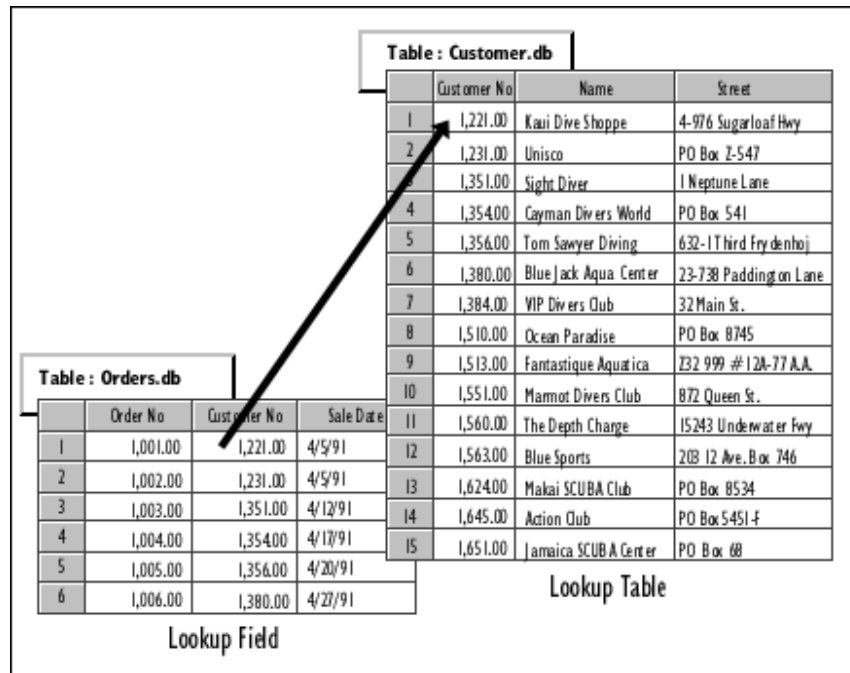
- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 On the Field Roster page, click any of the following:
 - the minimum field defined as a validity check and press delete.
 - the maximum field defined as a validity check and press delete.
 - the default field defined as a validity check and press delete.
 - the picture field defined as a validity check and select none from the list box.
 - the Req'd field and uncheck the box to disable the validity check.

Table lookups

Table lookups let you speed up and verify data entry. When you specify a lookup table for a field, you are saying that the field can contain only values that exist in the first field of the other table (the lookup table). You can also specify whether the person entering data in the field can view the lookup table and copy values from it, or whether they are required to match the lookup table's values without seeing them.

The following diagram exemplifies a table lookup:

The Lookup Field looks to the Lookup Table for information.



The difference between table lookup and referential integrity

A table lookup helps you enter data that already exists in another table. To establish a more powerful tie between two tables, define a referential integrity relationship. While a table lookup ensures that data is copied or added accurately from one table to another, referential integrity ensures that the ties between like data in separate tables cannot be broken.

Rules for table lookups

Follow these rules when setting up a lookup table:

- The field of valid entries must be the first field in the lookup table.
- The field that you are defining as a table lookup must have the same field type and size as the first field of the lookup table.
- For best performance, the first field should be the primary key for the lookup table.

You can use a table lookup across different directories. When you define a table lookup on a table from a different directory, Paradox stores the full path to the table. If you move the lookup table to a different directory, you must recreate the same path or redefine the table lookup.

Lookup types

Paradox has two Lookup type options for lookup tables:

- **Current Fields**—only the current field gets its value from the lookup table even if the current table and the lookup table have other fields in common.
- **Applicable Fields**—all fields of the current table that correspond to fields in the lookup table take their values from the lookup table. Corresponding fields must have identical field names and compatible field types in both tables. Only the first field of the lookup table is used as part of the validity check.

Lookup rights

Paradox has two viewing access types for lookup tables:

- **Fill Only:** Does not allow the user to view the lookup table when editing a table and informs the user when the value is invalid. This option is useful when you want to keep values in the lookup table secure.
- **Fill And View:** Allows the user to display and select values from the lookup table while editing a table.



- When a Paradox table is version 5 level or lower, it can not create a lookup if the table name or directory path has more than 8 characters. If you want the table lookup to work, you must upgrade the table to level 7 by using the table repair utility or by defining a level 7 feature for the table when restructuring (such as a descending index).
- When you create a database, all the tables should be saved in the same directory, including lookup tables. Although the Data Modeler allows you to move from alias to alias, you should not link tables from two different databases or create a lookup between tables from different databases. The concept of a relational database is one where only tables within the same directory are linked.

Creating and using table lookups

The table lookup feature lets you compare the data entered in one field of a table with the data entered in another table to verify acceptable values for that field. Paradox has two lookup types you can choose when creating table lookups: Current fields and Applicable fields. Paradox also has two lookup rights you can choose when creating table lookups: Fill Only and Fill and View.

To create a table lookup to an existing table

- 1 Open the table to which you want to apply the lookup table.
- 2 Click Format, Restructure Table.
- 3 Click the Table Lookup tab.
- 4 In the Fields list, click the field of the table for which you want a lookup.
- 5 Click the *right arrow*.
- 6 From the Lookup Tables list box, select the table that will be used as the lookup table for the specified field.



You can locate the file using the button next to the Drive list box.

- 7 In the Lookup type box, enable one of the following buttons:
 - Current fields — only the current field gets its value from the lookup table.
 - Applicable fields — all fields that correspond to fields in the lookup table get their value from the lookup table.
- 8 In the Lookup rights box, enable one of the following:
 - Fill Only — lets you enter data without viewing the lookup table.
 - Fill and View — lets you view and select from the lookup table.

Using a Table Lookup

- 1 Click View, Edit Data.
- 2 Click Record, Insert.
- 3 Select the field for which you assigned the lookup.
- 4 Press CTRL + SPACEBAR to open the Lookup Table.
- 5 Select an appropriate value in the Lookup Table and click OK.



- You can also use a table that you create from scratch that holds all acceptable values for the field (this is the lookup table). Remember that the first column in the table must contain the actual acceptable values for the other table's lookup field. After you have created the table with the appropriate values, you can follow the steps above to use it as the table lookup.

Passwords

Security is especially important in a multi-user environment. Not only can you establish a password for the table as a whole, you can assign specific rights to the table or to individual fields. Once you specify password security, only those users who know the password can access the table. Whenever users try to access a password-protected table, Paradox prompts them to supply the password (if they haven't already done so).

Master passwords

Master passwords control all access to an entire table. You must specify a master password before creating additional access restrictions. To maintain security you should change your master password regularly. As well, you can delete master passwords if they are no longer required.

Auxiliary passwords

Auxiliary passwords use table rights and field rights to provide different levels of access privileges for different users in a group. Table rights determine the overall level of access to a table. Field rights determine the level of access to an individual field within the table. Auxiliary passwords can be used to allow users to view data but not delete it.

The type of table rights you specify for a user determines the type of field rights you can specify for that user, as shown in the following table:

Table rights	Possible field rights
All (highest access)	All
Insert & Delete	All
Data Entry	All, Read Only, or None
Update	All, Read Only, or None
Read Only (least access)	All, Read Only, or None



- Auxiliary passwords provide different levels of access privileges for different users in a group.
- Typically, one person — such as a database administrator — has access to master passwords. A group of users who need to perform different tasks with the table have different auxiliary passwords that provide different levels of access.

Creating a master password

A master password protects access to an entire table. Users must input the correct password before Paradox opens the table. If you want more specific security, you can create auxiliary passwords that affect individual fields. You must first define a master password before you can assign any auxiliary passwords.

To create a master password

- 1 Open the table for which you want to create a master password.
- 2 Click Format, Restructure Table.
- 3 Click the Passwords tab.
- 4 Click the Define button.
- 5 Type a password in the Master Password box.
- 6 Type the password again in the Verify Password box.



- A password can be up to 15 characters long including spaces. Passwords are case sensitive.
-

Entering and releasing passwords

Whenever you open a password-protected table, the Enter Password(s) dialog box appears. Paradox prompts you to enter the password before you open the table. If you open a table once, supply the correct password, and then close the table, Paradox allows you to re-open the table without re-entering the password. But, once you exit the program, Paradox releases all passwords. Releasing a password means that the password is reactivated and the user must enter the password before accessing the table. You can also release a password without exiting Paradox.

If you assigned the same password to several tables, Paradox allows you to enter the password to all applicable tables at the same time. For more information, see “Creating a Master Password” on page 74.

To enter the common password for several tables

- 1 Click Tools, Security, Passwords.
- 2 Type the password in the Password box.

- 3 Click the Add button.

Paradox applies the password to all tables assigned that password, so that you don't have to type in the password the first time you open up the table(s) for that session.

To release a password without exiting Paradox

- 1 Click Tools, Security, Passwords.
- 2 Type the password you want to release from memory.
- 3 Click the Remove button.

Next time you try to open the table with the above password, you will be prompted to enter the password.



- Click the Remove All button to release all passwords. Tables that are currently open are not affected.
-

Changing and deleting a master password

To make sure the tables retain the level of security you require, you should change your master password regularly. As well, if a password-protected table contains information that no longer needs to be restricted, Paradox lets you delete the master password.

To change a master password

- 1 Open the table for which you want to change the master password.
- 2 Type the master password to open the table.
- 3 Click Format, Restructure Table.
- 4 Click the Passwords tab.
- 5 Click the Modify button.
- 6 In the Password box, type the new password.

You'll see asterisks (*) representing the characters you type. A password can be up to 15 characters long including spaces. Passwords are case sensitive.

- 7 In the Verify Password box, retype the new password.

If the two passwords aren't identical (including capitalization), you'll see an error message prompting you to enter either one of them again. If the two passwords are identical, Paradox saves the password and closes the Passwords dialog box.

- 8 Click OK.
- 9 Click Save to save your settings and close the Restructure dialog box.

To delete a master password

- 1 Open the table for which you want to delete the master password.
- 2 Type the master password to open the table.
- 3 Click Format, Restructure Table.
- 4 Click the Passwords tab.
- 5 Click the Master Password in the Passwords list.
- 6 Click the Delete button.
- 7 Click Yes.
- 8 Click Save to save your settings and close the Restructure dialog box.

Creating and modifying auxiliary passwords

To create auxiliary passwords, you must first create a master password for the table. Auxiliary passwords apply read and write access to the table as a whole. Once you define the rights for the whole table, you can further limit user access to the table by assigning rights to individual fields. For example, you could give a user Read access to the whole table, but then hide fields in the table that contain sensitive information that you don't want general users to be able to see or edit. Once you've assigned an auxiliary password, you may need to modify or delete the password depending upon your user's needs and changes to the tables.

To create an auxiliary password

- 1 Open the table for which you want to create an auxiliary password.
You will have to enter the master password to open the table.
- 2 Click Format, Restructure Table.
- 3 Click the Passwords tab.
- 4 Click the Add button.
- 5 Type the name for an auxiliary password.
- 6 In the Table Rights section, enable any of the following check boxes:

- All—gives a user rights to any function in the table, including the ability to restructure or delete it and to change or delete passwords.
 - Insert And Delete—gives a user the right to insert, delete, or empty records, but not to delete or restructure the table.
 - Data Entry—gives a user the right to edit data and insert new records, but not to delete or empty records or restructure the table.
 - Update—gives a user the right to view the table and change non-key fields, but not to insert or delete records or change key fields.
 - Read Only—gives a user the right to view the table, but not to change it in any way.
- 7 Assign rights to specific fields in the table by clicking the Access cell to the right of the field name and selecting Full, Read Only or None from the list box.

To modify the auxiliary password

- 1 Open the table for which you want to change the auxiliary password.
- 2 Click Format, Restructure Table.
- 3 Click the Passwords tab.
- 4 Select the auxiliary password you want to modify.
- 5 Follow steps 6-7 from the above procedure.
- 6 Click one of the following:
 - Save—accepts the modifications.
 - Cancel—cancels any changes and restores the original access rights settings.

To delete an auxiliary password

- 1 On the Passwords page of the Restructure dialog box, select the Auxiliary Password you want to delete.
- 2 Click the Remove button.

Referential integrity

Referential integrity is extremely important when creating multiple relationships between tables. Data integrity ensures that the values in a table are valid. Referential integrity requires a field or group of fields in one table (the child table) to refer to the key of another table (the parent table) to determine valid values. When you establish referential integrity, Paradox checks the validity of a value before accepting it in the referential integrity

table. For example, if you establish referential integrity between CUSTOMER.DB and ORDERS.DB on their Customer No. fields, then enter a value in the Customer No. field of the ORDERS.DB table, Paradox searches the Customer No. field of CUSTOMER.DB and either accepts the value in ORDERS.DB if it exists in CUSTOMER.DB or rejects the value in ORDERS.DB if it doesn't exist in CUSTOMER.DB.

Referential integrity and indexes

When you create or modify a referential integrity relationship, Paradox creates a secondary index on the referential integrity fields if it does not already exist. Paradox names the index with the name of the field (if it's a single-field definition) or the name you gave the referential integrity (if it's a multiple-field definition). The index appears in the list of secondary indexes. If you delete the referential integrity, Paradox does not automatically delete this index. You must delete it manually.

Referential integrity guidelines

Follow these guidelines when you establish referential integrity:

- You can establish referential integrity only between like fields that contain matching values.

For example, you can establish referential integrity between the sample CUSTOMER.DB and ORDERS.DB tables on their Customer No. The field names do not matter as long as the field types and sizes are identical.

- You can establish referential integrity only between tables in the same directory.
- You can establish referential integrity between an autoincrement field and a Large Integer field.
- The referential integrity parent table must be keyed.
- If you define referential integrity on a table that already contains data, some existing values may not match a value in the parent's key field. When this happens, Paradox places the existing records that do not match into the temporary KEYVIOL.DB table in your private directory.

Self-referential integrity

A referential integrity relationship between a field in a table and the same table's key field is called a self-referential integrity relationship. For example, suppose you are using a table of employees keyed on the Employee ID field. If this table has a Supervisor field, you may want to create a self-referential integrity relationship between Supervisor and Employee ID, because the supervisors are also employees.

When you create a self-referential integrity relationship, you

- must click Prohibit in the Update rule box of the Referential Integrity dialog box. (This security feature prohibits changes to records in a parent table that also exist in a child table.)
- cannot create a circular reference. That is, you cannot create a relationship in which a field refers to itself.



- You cannot establish referential integrity between dBASE (.DBF) files, Paradox 3.5 tables, or tables that do not have a key. You can use .DB files and also some SQL server tables if you need referential integrity. See your server documentation to determine if your table type supports referential integrity.
 - If you copy the parent table, Paradox doesn't copy the referential integrity. If you copy the child table, Paradox copies the referential integrity, and the copied table must meet the requirements of the referential integrity. Both tables in the referential integrity relationship must be in the same directory. When you copy the child table to a different directory, you break the referential integrity link.
-

Defining and removing referential integrity

Paradox allows you to define or remove referential integrity relationships between a parent table and one or more child tables in the same directory. Only values that exist in the parent table's key (and therefore the first field or fields in the table) are valid values for the specified field(s) of the child table(s). Always set your working directory to the folder containing the tables for which you want to establish referential integrity; Paradox does not let you define the relationship otherwise.

To define a referential integrity relationship

- 1 Open the child table.
- 2 Click Format, Restructure Table.
- 3 Click the Referential Integrity tab.
- 4 Click the Add button and type a name in the Link Names list.
- 5 Select the parent table from the Parent Table list.
- 6 Click the child table's field in the Fields list for which you want to establish the referential integrity relationship, and click the right arrow.

If the parent table has a composite key, add fields to match all of the parent's key fields.

- 7 Click Save to save the Referential Integrity relationship.

To remove a referential integrity relationship

- 1 Open the child table.
- 2 Click Format, Restructure Table.
- 3 Click the Referential Integrity tab.
- 4 In the Link Names list, click the name of the referential integrity relationship you want to remove.
- 5 Click the Remove button.



- You can also specify what attributes of referential integrity you want to apply using the options in the update rule section and the Strict Referential Integrity check box. For more information, see “Defining Update Rule and Strict Referential Integrity” on page 80.

Defining Update Rule and Strict Referential Integrity

If you want to control how Paradox updates records in a referential integrity relationship, you can specify Cascade or Prohibit. You can also ensure access on a table by enabling Strict Referential Integrity.

To modify a referential integrity relationship

- 1 Open the child table.
- 2 Click Format, Restructure Table.
- 3 Click the Referential Integrity tab.
- 4 Select the name of the referential integrity relationship you want to modify in the Link Names list box.
- 5 In the Update Rules section, enable either of the following buttons:
 - Cascade — specifies that any change you make to the value in the key of the parent table is automatically made in the child table. It is the default rule for Paradox. To cascade an update across tables, Paradox must place a lock on the target table. If the lock is denied (because another user has already placed a lock), Paradox cannot perform the cascade update.

- Prohibit — specifies that you cannot change a value in the parent's key field if there are records that match the value in the child table. If the value doesn't exist in any records of the child table, you can change the parent table.
- 6 Enable the Strict R.I. check box if you want to ensure that earlier versions of Paradox (for example, Paradox for DOS) cannot access a table on which you've established referential integrity. Paradox must obtain locks on all tables involved in a referential integrity relationship when you modify it.
 - 7 Click Save.

Visual Database Designer

The Visual Database Designer is an application designed for working with the design of your databases. Using the Visual Database Designer, you can create Paradox tables, establish referential integrity between tables, view the fields of tables, and create, print, and save a layout of your database design.

The Visual Database Designer looks similar to the Data Model Designer, but their purposes are very different. The Data Model Designer lets you link tables for the purposes of creating data models used with forms and reports. The relationships that you create between tables using the Visual Database Designer are actually saved in the table structure.

With the Visual Database Designer you can

- create and edit layouts of your database design
- create and modify tables
- establish referential integrity relationships between tables
- save the database diagram layout
- print the database diagram layout



- The layout of your database design is saved in a file called DBL\$file.\$\$\$.
-

Launching the Visual Database Designer

The Visual Database Designer has its own unique environment in which you create, edit, and link tables. You can do most of the basic planning for your database within the Visual Database Designer.

To launch the Visual Database Designer

- Click Tools, Visual Database Designer.

Creating and modifying tables

You can create Paradox tables using the Visual Database Designer.

To create a table

- 1 Click Tools, Visual Database Designer.
- 2 Click Insert, New Table.
- 3 Click in the Workspace to place a position for the new table.
- 4 In the Table name dialog box, type in a name for the table.
- 5 In the Create Table dialog box, define the fields and properties for the table.
- 6 Click Create.

To modify a table

- 1 In the Visual Database Designer modeling area, select a table and click Edit, Restructure.
- 2 Using the Restructure dialog box, modify the fields and properties of the table.
- 3 Click Save.



- For more information about defining tables fields and properties, see “Creating a Paradox Table” on page 53.
 - For more information about restructuring tables fields and properties, see “Restructuring tables” on page 103.
-

Changing the database diagram layout

The Visual Database Designer is an ideal tool for viewing your database — which tables are in the database and how the tables within the database relate to one another. You can add tables to the Workspace, manipulate tables within the Workspace, change the tables viewing properties, and refresh the Workspace.

To add a table

- 1 Click Edit, Add Table.
- 2 Select the table you want to add from the table list and click the Add button.

- 3 If you want to add more tables, repeat step 2.
- 4 Click Close.

To manipulate tables

- Click and drag the title bar of a table.

To collapse and expand tables

- 1 Select a table in the Workspace.
- 2 In the Title bar of the table, click the up arrow once to collapse the table to the field and table name level.
- 3 Click the up arrow a second time to collapse the table to table name only.
- 4 In the Title bar of the table, click the down arrow to expand the information to include the field names.
- 5 Click the down arrow again, to fully expand the table information to include the name of any indexes assigned to this table.

To size Tables

- Click View, Auto Table Resize.

To refresh the Workspace

- Click View, Refresh Diagram.

Linking tables

You can use the Visual Database Designer to establish referential integrity relationships between tables. Any relationships that you establish in the Visual Database Designer are automatically saved in each table's table structure.

Once you've created a referential integrity relationship, you can select the link and open the Link Property dialog box to edit or delete the relationship.

To establish referential integrity

- 1 In the Visual Database Designer, select the field of the Child table you want to link.
- 2 Click and drag the field you selected to the field of the Parent table you want to link.

Ensure that the fields you are linking match in type and size. The Parent table's field must also be the key field.

- 3 In the Link dialog box, type a name for the referential integrity link.
The parent's key field and child field will be displayed in the columns.
- 4 Click OK.
- 5 Right-click the modeling area and select Show Referential Integrity link name.
The labeled link is shown in the modeling area represented by an arrow.

To select a link

- Click a link between two tables.
You will know that the link is selected if the link line has changed in shape and color and the two linked fields become highlighted.

To view link properties

- 1 Select the link you want to edit.
- 2 Right-click the link and choose Link Property.

To delete a link

- 1 Select the link you want to edit.
- 2 Right-click the link and choose Remove Referential Link.



- To remove a link you can also select it and press DELETE.
-



Viewing table information



The Visual Database Designer not only shows you the relationships between tables, but also visually informs you about specific tables properties and fields, such as table lookups, keyed fields, and secondary indexes.

To view table information

- Click Tools, Visual Database Designer.

The visual layout of your database is displayed in the Workspace. Each table contains icons which represent the following information:

-  blue key — indicates the field is set as a key field. If more than one field has a blue key, that table has a composite index
-  one bar — identifies a field

-  one bar with purple top — indicates a table lookup
-  two bars with an arrow — indicate that an index has been established on the field



- You can also view table information by clicking Tools, Utilities, Info Structure.

Saving a diagram layout

Once you are finished creating the database diagram layout, you can save the layout so that it will appear in the same way the next time you open the Visual Database Designer.

To save the diagram layout

- Click File, Save.

You do not need to name the database diagram layout.

Printing a diagram layout

You can print a model of a database diagram layout. Before you print a database diagram layout you can preview how it will look.

To preview the database diagram layout

- Click File, Print Preview.

To print the database diagram layout

- Click File, Print.



- You can also right-click the Workspace and choose Print Preview to preview the database diagram layout.
- You can also right-click the Workspace and choose Print Diagram to print the database diagram layout.

Navigating and Viewing tables

Paradox offers several options to make table navigation fast and easy. Once a table is open, you can move among the records by using the horizontal scroll lock or the mouse and keyboard.

In addition to navigating through tables, you can change the table view. A list of all the tables is found in the Project Viewer. When you open a table, it displays in View mode. In this mode you are able to move through the table records and change the way you view data, but you cannot edit it.

Paradox lets you view data in many different ways. You can

- use the horizontal scroll lock to freeze columns on the left side of the window. For example, in a CUSTOMER.DB Information table, you might want the Customer No. and Customer Name fields to remain in view so that you can easily tell which customer the record belongs to. The horizontal scroll lock allows you to set which fields you want to remain in view as you scroll to the right.
- use Memo View and Field View to see the full contents of certain field types such as BLOBs. Depending on the speed of your system and the size of your BLOB fields, you may find that displaying these fields can sometimes be slow. This is because memo and graphic data is stored outside the table in a separate file.
- use Tool, Quick Design to view the table quickly as a form, report, chart or crosstab.



- You can view the following information about dBASE and SQL tables using the Structure Information dialog box.
-

Navigating through table records

Paradox provides navigational buttons on the toolbar to allow you quick access to your data. You can also move through table records by using the scroll arrows and scroll bars.

To navigate through table records

- Click any of the following arrows:



to move to the first record of the table



to move up one record set (the number of records displayed in the Table Window)



to move to the previous record of the table



to move to the next record of the table



to move down one record set (the number of records displayed in the Table Window)



to move to the last record of the table

To scroll through your records

- Use any of the following scroll arrows:
 - Up and down scroll arrows on the vertical scroll bar — to scroll through a table one record at a time.
 - Left and right scroll arrows on the horizontal scroll bar — to scroll through the columns of the table.
 - Vertical or horizontal scroll bars — to scroll through the records of the table. The records themselves do not move; instead, the Status Bar displays either the range of record numbers or the field name that would appear if you released the scroll box.



- In dBASE tables, the vertical scroll box is always centered vertically when Table, Show Deleted is not checked.
- If the table is keyed, Paradox displays the range of values in the key field (or the first field of a composite key) on the Status Bar as you move the vertical scroll box.

Using the keyboard to navigate through table records

Use the following keyboard commands to navigate through table fields and records.

Key	Effect/Action
←	Selects the field to the left of the selected field. (If the selected field is the first field in the record, selects the last field of the previous record.)
→	Selects the field to the right of the selected field. (If the selected field is the last field in the record, selects the first field of the next record.)
↓	Selects the same field in the record below the current one.
↑	Selects the same field in the record above the current one.

HOME	Selects the first field in the current record.
END	Selects the last field in the current record.
CTRL + HOME	Selects the first field of the first record in the table.
CTRL + END	Selects the last field of the last record in the table.
PgDn	Displays the next set of records.
PgUp	Displays the previous set of records.
CTRL + PgDn	Scrolls the window to the next set of fields.
CTRL + PgUp	Scrolls the window to the previous set of fields.

Viewing table structure information

You can use the Info Structure command to display the structure of a table, including any key, validity check, index, table lookup, or dependent tables.

You cannot make changes to the table structure from the Structure Information dialog box; you can only view the structure.

To view table structure information

- 1 Click Tools, Utilities, Info Structure.
- 2 Double-click the name of the table whose structure you want to view.
- 3 Click any of the tabs in the Structure information dialog box.



- The Structure information dialog box also displays information about dBASE and SQL tables.

Using the horizontal scroll lock to view fields

It is likely that many of the tables you create will have too many fields to be viewed all at once. However, as you scroll to the right to view additional fields, you may want a field or two to remain in view. By default, the horizontal scroll lock is set to the left of the first column in the table so that all columns move as you scroll to the right. The horizontal scroll lock appears in the bottom left corner of the Table Window.

To set the horizontal scroll lock

- 1 Hold your cursor over the scroll lock until your cursor changes to a double-headed arrow.

- 2 Click and drag the scroll lock to the right of the column(s) you want to lock.

All columns to the left of the lock remain stationary as you scroll through the table's columns.

Viewing memo and BLOB fields

Field types that can contain BLOBs (Binary Large Objects) include binary, memo, formatted memo, graphic, and OLE fields. Paradox stores memo, formatted memo, and graphic fields in a separate file (with the .MB extension for Paradox tables or a .DBT extension for dBASE tables), not in the table itself. A Paradox table contains a portion of the field (you specify how much when you create the field), plus a pointer to the .MB file. Paradox retrieves values from the .MB file when displaying memos and formatted memos.

You can display the contents of selected memo, formatted memo or BLOB fields.

To display a memo field

- Select the field and click View, Memo View or press F2.

Paradox displays the entire contents of the field in a separate window.

To close a memo window

- Click View, Memo View or press F2.

To display a BLOB field

- Select the field and click View, Field View.

To close a BLOB window

- Press F2.

If you click on an individual memo or BLOB field, Paradox displays the contents of the field. However, the amount of text or graphic that you will actually be able to see depends on the size of the cells in the table.

To display the complete text of all memo or BLOB fields in a table

- 1 Right-click any record in the memo or graphic field, and select Properties.

- 2 Enable the Complete Display check box on the General page.

Paradox displays the entire contents of all of the records in that field. However, the amount of text or graphic that you will actually be able to read depends on the size of the cells in the table.



- If you are working with a dBASE memo field, Paradox does not store any memo data in the .DBF file. Therefore, when you disable the Complete Display option on dBASE memo fields, you do not see any of the memo. Instead, you see a marker indicating that the memo field contains data. When you click the field, Paradox displays the memo value from the .DBT file.
-

Viewing graphic data

When you place a graphic in a table, you might not be able to see all of it. You can adjust the width and height of the cells in a table to view as much of the graphic as you want. You can use Field View to display the entire graphic.

To display a graphic

- Double-click a field.

Paradox opens a window that displays only the graphic.



- If the graphic field on the form is the wrong size to display the graphic values of each record, you can use the Form Design Window to resize the field object. You can also right-click the field, click Properties, and enable the Best Fit check box on the Magnification page of the Properties dialog box.
-

Viewing quick objects

You can use the Quick commands to view a table's data in a form, chart, crosstab, or report.

To view table data in a quick form

- Click Tools, Quick Design, Quick Form.

The Form Window opens on top of the open Table Window. From the Form Window, you can use the Table View command to return to the view of the table, or you can click the name of the table in the Application Bar.

To view table data in a quick report

- Click Tools, Quick Design, Quick Report.

To view table data in a quick chart

- Click Tools, Quick Design, Quick Chart.

If you have not yet defined a preferred chart, the Define Chart dialog box opens.

To view table data in a quick crosstab

- Click Tools, Quick Design, Quick Crosstab.

If you have not yet defined a preferred crosstab, the Define Crosstab dialog box opens.



- When you view the table's data in an alternate format (like a form or report) the property settings you have chosen in the Table Window do not appear. You can customize the form or report individually to get the look you want.

Filtering tables

Sometimes you don't want to see all the data in a table, but only a subset; filters provide a way for doing this. For example, in the CUSTOMER.DB table, you might want to see only those customers in North Carolina and California. Filters let you

- display only those records whose field values meet the conditions you specify.
- display records based on any secondary index you have defined for the table.

Filters are similar to live queries. Once you filter table data, you can change to Edit Mode and update information in the selected records. Most of the operators that you can use in queries can also be used in filters. However, there are differences. For more information, see "Filters and queries compared" on page 93.

Filtering tables and fields

When you filter a table, Paradox searches the table and displays records containing values that meet the filter criteria you specify. For example, if you want to view a list of customers with the name Robertson, you could type

Robertson in the box beside the Name field. Paradox displays only the records for customers with the name Robertson. If you only wanted to view those customers with the name Robertson who lived in Nova Scotia, you could also type Nova Scotia in the box beside the State/Prov. field.

When specifying filter criteria, you can use the same keywords and symbols to specify filters that you can use in queries to specify selection conditions. If the table is keyed or has secondary indexes, you can choose which index Paradox uses to sort the filtered records. You can choose to set a filter on a composite index, but you must set ranges for multiple fields within the index. If you do choose a composite index, you have to adhere to specific rules.

You can also filter a table to show only those records whose fields contain a range of values. For example, you can have Paradox display records 50 to 100 in a table.

Setting operators and conditions in filters

Operators are symbols that represent an operation to be performed on a value or values. Use can also use either/or conditions to filter the table data. Paradox evaluates operators in filters in a certain order. In expressions containing more than one operator, the operators are evaluated in the order of precedence shown in the following table.

Precedence	Operator
1	() [] “ ”
2	* / %
3	+ -
4	= < > < <= > >=
5	NOT
6	AND
7	OR
8	, (comma)



- Any expression contained in parentheses is evaluated first, and inner levels of parentheses are evaluated before outer levels. When two or more operators of equal precedence are in a single expression, they are evaluated from left to right.
- You can set filters on forms or reports that have complex data models, the master table in a data model, and detail tables if the tables are linked in a multi-value relationship. Filters cannot be applied to detail tables if the tables are linked in a single-value relationship.

Filters and queries compared

Filters are similar to queries. Most of the operators that work in a query can also be used in a filter. However, there are differences in the kinds of expressions you can use:

- The “@” wildcard operator is not allowed in a filter.
- The “..” wildcard operator is not allowed in numeric or date fields in filters. Furthermore, this operator is allowed after the filter condition, but not before it. For example, you can type “view..” to filter for all values that contain the letters “view” (either upper or lowercase) followed by any other letters. This filter returns the values “View,” “Viewing,” “viewed,” “viewable,” and so on. Using the “..” wildcard is the only way to define a case-insensitive filter.
- Example elements are not used in filters. However, you can refer to one field from another.
- Calculated fields are not used in filters. Furthermore, math operations can be performed only on SQL tables.
- You cannot use memo, formatted memo, OLE, graphic, binary and bytes or BLOB fields in filters.
- Summary expressions (like COUNT>5) are not allowed in filters.
- In filters, parentheses can be used to nest conditions.
- The comma functions as the AND operator for top-level conditions such as >200, <300. However, in a filter, the AND operator must be used instead of a comma to express more complicated conditions such as (>100 AND <200) OR (>300 AND <500). The general rule is that you must use AND when the condition is within parentheses.
- The LIKE, AS, and SET operators are not used in filters, but the TODAY and BLANK operators are allowed.
- Any operators that change data do not function in filters.

- Checks are not used in filters, and records are displayed as if a CheckPlus is set on every field.
- Although filters cannot have multiple lines such as those used in queries, the equivalent to multiple lines is the OR keyword.
- The % (equivalent to mod) operator is supported in filters but not in queries. This operator only works on SQL tables.
- The operator precedence is slightly different from queries.

In all other respects, the types of expressions you can use in filters are the same as those used in queries.



- Although filtering a table gives you a new table view, it doesn't create a new table. Queries, however, create an Answer table that you may then rename and save.
-

Filtering a table

Once you create a table, you needn't view it in its entirety all the time. Paradox lets you pick and choose which records you want to display. You can view the entire table in a different order by choosing a secondary index view order or you can select particular records by defining one or more fields. You can also set a range of values.

To filter the view of data in a table

- 1 Open a table.
- 2 Click Format, Filter.
- 3 Enable the Order By check box to order records according to the selected index.
- 4 Select the index by which you want the filter to sort.

An asterisk (*) precedes the primary index. If the table is keyed or has secondary indexes defined, you can choose which index Paradox uses to sort.

- 5 Type the conditions for the records you want to see in the box beside each field listed in the Filters On Fields section.

To specify a range when filtering the view of data in a table

- 1 Follow steps 1-5 above.
- 2 In the Filter Tables dialog box, click Range.

- 3 In the Set Range for Index dialog box, do one of the following:
 - To specify an exact match, type the value you want to find in the Field Value box. You can only filter records based on the values in the key field(s) of the index you chose in step 3 above.
 - To specify a range of values, enable the Set Range check box.
- 4 Type the beginning and ending (if applicable) values in the Field Value boxes.
- 5 Click OK.

For example, the following filter range will display all records with Order No. 1000.00 to 1020.00:



To remove a table filter

- 1 Open a table.
- 2 Click Format, Filter.
- 3 In the Filter Tables dialog box, delete the filter condition text.

Filtering on special characters

If you are filtering on special characters, you must precede the number or literal value that can be interpreted as an operator (like “,/,\, -, +, =, etc.) with a backslash(\). In the OPAL method `setgenfilter()`, the filter criteria is put into a string and parsed to pick out numbers and operators for calculations. If the number or operator in the filter needs to be interpreted literally, it needs to be preceded by a backslash(\).

For example, to filter a table with the following records:

- 1st Base
- 1st Love
- 2nd Base
- 3rd Base

and retrieve only those that start with “1st,” the filter would look like the following:

filter = “\\1st..”

One backslash for the number and another to indicate the first backslash is not an escape sequence.



- You can only specify a range of values based on the field(s) defined in the primary (key) or secondary index you selected. If you choose a composite index (or key), you can set ranges for multiple fields within the index. For more information, see “Setting ranges on a composite index” on page 98.
- Enable the Set Range check box in the Set Range for Index dialog box to filter for partial values in alpha fields (customer records with first name beginning with A-J). You can enter A as the beginning range and J as the ending range. If you enable the Set Range check box without first placing the insertion point in a text box, Paradox automatically chooses the last field for which you have specified a value as the field for which you want to define the range of values.



- When you filter a table, the table data is not lost, you are just modifying what data you see in the table. When you delete the filter condition, Paradox re-displays all records from the table.
-

Creating and removing field filters

Just as you can filter particular records in a table, you can filter individual fields and therefore view only those records contained in that field. Once you have finished with the view, you can remove the filter.

To filter a field

- I Right-click the field you want to filter in a Table, Form, or Report Design Window and click Filter.

- 2 In the Field Filter dialog box, type the value to display.

Paradox displays only those records where the selected field contains the value you specified.

To remove a single-field filter

- 1 Right-click the field you want to filter in a Table, Form, or Report Design Window and click Filter.
- 2 Delete the text in the Field Filter dialog box.

Setting either/or conditions in table filters

You can use either/or conditions to filter the table data. Suppose you want to see customers that are either in Florida or the Bahamas. If you type Bahamas in the Country box and FL in the State/Prov. box, Paradox displays all of the customers that are in both the state of Florida and the Bahamas. (This is equivalent to an AND query.) Since no records can meet that condition, Paradox shows no records in the filtered view. To tell Paradox you want to see customers that are located either in Florida or the Bahamas, you must specify OR conditions across fields. You can do this by referring to one field from the text box of another field.

To set either/or conditions

- 1 Open a table.
- 2 Click Format, Filter.
- 3 In the appropriate field, type in the either/or condition.

For example, to see customers that are either in Florida or the Bahamas, type **FL or Country=Bahamas** in the State/Prov. text box.



- When referring to a field name that contains a space or special characters, such as those listed in “Filtering tables” on page 91, you must enclose the field name in brackets. For example, the condition City = Venice or [Customer No.] = 1560 is valid, but the condition City = Venice or Customer No. = 1560 is not. Furthermore, the condition [Sale%] < 20 is valid, but the condition Sale% < 20 is not.
- It doesn’t matter which text box you use to specify filter conditions. You could type Bahamas or [State/Prov.] = FL in the Country field. You could even type [State/Prov.] = FL or Country = Bahamas in the Name text box (or any other text box).

Filtering tables by sorting on secondary indexes

To view a keyed Paradox table in a different order from that specified by the primary index, you can use the Filter command to access and sort the table based on any secondary indexes you have defined for the table.

To use the Filter command to sort on a secondary index

- 1 Open a table, form, or report.
- 2 Click Format, Filter.
- 3 In the Filter Tables dialog box, enable the Order By check box.
- 4 Click an index from the list below the Order By check box.

Paradox creates a view of the table's data sorted by the values in the secondary index that you selected.

Setting ranges on a composite index

When filtering a table, you can only specify a range of values based on the field(s) defined in the primary (key) or secondary index you selected. If you choose a composite index, you can set ranges for multiple fields within the index. The composite index determines the order of fields shown in the Set Range for Index dialog box (where you set the range of data you want to view).

When setting ranges on a composite index, you must select a single continuous set of records on the chosen index. You do not have to specify a range for every field of the index, but you cannot skip over a field.

To set a range on a composite index

- 1 Open a table.
- 2 Click Format, Filter.
- 3 Select the composite index by which you want to filter the table.
- 4 Click the Range button.
- 5 Type the value in the Field Values box for each field. Or, if you want to set a range, ensure you adhere to the following rules:
 - If you have a three-field index, you can set a range on the first field but not the second or third.
 - You can set a range on the first and second fields but not the third.
 - You cannot set a range on the first and third fields, skipping the second.



- You cannot use a composite index on a dBASE table to set a range. You can, however, use an expression index. You can set an exact match, inexact match, or partial range on an expression index. For more information, see “Creating a dBASE expression index” in the Reference section of the online Help.
-



- You can specify exact matches and range matches on the same composite index, but you can use a range match only on the last of the fields you define a match for. Using the example of the three-field index, observe the following rules:
 - You can set an exact match on the first and second fields, and a range match on the third.
 - You can set an exact match on the first field, a range match on the second, and leave the third blank.
 - You can set a range match on the first field, and no range on the second or third.
 - You cannot set a range match on the first field and an exact match on the second or third.
-

Setting ranges or filters on a quick form

Suppose you set a range or filter from the Table window and then create a form. Even if you’ve set a different range or filter for use on the form, Paradox uses the table’s setting in both windows because the table was opened first.

Likewise, if you open a form first, then click View, Table View to open a Table window, the table will use the form’s setting. Paradox uses the settings of the window you open first.

To save a filter or range setting within a form or report

- 1 With a table open, click Tools, Quick Design, Quick Form (or Quick Report).
- 2 Click Record, Filter.
- 3 Click the Range button.
- 4 Enable the Set Range check box.
- 5 Type in the field values for the range and click OK.

- 6 Click OK.
- 7 Click View, Design Form.
- 8 Click File, Save As.
- 9 Type a name for the form or report in the File Name box and click Save.



- You can't save a range setting within a table.

Viewing indexed SQL tables in a different order

You can use the Filter Table command to sort an indexed SQL table using any of the indexes you have defined for the table.

To view an indexed SQL table in a different order

- 1 Open a table, form, or report.
- 2 Click Format, Filter.
- 3 In the Filter Tables dialog box, enable the Order By check box.
- 4 Click an index from the list below the Order By check box.

Paradox displays the table's data based on the sort criteria defined in the index.



- To specify a case-insensitive as opposed to a case-sensitive view order, you must first define the index with the specifications you want.

Sorting tables

A very important feature of any database program is the sorting operation. With Paradox, you have the option of sorting the table in many different ways. Although a primary key determines a field on which to sort, Paradox lets you maintain this key (for linking purposes) yet sort on another field by moving it to the Sort Order list box.

When you sort a table, Paradox displays the table based on the sort criteria you specify. Paradox cannot sort on the following field types:

- BLOB, BCD, logical, or bytes fields in Paradox tables
- Memo, binary, OLE, or logical fields in dBASE tables

Fields of these types are displayed in the Fields list, but are dimmed and cannot be selected for placement in the Sort Order list.

Sorting keyed tables

By definition, the key determines the physical location of the records in the table. If a table is keyed, Paradox provides you with two ways to sort the table differently. You can create a maintained secondary index which displays records based on different sort criteria without changing the physical location of the records in the table. Or, to change the physical location of the records in the table, you can sort the keyed table to a new (unkeyed) table; the original table remains unchanged.

Sorting unkeyed tables

If a table is not keyed, records appear in the table in the order in which you entered them. When you sort an unkeyed table, you change the actual location of the records in the table. You can sort an unkeyed table to itself, or create a new sorted table, leaving the original intact. For dBASE tables, the default order for records is chronological; for Paradox tables, it depends on how they are entered positional.

Sorting on a network

When you sort tables in a multi-user environment, Paradox automatically places a lock on the table you are sorting. Other users cannot modify its contents or structure. If another user has a lock on the table, you will not be able to begin sorting until that user finishes working with it. When you sort to a new table, Paradox automatically places a lock on that table as well as the original table for the duration of the sort.



- You cannot sort SQL tables.
-

Sorting a table

Paradox sorts a table according to the sort criteria you specify.

When you enable the Sort Just Selected Fields check box, Paradox sorts only on the fields that appear in the Sort Order list. All the fields of the source table are included in the resulting sorted table, but they are not sorted beyond the fields listed in the Sort Order list. If two or more records have identical values in these fields, Paradox cannot sort those records and places them in the table as a group, but unsorted within the group.

When you do not enable this option, Paradox performs the sort first on the fields in the Sort Order List, and then, if there are two or more records with

identical values in their sorted fields, on the fields remaining in the Fields List (in the order in which they appear).

To sort a table

- 1 Open a table.
- 2 Click Format, Sort.
- 3 Click the first field on which you want to sort the table from the Fields box.
- 4 Click the right arrow.
- 5 Click the Sort direction button to define whether you want to sort in ascending (+) or descending (-) order.
- 6 Do one of the following:
 - If the table is keyed, a key icon is displayed in the Sorted table section and the Same table option is grayed out. Type a name for the new table in the New Table box.
 - If the table is not keyed, enable the Use Existing Table check box to sort the table based on the new sort criteria, or enter a name for the new table in the New Table box. Paradox will create a new table based on the sort criteria without changing the original table.
- 7 Enable the Sort Just Selected Fields check box if you want Paradox to sort only on the fields listed in the Sorted Field Order box.
- 8 Enable the Display Sorted Table check box if you want Paradox to automatically display the sorted table.



- You do not have to put all the fields from the Fields list in the Sorted Field Order list. Paradox adds any fields you do not explicitly put in the Sort Order list to the end of that list before performing the sort (unless you have enabled Sort Just Selected Fields). Paradox includes all fields in the result (whether the result is the same or a new table).
 - If you do not add any fields to the Sort Order list, Paradox sorts the table in the order of the fields in the Fields list. If you enable Sort Just Selected Fields, you must place at least one field in the Sort Order list.
-

Sorting an Answer table

You can sort Answer tables from queries.

To sort an Answer table

- 1 Click the Query Window to activate it.
- 2 Click Query, Properties.
- 3 Click the Sort tab.
- 4 Click the Right Arrows button to move Answer table fields from the Answer Fields box to the Sort Order box in the order you want them to sort.

When you run the query, the Answer table is sorted in the order you specified.



- For more information, see “Querying your database” on page 309.
-

Restructuring tables

You can modify any aspect of a table at any time. Before restructuring a table, make sure no forms or reports that use the table in their data model are open. If you or any other user (in a multi-user environment) have such a document open, you will not be able to restructure the table.

When restructuring a table, you can do a number of things, including:

- add, delete, and rename fields
- add or remove key fields
- create or remove validity checks
- create or modify referential integrity relationships
- change field types
- repair damaged tables
- establish secondary indexes
- add or remove passwords
- add or remove table lookups
- view dependent tables

If fields are removed from a table when you restructure it, any corresponding field objects in forms or reports become undefined. When you return to the form or report, you can redefine them.

Restructuring on a network

When you restructure a table on a network or with more than one session of Paradox open, Paradox automatically places a lock on the table. This means other users cannot access the table during the restructuring.

If another application has started an operation using the table you want to restructure, you cannot begin restructuring until that application finishes working with the table.

Warnings for restructuring

When you restructure a table, you can make changes that could result in the loss of data. Changes such as shortening field sizes, creating validity checks, or changing field types can cause existing data to become invalid. Whenever this is the case, Paradox opens the Restructure Warning dialog box upon leaving the Restructure Table dialog box.

Temporary tables created during restructuring

Restructuring sometimes results in the creation of temporary tables, such as a Problems table, that Paradox uses to store records that are incompatible with the table as you've restructured it.

Paradox numbers these temporary tables consecutively (up to 99) and stores them in your private directory. For example, if you restructure twice, and both operations cause data loss, Paradox creates both a Problems and a Problem1 table.

Temporary tables are deleted at the end of a session. If you do not want a temporary table deleted at the end of a session, you must rename it. All temporary tables are stored in your private directory (:PRIV:).

KEYVIOL.DB tables

If you add a primary key to a table that was previously unkeyed or had different keys, you might cause key violations. You might also rearrange fields so that the key fields are no longer the first consecutive fields in the table. This means data already entered into the table violates the rules established by the key.

Paradox deletes key-violating records from your table to a temporary table called KEYVIOL.DB, located in your private directory. You can change the records in KEYVIOL.DB so they comply with the key requirements, and

then add them back to your original table using Tools, Utilities, Add. For information about adding records, see “Adding records” on page 131.



- You cannot change a table’s type. For example, you cannot change a Paradox table into a dBASE table when you restructure. You can click Tools, Utilities, Copy to copy a table of one type into a table of another type. For more information, see “Copying tables” on page 136.
- If you restructure a table that was created in Paradox for DOS in such a way that Paradox must convert it to a Paradox for Windows table, the Restructure Warning dialog box warns you of the conversion and asks you to confirm it.

Creating or removing a key in an existing table

A key is a required element for any table that is to be linked to other tables in a relational database. You can add a key to a table you have already created or you can remove an existing key.

To define a field as a key field in an existing table

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 If the field on which you want to define the key is not the first field in the table, click and drag the field to the top of the Field Roster (use the highlighted line to aid in positioning the field). Otherwise, go to step 4.
- 4 Click the key column to the left of the field for which you want to set the key. A key appears in the column.

To remove a key from a field or group of fields

- 1 Follow steps 1-2 of the previous procedure.
- 2 Click the key icon to remove it.



- If you delete a key, you must also either delete any secondary indexes, or convert them to non-maintained indexes.

Adding, deleting, and renaming fields

When you add, delete, or rename fields to an existing table, you alter any forms, reports, or queries associated with the table.

If you edit a field name in an existing table and that field name appears on any associated design documents, Paradox reconciles the change the next time you open a design document. If the field is a labeled field in the design document, Paradox does not update the label of the field to the new name. If you have calculated fields in the design document that include the original field name, Paradox deletes the calculated field from the design document when you rename the field.

To add a field to a table

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 Click in the No. column of an existing field to highlight the row.
- 4 Press INSERT to insert a new field above the current field.
- 5 Type the name of the field in the Field Name column of the Field Roster.
- 6 Click the Type column and select a field type from the list box.
- 7 Type an appropriate field size (if required) in the Size column.

To delete a field

- 1 Follow steps 1 and 2 of the above procedure.
- 2 Click in the field you want to delete and press CTRL + DELETE.
- 3 Click Save.

When you delete a field from an existing table, Paradox unbinds the field from previously created forms and reports. Since a deletion can cause loss of data, Paradox lets you confirm the deletion or cancel the operation.

- 4 Click OK to confirm the deletion or click Cancel to undo the operation.

To rename a field

- 1 Follow steps 1 and 2 from the “To add a field to a table” procedure.
- 2 Double-click the Field Name column of the field you want to rename and type the new field name.



- If you add a new field that has a default validity check on it and choose to enforce the validity check on existing data, Paradox creates the new field and places the default value in each record of the table. If you define a default validity check on an existing field that contains data, Paradox does not overwrite the existing data with the new default value.
- Paradox does not automatically add those fields to any forms, reports, or queries associated with the table — you must explicitly add them.

Packing a table

Packing a Paradox table reclaims disk space used by deleted records. Packing a dBASE table removes records that are marked for deletion from the table. Paradox lets you permanently remove these records when you restructure the table.

To pack a table

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 Enable the Pack Table check box.

Restructuring and referential integrity

When restructuring the parent table in a referential integrity relationship, you might be prohibited from performing certain restructure operations. The basic rule to remember when restructuring a parent table is that you cannot perform any operation that causes records to be removed from the table. If you remove records from the parent table, you risk orphaning records in the child table. This is in violation of the rules of referential integrity. Each record in the child table must have a valid parent record.

You can also use the Visual Database Designer to restructure tables and set referential integrity. For more information, see “Visual Database Designer” on page 81.

Guidelines for restructuring tables that are linked by referential integrity:

- If you resize any field in the parent table, you must choose to trim data that does not fit in the new field size rather than save such data in the Problems table.
- You can change field names, but not types or sizes, of fields that are part of the referential integrity definition.

- You can add a validity check to either table, but you must choose not to enforce it on existing data. (Use the Restructure Warning dialog box to make this choice.) The exception to this rule is the creation of a default validity check on a new field in the table.
- To make a parent table the child of another table, that table and all its existing child tables must be empty. For example, if ORDERS.DB is the parent table of STOCK.DB, you cannot make ORDERS.DB the child of CUSTOMER.DB unless both ORDERS.DB and STOCK.DB are empty.
- When working with tables that contain data, if you link more than two tables by referential integrity you must create the first link to the table that has no parent. For example, to define referential integrity among the CUSTOMER.DB, ORDERS.DB, LINEITEM.DB, and STOCK.DB tables, you must:
 - create the link from ORDERS.DB to CUSTOMER.DB.
 - create the link from LINEITEM.DB to ORDERS.DB.
 - create the link from STOCK.DB to LINEITEM.DB.



- To create a cyclical referential integrity relationship (as in “Table A refers to Table B, which refers to Table C, which refers back to Table A”) all the tables must be empty.
-

Viewing Dependent Tables

If the table you are restructuring is a parent table, you may be prohibited from manipulating certain data that relates to a child table. You can use the Restructure dialog box to determine what tables depend on the current table for referential integrity.

To view the dependent tables in a database

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 Click the Referential Integrity tab.
- 4 Look in the Dependent Table section to see all dependent tables.



- You can also right-click a link in the Visual Database Designer and choose Link Property. The Link Property dialog box displays the Parent's Key and Child Fields, showing you which table is the parent in a referential integrity relationship.

Changing field types

You can change (convert) a field type at any time. However, if the table contains data, you may encounter data format conflicts. See Compatible Paradox field types in the Reference section of the Online Help to determine whether the existing data will be compatible with the new field type.

Alpha field conversions

When you convert another field type to an alpha field, the result varies. All formatting and other definitions associated with the other field type are lost.

When you convert a field of another type to an alpha field, you must specify a field size. If some data already in the field contains more characters than the newly specified length of the alpha field, you can trim the data or move records containing such data to the Problems table.

If you convert between an alpha field and a date, number, short, or money field, make sure the settings in your Windows Control Panel match the settings in IDAPI.CFG.

Number, money, short, and long integer field conversions

In a Paradox table, you can convert a money, long integer, BCD, autoincrement, or short field to a number field. In fact, you can convert among all of these field types without loss of data, except when a value is too large for a short field or includes decimals. In that case, you can either trim the values or have Paradox write records containing those values to the temporary Problems table.

You can convert an alpha field to a number field if it contains no data inconsistent with a number. If data in the field is inconsistent with a number field, you must do one of the following:

- Have Paradox place the records in a Problems table.
- Delete the inconsistent data and then make the conversion.
- Insert a new field and delete the original field (losing all data).

Auto-increment field conversions

You can convert existing number, short, and long integer fields to autoincrement fields without losing data only if the number, short, or long integer field is the table's single-field primary index (key). This ensures that the data to be converted to an autoincrement field meets the requirements of being unique and sorted in ascending order.

Date field conversions

You can convert alpha and timestamp fields to date fields. Paradox saves any invalid data in a Problems table. If any record contains data in that field that cannot be interpreted as a date, Paradox removes the record and writes it to the temporary Problems table.

Here are examples of what kinds of alpha strings can and cannot be converted to dates:

Can be converted	Cannot be converted
11-Nov-18	Armistice Day
1.01.2000	New Year's Day, the year 2000
13.06.80	Herb's 29th birthday
7/04/1776	July 4, 1776
25-Dec-1066	Christmas Day, 1066
3/30/91	The 30th of March, 1991

If you customize the date format using the BDE Administrator, date values are converted according to your customized settings.

Changing a field type

You may decide that data in the table is better stored in a different field type. Be sure to check that the field type you are switching to is compatible with the current field type.

To change field types

- 1 Open a table.
- 2 Click Format, Restructure Table.
- 3 In the Field Roster, click the Type column of the field you want to change and select a new field type from the drop-down list.



- If the change causes data loss, Paradox prompts you to confirm it. If you confirm the change, Paradox writes the records containing data that could not be converted to a temporary table called Problems.
 - You can change the records in the Problems table so they comply with the new structure, then add them back into the table using Tools, Utilities, Add. For more information, see “Adding records” on page 131.
 - For more information, see “Compatible Paradox field types” in the Reference section of the Paradox online Help.
-

Repairing tables

Despite your best efforts to create a sound table, there is always the risk that the table may become damaged. For example, a power failure may cause data loss. Although Paradox offers you the option of table repair, some damage may be beyond this operation’s mandate. You should always make backup copies of your important data.

Violations

When trying to rebuild tables, you may run into problems trying to save the repaired table. This could be because the data now violates certain validity checks or because duplicate values violate the rebuilt table’s key.

If problems occur, Paradox responds as follows:

- If Paradox cannot save certain records because of data violations, it stores them in one of the Auxiliary Tables indicated on the Repair Settings page.
- The key violation table contains records that Paradox cannot save in the repaired table due to duplicate values in the table’s key. When this occurs, the first occurrence is stored in the repaired table and all duplicates are stored in the key violation table.
- Records that violate validity checks and other data-type violations are stored in the Problems table. You can view both tables by choosing Display Error Tables from the Repair Settings page.



- The Table Repair operation is used for tables only. It cannot repair other objects such as forms and reports.
-

Repairing a table

If your table becomes damaged (by a power or system failure, for example), Paradox lets you repair it. Make sure all windows are closed on the Paradox Desktop before you attempt table repair.

Rebuilt tables are always converted to the versions specified in the File Format field of the Table Information page.

To verify a table's integrity

- 1 Click Tools, Table Repair to open the Table Repair Utility dialog.
- 2 In the Select Table Name box, enter the table that needs to be repaired or browse and select it.

If the table's header is not damaged, the table's header information appears.

- 3 Choose Verify. If errors are detected, the Table Repair utility prompts whether to display them or not. If specified, it displays the table repair errors.

If errors are encountered, you can choose Rebuild to rebuild the table.

To rebuild a table

- 1 Follow steps 1 and 2 in the above procedure.

If the table's header is damaged, click Edit and enter the table's structure (or choose Borrow to copy the structure from an undamaged table).

- 2 Enter File Format and Block Size information (if not automatically displayed).

You can change the values that are displayed here.

- 3 Click the Repair Settings tab and change the backup table name if you want.

By default, the Table Repair utility supplies a backup table name of "Copy of" plus the original table name appended to it. If the table is password-protected, specify the password.

- 4 Click the Rebuild button.



- If you have problems saving the new table, it could be because of certain validity checks or key violations.
-

Changing the appearance of tables

The default view of a table is the way it initially looks when you open it. The default view depends on a number of things: your Windows screen colors; the Desktop properties you defined with Edit, Preferences; and the structure of the table. Paradox, however, gives you the option of changing the way the table looks, and the way you view data.

You can change the following features by direct manipulation:

- the order of the columns
- column width
- heading height
- spacing between records (row height)
- placement of a scroll lock on a column

You can change the following features through property inspection:



- alignment of text and data
- color of the data or the background
- typeface of the data and headings
- color and style of the table gridlines and record marker
- color and other properties for specified data ranges

A field's properties vary depending on the type of data in the field. For example, alpha field properties are different from number field properties, which are different from date properties. Changing a field's properties does not change the data or how it is stored.

Rearranging fields, columns, and rows

You can resize and rearrange the fields, columns, and rows of tables by clicking and dragging with the mouse.

The mouse pointer changes shape as it passes over parts of the table that can be moved or resized.

Pointer & Property	To manipulate
 Heading height	Drag the line above the first record number up or down.
 Row height	Drag the line under the first record number in the window up or down.



Horizontal scroll lock

Drag the double triangle icon at the lower left edge of the Table Window to the right.



Column width

Drag the top of the column's right grid line to the left or right.



Order of columns

Drag the column heading to the new location.

Rearranging fields

You can rearrange field order in the Restructure Table dialog box. You can place a field in the following locations:

- between the rows of existing fields
- in the row above the first field
- in the row below the last field

To rearrange fields

- 1 Open a table.
- 2 Click Format, Restructure.
- 3 In the Field Roster, click the number of the field you want to move.
- 4 Drag the field to the position you want it to occupy and release the mouse.



- When you view table data in an alternate format (like a form or report) the property settings you chose in the Table window do not appear. You can customize the form or report individually to get the look you want.
- You cannot move fields in a way that violates the rules for key fields. For example, a field defined as the key field must be the first field in the table.

Moving, resizing, or rotating columns

You can move, resize, or rotate the columns of any open table.

To move a column

- Click and drag the column heading to its new position.

To resize a column

- Click and drag the right grid line to the right or left to increase or decrease the width of the column.

To rotate columns

- Click a record in the column you want to move and press CTRL + R.

Paradox moves the column to the last position on the right of the table and shifts all other columns one position to the left.

Resizing rows

You can resize a table's rows to conform to the amount of information you want to include in the fields. This feature is useful if you want to view more of a memo or graphic field in table view.

To change the height of the rows in a table

- Click and drag the grid line under a record up or down.

Paradox resizes all rows to match the row height you specify.

Changing table properties

Paradox offers you the ability to change the appearance of tables by changing general attributes to specifying particular properties of individual fields.

Paradox lets you change the following properties:

- color—of table background, individual cells, grid lines, and text
- alignment—of data within a column or within the column header
- text—of the screen font for the header or data area
- grid—change the grid from the default settings of background, grid lines, and current records marker. The grid is the pattern of lines that appears between the columns (and, optionally, the rows) of the table. The record marker is the horizontal line that appears beneath the current record.

You can also change the properties of all data in a field that meets a certain requirement. For example, in the Qty field of the sample LINEITEM.DB table, suppose you want to display all quantities less than five on a white background. You can do this using the Data Dependent property. You can specify ranges that are greater than, equal to, or less than a given value. You can also combine ranges, and set separate properties for different ranges of values.

Alpha, number, short, long integer, date, time, timestamp, logical, autoincrement, and money field types (as well as dBASE character, number, float number, date, and logical field types) all have the Data Dependent property which you can use to establish a range of values for which the field's display is visually different.



- To access the Properties dialog box, you right-click the object you want to change. If you want to change the properties for all fields, press SHIFT, right-click a field, and choose Properties. To change the properties for all column headings, press SHIFT, right-click the heading, and choose Properties.
- You can change many table properties in the Table window; however, some table properties can only be changed in a data model. For more information, see “Viewing table properties in the Data Model dialog box” on page 180.

Creating new default table properties

Suppose you know that you will most often want number fields displayed in the General format, or date fields aligned left, or text displayed in blue. Paradox gives you the ability to establish default properties for each field type and store them in a default file, DEFAULT.TV (Paradox) or DEFAULT.TVF (dBASE).

You can create a default property file by creating a new table or copying an existing table that is customized with the settings you want to use as defaults.

To create default properties in a new table

- 1 Create a table in your private directory that includes one of each available field type and save this table as DEFAULT.DB.
- 2 Click File, Open, Table.
- 3 Double-click DEFAULT.DB from the file list.
- 4 Press F9 to enter Edit Mode.
- 5 Right-click each field to set the properties for that field type.
- 6 Click Format, Properties, Save to save the property settings in the DEFAULT.TV file.

Whenever you work with a table that does not have its own .TV file, Paradox applies the settings from DEFAULT.TV to it. Table-specific .TV files override the settings in DEFAULT.TV.

To create default properties by copying

- 1 Customize a table with the desired default property settings.
- 2 Click Format, Properties, Save to save the default settings.
- 3 Copy the table to DEFAULT.DB in your private directory.

Paradox copies the table's .TV file as well as the .DB file, and uses its .TV file for default property settings.



- For more information, see “Creating tables” on page 52.

Remember to use the Paradox Copy utility when copying tables. For more information, see “Copying tables” on page 136.



- If you are short on disk space, you can use Windows Explorer to delete DEFAULT.DB, and any other DEFAULT files (like .PX or .VAL files) that were copied along with the table. All you really need is DEFAULT.TV.

Saving, restoring, and deleting table properties

Saving table properties saves the appearance of the table as you have changed it. Paradox saves the properties you define in a file with a .TV extension. (Properties for dBASE tables are saved in the .TVF file.) For example, the properties you define for the CUSTOMER.DB table are saved in CUSTOMER.TV. If you try to close a Table window without saving property changes, Paradox asks if you want to save your changes.

If you change table properties but are unhappy with the changes, you can restore previous settings.

When you delete a table's unique property file (.TV or .TVF), Paradox uses default property settings.

To save table properties

- Click Format, Properties, Save to save all the property changes you make in a Table window including property changes to individual fields.

To restore table properties

- Click Format, Properties, Restore.

Paradox restores all properties to the settings that existed when you opened (or previously saved) the table properties.

To delete table properties

- Click Format, Properties, Delete.

Changing grid and record marker properties

Using the Grid Properties dialog box, you can change the color, line style, and spacing between a table's grid lines. You can also choose to hide or display the grid lines for the heading, column, and row lines. By default, Paradox does not display heading, column, and row lines.

The current record marker is a horizontal line that appears beneath the current record in a table. By default, Paradox does not display the record marker.

To format the grid lines

- 1 Click Format, Properties, Grid.
- 2 Click the Grid Lines tab.
- 3 Enable or disable any of the following check boxes:
 - Heading Lines—to display or hide the grid line below the table heading.
 - Column Lines—to display or hide the grid lines between the columns of the table.
 - Row Lines—to display or hide the grid lines between the columns of the table.
- 4 To change the color of the grid lines, click a color from the Palette.
- 5 To change the line style, click a line style in the Line Style box.
- 6 To change the spacing of the grid lines, click a spacing option from the Spacing box.
- 7 Enable the Query Look check box to move the heading line from below heading text to behind heading text.
- 8 Click Apply.

To format the current record marker

- 1 Click Format, Properties, Grid.
- 2 Click the Record Marker tab.
- 3 Enable or disable the Show Record Marker check box to display or hide the current record marker.
- 4 To change the line color, click a color from the Line Color Palette.

- 5 To change the line style, choose a style from the Line Style box.
- 6 Click Apply.

To change the grid's background color

- 1 Click Format, Properties, Grid.
- 2 On the General page of the Properties dialog box, click a color.
- 3 Click the Apply button.

If you want to create your own color, see “Changing background colors” on page 119.



- You cannot set separate properties for the heading, column, and row lines. Settings apply to all of the grid lines. To vary the look of your table, experiment by displaying or hiding different grid lines once you set grid properties.
 - If you set the grid spacing as None, you won't be able to see any grid lines.
-

Changing background colors

You can change the color of the background of any field in a table. You can also create custom colors.

For example, you could specify a blue background for a field whenever the value of the field is greater than 50 but less than or equal to 100. You could specify a red background whenever the value of the field is greater than 100.

To change a field's background color

- 1 Right-click the field you want to change and click Properties.
- 2 In the color section of the General page, click the color to which you want to change the background.
- 3 Click the Apply button.

To create a custom color

- 1 In the color section of the General page, click any of the cells in the right column of the Color box.
- 2 Click the Add Custom Color button.
- 3 In the Custom Color dialog box, enable the desired color scheme button.

- 4 Move the appropriate slider or type in values beside the color boxes to create the color mix you want.
- 5 Click OK to return to the Properties dialog box.
- 6 Click the Apply button.



- You can change the background color of all the columns at the same time by pressing Shift + F6. Click the desired color and click Apply. Paradox applies the color to all columns.
-

Defining and customizing specific field ranges

Suppose you're creating a table of donors for a certain charity. You'd like to see at a glance those who have given under \$100, those who have given between \$100 and 500, and those who have given more than \$500. Paradox lets you specify field ranges and then apply custom colors to them.

To specify a data-dependent range for a field

- 1 Right-click a field and click Data Dependent.
- 2 In the Data Dependent dialog box, click New Range.
- 3 In the Range Include Values list box, do the following:
 - type in the lower value in the range and select a comparison operator.
 - type in the higher value in the range and select a comparison operator.You can also set properties for that range of values.
- 4 Click Properties in the Data Dependent dialog box.
- 5 In the Properties dialog box, set the background color and font, style, size, and color of the text for that range of values.
- 6 Click OK to return to the Data Dependent Properties dialog box.

The Sample box displays a sample of the background color and font you have chosen for that range of values.
- 7 Click Apply Changes.
- 8 Repeat steps 2 to 4 to specify properties for other ranges of values.

Paradox changes the appearance of any cells that fall within the range of values specified.

To remove a data dependent range

- 1 Right-click a field and click Data Dependent.
- 2 In the Data Dependent dialog box, select the range you wish to remove.
- 3 Click Remove.



- The properties of a data-dependent range override those you may specify for a column. If, for example, you choose a blue background color for a column, any records that fall within a data-dependent range specification are not affected. These records continue to use the background color for the range, rather than for the column as a whole.

Changing the default system font

Paradox always uses the default system font for text in new tables and design documents. You can change the default system font at any time. When you change the default system font, the text for all tables changes to the new font except in existing formatted memo fields and in tables where you previously customized the font.

How the default system font works in forms and reports

The settings of a form or report style sheet always override the default system font. However, if the style sheet does not specify a font for a given design object, Paradox uses the default system font for new ones you create. For example, if you create a new field object, and the style sheet has no font specified for the edit region, Paradox uses the default system font for text in the edit region when you run the form or report.

To change the default system font

- 1 Click Tools, Settings, Preferences.
- 2 On the General page of the Preferences dialog box, click the Change button.
- 3 Select a font from the Change Font dialog box, and click OK.
- 4 Exit and restart Paradox.



- If you want Paradox to use the default system font for all text in an existing table, select Format, Properties, Delete. Paradox also removes any customized viewing properties you have set.

Formatting text

You can format the font, style, size, and color of the text of any heading or field in a table. You can also create and use custom colors.

To format the text in a table

- 1 Open a table.
- 2 Right-click the heading or field you want to format and select Properties.
- 3 In the Properties dialog box, click the Font tab.
- 4 Select the desired font, style, size, script, effects, and color.
- 5 Click the Apply button.

To create a custom color

- 1 Follow steps 1-2 of the above procedure.
- 2 In the Properties dialog box, click the General tab.
- 3 Click any of the cells in the right column of the Color box.
- 4 Click the Add Custom Color button.
- 5 Enable one of the following check boxes:
 - RGB—specifies that you want to change the amount of red, green, and blue in your custom color.
 - HSV—allows you to change the hue, saturation, and value of your new color.
 - CMY—specifies you want to change the amount of cyan, magenta, and yellow in your custom color.
- 6 Create the color mix using the scroll bars and value boxes.
- 7 Repeat steps 5-6 until you have your desired color.
- 8 Click OK.

Changing a formatted memo field

Once you have typed text in a formatted memo field, you may decide to change some properties of the formatting.

To format text in a formatted memo field

- 1 Right-click any record in the field and click Properties.
- 2 Click the Font tab.

- 3 Change the font, style, size, and color of the text as appropriate.
- 4 Click the Apply button to view the changes without closing the Properties dialog box.

Aligning text in a formatted memo field

To align text in a formatted memo field

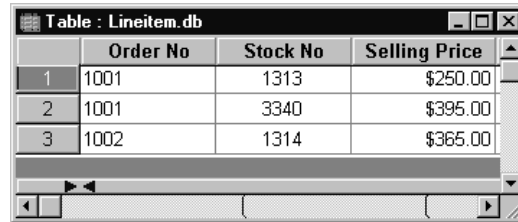
- 1 Open a table.
- 2 Double-click the formatted memo field to display the memo text.
- 3 Press F9 to enter Edit Mode.
- 4 Select the text or paragraphs you want to align and right-click and click Properties.
- 5 Click the Text tab.
- 6 Enable one of the following buttons:
 - Left—to align the text with the left side of the window.
 - Center—to center the text.
 - Right—to align the text with the right side of the window.
 - Justify—to align the text with both sides of the window.
- 7 Enable the desired line spacing button.
- 8 Click the Apply button.



- Alignment changes in formatted memo fields are applied only to individual memos. Also, any paragraph you select can have its own alignment setting.
-

Changing the alignment of heading text and data

Alignment refers to the placement of the data in the field or the text in the heading. Text and data can be aligned horizontally at the left, center, or right of the column (as illustrated) or vertically at the top, center, or bottom of the row. You can also align text and data vertically with the top, middle, or bottom of the row.



	Order No	Stock No	Selling Price
1	1001	1313	\$250.00
2	1001	3340	\$395.00
3	1002	1314	\$365.00

To change the alignment of text or data in a heading or column

- 1 Right-click the field you want to align and click Properties.
- 2 Click the Alignment tab.
- 3 Enable one of the following buttons:
 - Left—to align the data with the left side of the column.
 - Center—to center the data horizontally within the column.
 - Right—to align the data with the right side of the column.
- 4 Enable one of the following buttons:
 - Top—to align the data with the top of the row.
 - Middle—to center the data vertically within the row.
 - Bottom—to align the data with the bottom of the row.

To align text in a formatted memo field

- 1 Open a table.
- 2 Click the field of the formatted memo you want to align.
- 3 Double-click the formatted memo field to display the memo text.
- 4 Press F9 to enter Edit Mode.
- 5 Select the text or paragraphs you want to align, right-click, and click Properties.
- 6 Click the Text tab.

- 7 Enable one of the following buttons:
 - Left—to align the text with the left side of the window.
 - Center—to center the text.
 - Right—to align the text with the right side of the window.
 - Justify—to align the text with both sides of the window.
- 8 Enable the desired line spacing button.
- 9 Click the Apply button.



- Alignment changes in formatted memo fields are applied only to individual memos. Also, any paragraph you select can have its own alignment setting.
-

Data formats

In the Windows Control Panel, Regional Settings, you can declare which language you're working in and how you want your numbers, currency, times and dates to appear in Windows applications. What you specify here will be adopted by Paradox and becomes the predefined data format for your database, controlling how data is displayed in your tables, forms, and reports.

Although Paradox provides some standard data formats, you can define custom formats for number, money, date, time, timestamp, and logical fields. Specifying a data format does not change the data or how Paradox stores it, only how Paradox displays the data type.

You may decide that you want to have a certain number of decimal places, or have a negative number display with a minus sign in front. You may be dealing with a company in England and want to change your currency symbol. Perhaps you don't want the date to be displayed as month/day/year and prefer year/month/day. You may even prefer to have the date written out in full rather than annotated.

Paradox offers predefined formats for the following fields:

- money
- number
- date
- time
- timestamp
- logical



- You can also specify data formats in the BDE Administrator.

Predefined money and number formats

The format list for a number or money field shows the following predefined formats:

Format	Description
Windows \$	Uses the currency symbol and format that you defined in the Windows Control Panel.
Windows #	The default format for Paradox number fields. Paradox uses the format you specify in the Windows Control Panel.
Fixed	Displays number values with two decimal places. Trailing zeros are displayed. Thousand separators are not used. Negative numbers are preceded by a minus sign (-).
Scientific	Displays number values in exponential notation (with four decimal places), as a decimal number from 1 to 10 multiplied by a power of 10. Negative numbers are preceded by a minus sign (-). All number formats use scientific notation to display numbers that are too big to fit. The Scientific format always uses scientific notation.
General	Displays number values with up to two decimal places if the number includes a decimal value. Trailing zeros and thousand separators are not displayed. Negative numbers are preceded by a minus sign (-).
Comma	Displays number values with two decimal places. Trailing zeros are displayed. Thousand separators are used and displayed as a comma. Negative numbers are displayed in parentheses.
Percent	Displays numbers followed by the percent sign (%). For example, the value .5 is displayed as 50.0%. Thousand separators are not used. Negative numbers are preceded by a minus sign (-).
Integer	Displays whole numbers only. Decimal values are rounded when you convert to the Integer format. If you convert to a format that displays decimals, they are returned. Thousand separators are not used. Negative numbers are preceded by a minus sign (-).
DBNumeric	Uses the number format settings from your BDE configuration settings.



- If you want to define your own number and money formats, see “Creating a custom data format” on page 129.

Predefined date, time, timestamp and logical formats

This overview provides a list of predefined formats and how they are displayed. You can also define custom date formats. For more information, see “Creating a custom data format” on page 129.

Predefined date formats

The format list for a date field shows the following predefined formats:

Format	Description
DB Date	Uses the date format settings from your BDE configuration settings. One digit is used for months and days 1 through 9 and two digits for the year in the format month/day/year (for example, 1/5/58).
ISO Date	(International Organization for Standardization.) Displays dates using four-digit numbers for the year, followed by two-digit numbers for the month and day, each separated by a period (for example, 1958.01.05).
mm/dd/yy	Displays dates using two-digit numbers for the month, followed by the day, followed by the year, each separated by a slash mark (for example, 01/05/58).
Windows Long	Uses the long date format you define in the Windows Control Panel Regional Settings Properties dialog box (for example, Sunday, January 5, 1958).
Windows Short	Uses the short date format you define in the Windows Control Panel Regional Settings Properties dialog box (for example, 5/1/58).

For each format, a two-digit yy value from 00-50 (2000-2050) is assumed to be in the twenty-first century. Dates entered from 51-99 (1951-1999) are assumed to be in the twentieth century. To override the default date assumption, use a four-digit display and specify all digits of the year. For all other centuries, you must specify all four digits.

Predefined time formats

The format list for a time field shows the following predefined formats:

Format	Description
Windows Time	Uses the time format you define from the Windows Control Panel Regional Settings Properties dialog box.
hh:mm:ss am	Displays two digits of hours, minutes, and seconds, separated by colons and followed by “AM” or “PM”.
DBTime	Uses the time format settings from your BDE configuration settings.

Predefined timestamp formats

The format list for a timestamp field shows the following predefined formats:

Format	Description
Win. DateStamp	Uses the date and time formats you define in the Windows Control Panel Regional Settings Properties dialog box.
hh:mm:ss am mm/dd/yy	Displays hours, minutes, and seconds (2 digits each), separated by colons and followed by “am” or “pm” and the month, day, and year.
DBTimestamp	Uses the timestamp format settings from your BDE configuration settings.

Predefined logical formats

The format list for a logical field shows the following predefined formats. These formats let you choose what values to accept as true and false in the logical field.

- Male/Female
- True/False
- Yes/No

Specifying the format for numeric data

Paradox offers the user the ability to define the way in which numeric data will be displayed.

To specify the format in which a number, money, date, time, timestamp, or logical field is displayed

- 1 Right-click a numeric field and select Properties.
- 2 Click the Format tab.
- 3 Select one of the formats from the Format list box.

To create a new format

- 1 Follow steps 1-2 from the above procedure.
- 2 Click the Create New Format button.
- 3 Click the Create button.
- 4 Type a new name in the Name box.
- 5 In the Number format Section, define the new Name format.
- 6 Click OK.



- For more information, see “Creating a custom data format” on page 129.
-

Creating a custom data format

You can define custom formats for number, money, date, time, timestamp, and logical fields. Specifying a data format does not change the data or how Paradox stores it, only how Paradox displays the data type.

The procedure for all data types is similar to the following procedure.

To create a custom data format

- 1 Right-click a field (one of the types listed above) in an open table and click Properties.
- 2 In the Properties dialog box for the specific field, click the Format tab.
- 3 Click the Create New Format button.
- 4 In the Existing Formats panel, click an existing format as the base for the new format.
- 5 In the Select Number Format dialog box, click the Create button.
- 6 In the Name text box, type a name for the format.

You must give each format a unique name, regardless of the data type it applies to. For example, you cannot give a number format and a date format the same name.

- 7 In the Format panel, choose properties for the format. For details about each setting, click Help in the dialog box.

If you want to use a Windows Control Panel default format for a particular option, right-click that format option's text box. You'll see a menu of defaults you can use.

- 8 Click the Add Format button to add the new format to the Existing Formats list.



- Set the Windows number and money formats from Regional Settings in the Windows Control Panel.
-

Changing or deleting a custom data format

You can change only custom formats, not Paradox-provided formats.

The procedure for changing or deleting custom number, money, date, time, timestamp, and logical field formats is similar for all.

To change a custom format

- 1 Right-click a field (one of the types listed above) in an open table and click Properties.
- 2 Click the Format tab.
- 3 Click the Create New Format button.
- 4 In the Existing Formats panel, click the format you want to change.
- 5 Click the Change button.
- 6 If you want to change the name of the format, type a name for the format in the Name box.
- 7 In the Format panel, choose properties for the format. For details about each setting, click Help in the dialog box.

If you want to use a Windows Control Panel default format for a particular option, right-click that format option's text box. You'll see a menu of defaults you can use.

- 8 Click the Accept button to verify the changes to the format.

To delete a custom format

- 1 Right-click a field (one of the types listed above) in an open table and click Properties.
- 2 Click the Format tab.
- 3 Click the Create New Format button.
- 4 In the Existing Formats panel, click the format you want to delete.
- 5 Click the Delete button.

Adding, moving, and subtracting table records

Paradox has several utilities available to help manipulate records. For example, you can add (copy) all the records from one table to another table with the same structure. You can move or reassign dependent records to a new parent or master table. You can delete records without searching for them by creating a subtraction table that exactly matches the tables from which you want to cull records. (When you enter a record in the subtraction

table, that record is automatically deleted from the table.) Finally, you can empty tables of all records while retaining the table's structure and validity checks.

Adding records

You can use the Add command to add a copy of the records in one table to another, provided the tables have the same structure. The Add command allows you to add new records, update existing records, or both.

Windows lets you open several instances of the same table at the same time, so you could be considered another user of the table, preventing the records from being added. You can add records to an open table only if you are viewing the table; you cannot add records to a table that is open in Edit Mode.

Some field type conversions can result in invalid records being written to the temporary Problems table. If this happens, edit the records in the Problems table and then add them again. The Problems table is not generated for SQL tables; the invalid records are dropped.

When you add records to tables using the Add command, Paradox acquires a read lock on the source table and a write lock on the table you add records to. Until the records are added, other users cannot change the contents or structure of either table, and cannot perform any operation that requires a write or exclusive lock on the target table. If another user has already placed a write or exclusive lock on either table, you must wait until the lock is removed before using Add.

Rules for Adding records from another table

- The table you add records to can have more fields than the source table, as long as the first fields of the table you add the records to are compatible with all fields of the source (compatible fields types in the same order). Paradox places null values in the extra fields.
- The source table can have more fields than the table you add the records to, as long as the fields of the table you add the records to are compatible with the first fields of the source (compatible field types in the same order). Paradox ignores the extra fields.
- If the table you add the records to is keyed, the added records must conform to the rules of the key. Paradox places records that do not conform in the temporary KEYVIOL.DB table in your private directory. The source table is never changed during an Add operation; it does not matter if it is keyed or not.

Adding records to a different table type

The two tables you use in the Add operation must have compatible (though not necessarily identical) field types in the same order. For fields to be compatible, Paradox must be able to change from the existing field type to the new field type in a Restructure operation. For example, Paradox number (N) and money (\$) fields are compatible, but Paradox number (N) and graphic fields (G) are not.



- For more information, see “Compatible Paradox field types” in the Reference section of the Paradox online Help.
- For information about compatible field types for SQL tables, see your SQL Links documentation.

Adding records from another table

To quickly add many records to a table, you can merge the records from another table that has the same structure. The two tables can be of different types, as long as their fields are compatible. You can perform an Add operation across directories.

To add records from another table

- 1 Click Tools, Utilities, Add.
- 2 In the Add Records In dialog box, select the table from which you want to add records.
- 3 Click OK.
- 4 In the Add Records To dialog box, select the table to which you want to add records.
- 5 Enable one of the following buttons:
 - Append—to add records to the target table without affecting existing records.
 - Update—to update records that already exist in the target table. Any records in the source that don’t match the target table are not added.
 - Append And Update—to overwrite matching records and add new records to the target table.



- To verify that the source and destination tables are suitable for this procedure, see “Adding records” on page 131.
-

Moving records

In certain situations, you may have a record in one table that corresponds to a record in another table. This can happen in a referential integrity relationship where one record in a parent table is related to one or more records in a child table. It can also occur in a multi-table form where one record of the master table is related to one or more records in the detail table.

For example, suppose you have a table with a list of salespersons. This table, the parent table, has a child table called Customers. (Referential integrity will be established on a common Salesperson ID field). Each salesperson can have many customers assigned to them, but only one salesperson can be assigned to a customer. This is called a one-to-many relationship. Suppose that a salesperson named Jones has fifty customers assigned to him. In the CUSTOMER.DB table, fifty customers have Jones listed as their salesperson. If Jones decides to leave the company, those fifty customers will have to be reassigned to another salesperson. This is called moving dependent records.

You can use the Move Help command to move or reassign a dependent record from one master record to a different master record.

Moving dependent records

Paradox lets you move or reassign dependent records.

To move dependent records

- 1 Open the dependent (child) table.
- 2 Press F9 to enter Edit Mode.
- 3 Select the record that you want to move or reassign by clicking the field of the record that corresponds to the first field of the master table in a referential integrity relationship. You can click any field of a detail table.
- 4 Click Record, Reference, Move Help.
- 5 In the Move Help dialog box, click the new master record.

Subtracting records

Using the Subtract command, you can remove the records from one table that match the records in another table (called the subtraction table). You can

subtract records only from a keyed table. During a subtract operation, Paradox removes any record that contains a value in its key that exactly matches the corresponding field(s) of a record in the subtraction table.

Suppose you wanted to pare down your customer records to include only those customers who answered your last mass mailing. You could use the Subtract command to remove from the customer information table all of the records that matched records in another (called the subtraction table).

First, you would create a table containing the names of all of the customers who didn't answer your mailing list. When you used the Subtract command, Paradox would match the list of names of users who didn't answer the mailing list to the names in the customer information table, and would then remove records that match. The result is a smaller customer table containing only the names of those customers who responded to the last mailing. Paradox deletes the rest of the records.

Rules for subtracting records

- The table from which you want to subtract records must be keyed.
- The two tables you use in the Subtract operation must have compatible structures. This means compatible fields in the same field order. This can be easily achieved by borrowing the original table's structure.
- If the table you subtract from is the parent table in a referential integrity relationship, the Subtract operation will only subtract records that do not exist in the child table. You must first either delete the referential integrity (by restructuring the child table) or delete the related record in the child table.
- Windows lets you open several instances of the same table at the same time, so you could be considered another user of the table, preventing the records from being subtracted. You can subtract records from an open table only if you are viewing the table. You cannot subtract records from a table that is open in Edit Mode.

Subtracting records on a network

When you use the Subtract command to subtract records, Paradox needs to acquire a read lock on the table that contains the records you are subtracting and a write lock on the table you are subtracting records from. This means that until the records are subtracted, other users cannot change the contents or structure of either table or perform any operation that requires a write or exclusive lock on either table.

If another user has already placed a write or exclusive lock on either table, you must wait until the lock is removed before using Subtract.



- The Subtract command is not like a query. When you subtract records from a table, you are deleting matching records.
- Because dBASE and SQL tables do not support Paradox keys, you cannot subtract records from dBASE or SQL tables. Instead, use a DELETE query. You cannot use an SQL table as the source of a subtract operation.

Subtracting a record

Once you have created a subtraction table that contains the records you want to eliminate, the Subtract command lets you subtract records from one table that match records in the subtraction table. To verify that the tables meet Subtract command requirements, check the rules listed in “Subtracting Records” on page 133.

Warning!

- The Subtract command is not like a query. When you subtract records from a table, you are deleting matching records from other tables.

To subtract records from a table

- 1 Click Tools, Utilities, Subtract.
- 2 In the Subtract dialog box, select the table that contains the records you want to match. This is your subtraction table.
- 3 Click OK.
- 4 In the Subtract Records From dialog box, select the table from which you want to subtract records.

Copying, renaming, emptying, and deleting tables

Once you’ve created and customized a table, Paradox gives you the options of copying, renaming, or even deleting it.

Copying tables

You can copy tables, forms, reports, queries, scripts, SQL files, libraries, data models, style sheets, and text files from within Paradox.

For best results, always use the Paradox Copy utility to copy Paradox or dBASE tables and other Paradox objects. Using the DOS COPY command or Windows Explorer may not copy all related files that make up a table (for example, the files containing a table’s primary index, secondary indexes, validity checks, or BLOB data). The Paradox Copy command, however, copies all files correctly.

When you copy a table, Paradox copies both its structure and the data contained in it. Paradox also copies the table's

- key (primary index)
- secondary index(es) (except .NDX files on dBASE tables)
- validity checks
- referential integrity
- table properties (as you've set them in the Table Window)

Renaming tables

If the mandate of your company or project changes, you may want to rename your tables. Paradox makes it easy to rename tables.

Deleting tables

You can delete tables, forms, reports, queries, scripts, SQL files, libraries, data models, and style sheets from within Paradox.



- Windows lets you open several instances of the same table at the same time, so you could be considered another user of the table, preventing the records from being copied. Be sure to close the Table Window and any of its associated document windows before using Copy.
-

Copying tables

Paradox lets you copy tables while keeping the table structure intact.

- 1 Click Tools, Utilities, Copy from the menu.
- 2 Select the table you want to copy and press OK.
- 3 Type the name of the new table

Copying tables on a network

When you copy a table, Paradox must acquire a read lock on the original table and an exclusive lock on the copy. Therefore, no user can change the contents or the structure of the table you're copying during the Copy operation. If you copy to an existing table, there can be no locks open on that table. If there is a record lock, write lock, or exclusive lock on the table you're copying, you won't be able to make the copy until the lock is removed.



- These elements are copied only when you copy the table to another table of the same type. That is, they are copied only when you copy a Paradox table to another Paradox table or a dBASE table to another dBASE table.
-

Renaming tables

When renaming a table, Paradox must acquire an exclusive lock on the table. An exclusive lock means

- no user can access the table in any way
- if there is a lock of any type open on the table, you must wait until it's released before you can use the Rename utility
- if you rename an object with an existing object's name, Paradox deletes the existing object

To rename an open table

- 1 Click Tools, Utilities, Rename.
- 2 Type a new name for the table in the Rename dialog box.

Paradox renames the table and any open forms and reports associated with it.



- Be careful when renaming tables. Once renamed, a table can't be found by associated documents. Forms, reports, or queries that refer to a table under one name won't be bound to the table under its new name. The next time you open an unbound object, Paradox asks you to supply the name of the table to which you'd like it to be bound.
 - You cannot rename a table to change its type. A Paradox table must be renamed as a Paradox table, and a dBASE table must be renamed as a dBASE table.
 - You cannot rename a table that is identified as the parent table in a referential integrity relationship. You must first either delete the referential integrity (by restructuring the child table) or delete the child table.
-



- You can avoid problems with forms and reports by having them open in their Design Windows while you rename the table. Paradox automatically modifies them with the new table name. (You must save the forms and reports to make the change permanent.)
 - When renaming an object, you can type a full path when you type the object's new name. This both renames the object and moves it to a new location.
-

Emptying tables

You can use the Empty command to remove all records from a table, leaving the table's structure (including all keys, indexes, and validity checks) intact. You can use Empty on Paradox, dBASE, and SQL tables. When you empty a dBASE table, all records in the table are marked as deleted.

When you use Empty, Paradox must acquire an exclusive lock on the table. This means that no user can access the table in any way. If there is a lock of any type open on the table, you must wait until it is released before you can use the Empty utility.

To empty a table

- 1 Click Tools, Utilities, Empty.
- 2 In the Empty dialog box, select the table you want to empty.



- You cannot empty a table that is identified as the parent in a referential integrity relationship. You must first either delete the referential integrity (from the child table) or delete the child table.
-

Deleting tables

Paradox arranges data in tables. However, one table in Paradox may involve more than one DOS file. Always use the Paradox Delete command to delete tables from within Paradox. Using the DOS DELETE command or the Windows Explorer may not delete all related files that make up a table (for example, the files containing a table's primary index, secondary indexes, validity checks, referential integrity, or BLOB data). The Paradox Delete command, however, deletes all files correctly.

Deleting tables on a network

When you use Delete to delete a table, Paradox must acquire an exclusive lock on the table. This means

- no user can access the table in any way.
- if there is a lock of any type open on the table, you must wait until it's released before you can use the Delete utility. This means you cannot delete a table that is open on your Desktop.

Windows lets you open several instances of the same table at the same time, so you could be considered another user of the table, preventing the records from being deleted. Be sure to close the Table Window and any of its associated document windows before using Delete.

To delete a table

- 1 Click Tools, Utilities, Delete.
- 2 In the Delete dialog box, select the table you want to delete.



- Be careful when deleting objects. You can't undo a deletion. Be sure that a table isn't used in any forms, reports, or queries before you delete it. Forms, reports, or queries that depend on the table are not deleted when the table is deleted.
 - You cannot delete a table that is identified as the parent in a referential integrity relationship. You must first either delete the referential integrity (from the child table), empty the child table, or delete the child table.
-

Locking tables

There are several kinds of locks in a multi-user environment. For example, when you edit a value, you see the message "Record is now locked" in the Status Bar. Locks prevent two users from editing the same record at the same time. As soon as you move off the field, Paradox automatically unlocks the record.

You can also manually lock and unlock tables, using the Set Locks command. The locks controlled by the Set Locks command

- lock the entire table
- provide varying levels of protection
- must be explicitly placed and removed

This table summarizes users' rights under different levels of locks placed from the Desktop using the Set Locks command. The lock levels are arranged in order of increasing strength.

Lock level and Your rights	Other users' rights and Locks other users can place
None, None	All, All*
Open, Read (write if no other user has a read lock)	Read/Write, All except exclusive if no record lock in place. Otherwise only Open.
Read, Read (write if no other user has a read lock)	Read, Open/Read
Write, Read/Write	Read, Open
Exclusive, All	None, None
Image	Other users sharing the table can't modify its properties

* No Lock means no Desktop-level locks are placed by you. If another type of lock is in place (a record lock or open lock), you cannot obtain an exclusive lock.



- Paradox maintains a Desktop-level lock until you exit Paradox or remove the lock (select No Lock).

Displaying table locks

You can display the type of locks placed on tables as well as who has placed each lock.

To display table locks

- 1 Click Tools, Security, Display Locks.
- 2 In the Select File dialog box, select the table whose locks you want to display.
- 3 Click Open.

Paradox displays the locks that have been placed on the table and who placed them.

This column	Shows
Type	What type of lock is on the table.
Username	The name of the person who placed the lock.

Net Session	The session number of the person who placed the lock.
Our Session	1 means the lock is yours. 0 means another user placed the lock.
Record Number	Which record is locked (if the lock is a record lock, not a table lock).



- The Locks table always includes a lock placed by you. Paradox automatically places this lock on the table when it checks its locks. Paradox removes this lock immediately after gathering lock information about the table. By the time you see this lock in the Locks table, it has been removed.

Locking a table

You can lock tables to prevent other users from opening or editing them.

To lock a table

- 1 Click Tools, Security, Set Locks.
- 2 In the Table Locks dialog box, select the table you want to lock. By default, the Table Name list displays tables in the working directory.
- 3 Enable any of the following buttons:
 - Read Lock—to prevent other users from writing to the table and prevent other users from placing a lock on the table that prevents you from reading it. Your right to read is guaranteed.
 - Write Lock—to be able to read and write to the table and prevent other users from writing to the table.
 - Exclusive Lock—to prevent other users from reading or writing to the table.
 - No Lock—to remove a lock from the table.
 - Open Lock—to prevent other users from placing an exclusive lock on the table.



ENTERING AND EDITING TABLE DATA

4

Once you create a table, you can begin entering data. Paradox provides many different ways to enter and edit data. Depending on the task, different Paradox commands will be the most useful and convenient. For example, if you are adding or updating records with records that exist in another table, you can use the Add command to append and update table records. If you are editing specific values within a field, you can use the Locate And Replace command. When you are working with a single record or field, Paradox provides you with a full set of standard editing commands such as Cut, Copy, Paste, and Undo. To prevent users from editing the data, Paradox automatically locks a record when you begin editing and removes the lock once you leave the record.

Paradox automatically saves the data as soon as you leave a record, so you do not need to use the Save or Save As commands to save table data.

You can enter data into tables directly, use Lookup tables, or use design forms to enter data into one or more tables. In order to enter or edit data, Paradox requires you to change to Edit mode. Once you're in Edit mode, you can move the insertion point to any of the table's (or form's) fields and begin typing.

Data entry basics

Paradox offers many frameworks for data entry and editing. You can delete entire fields immediately or go to Field View to modify your edits. Another

option is Using Memo View to edit text in a word processing environment. To facilitate editing, Paradox offers tools and keyboard shortcuts. For example, selecting cut and paste to move data or pressing HOME to move the cursor to the first field in a record.

Editing data

When you first open a table, you are in View mode. Before you can enter data into your table, you must be in Edit mode. Since Paradox highlights the entire field, you can eliminate all the data at once; alternatively, you can go into Field View to edit data selectively.

To change to Edit mode

- Press F9.

To return to View mode, press F9.

To edit field content

- 1 In Edit mode, click a field.
- 2 To delete the entire field content, press DELETE.
- 3 To delete a word or number from the field, double-click the item to highlight it and press DELETE.
- 4 Type the new information.

To edit part of a field with Field View

- 1 Open a table.
- 2 Press F9 to enter Edit mode.
- 3 Click the field you want to edit.
- 4 Click View, Field View.
- 5 Edit the value in the field.

If you don't like the changes you've made to a field, press ESC before leaving it. This will delete the data.

When you move to another field, Paradox exits Field View (though you are still in Edit mode). If you want to move from field to field and remain in Field View, click View, Persistent Field View. To exit Persistent Field View, click View, Persistent Field View.



- If you enter Field View on a memo, formatted memo, graphic, or OLE field, Paradox places the selected field's value on top of the table. This is called Memo View. Memo View provides you with greater use of the keyboard.

Edit commands

With a table or form open in Edit mode, you can use the following commands. You can access these commands by clicking Edit on the menu bar.

Choose	To
Undo	Undo all changes to the current record. This does not undo any changes you posted. You must choose Undo before leaving the record.
Cut	Delete a value from a selected field or fields in a table (or form) and place it on the Windows Clipboard.
Copy	Copy a value from a selected field or fields in a table (or form) and place it on the Windows Clipboard. In a Table window, you can copy more than one field at a time. When you make your selection, lines appear around the selected data.
Paste	Paste the contents of the Windows Clipboard into the selected field.
Paste Special	Establish a link using Dynamic Data Exchange (DDE) from another Windows application to your table.
Copy To	Copy the current selection to an external file.
Paste From	Paste a value from an external file into the selected field.
Delete	Remove the value. Paradox does not place it on the Windows Clipboard. Note: You can remove an entire record with Edit, Delete but not with Edit, Cut.
Select All	Select all fields in the table (the entire table). Paradox places a box around the table.



- You can paste only a valid value into a field. For example, you cannot paste a graphic value into an alpha field.



- In addition to the usual Edit menu commands, you can press CTRL + D in any field to copy a field value from the record above it.
 - To insert today's date in a date field, press SPACEBAR three times. Paradox adds the three elements of a date separately.
-

Using Memo View to enter and edit memo and formatted memo text

Entering data in memo and formatted memo fields is similar to entering data in alphanumeric fields. However, in memo and formatted memo fields, Paradox places no limits on the amount of data you can enter. When you're editing a memo or formatted memo, you can use Memo View. Editing in Memo View gives you some word-processing capabilities and gives your keyboard greater functionality than in Field View.

You can enter as much data as necessary in a memo or formatted memo field. Text automatically wraps at the right side of the window. Changing the size of the window changes the text wrapping. For more information about wrapping text, see "Using Word Wrap" on page 455.

To view and enter memo data

- 1 Open a table or form.
- 2 Click a memo field to select it.
- 3 Press F9 to switch to Edit mode.
- 4 Click View, Memo View.
- 5 Type and edit memo text as desired.

For a complete list of keys you can use in Memo View, see Memo View keys in the Reference section of the online Help.

- 6 Once you finish editing the memo, press SHIFT+F2 to close Memo View.

Paradox saves the data in the memo field when you exit Memo View. When you return to the table, the amount of memo text visible depends on the column width and the field size of the memo field. For information on resizing columns and rows, see "Moving, resizing, or rotating columns" on page 114 and "Resizing rows" on page 115.

To change the properties of formatted memo text

- 1 Click a memo field to select it.
- 2 Click View, Memo View.
- 3 Select the text you want to change.

- 4 Right-click and choose Properties.
- 5 Click the Font page.
- 6 Adjust the font, color, and size of the text.
- 7 Click the Text page.
- 8 Adjust the alignment and spacing of the text.
- 9 Click Apply.



- When entering data in a memo field using a form, you can't change the field size. To do that, you must click the Design toolbar button to open the Form Design Window. From the Form Design Window, you can place horizontal or vertical scroll bars on the field. This way, you can keep the field small but view all of its contents.
- When viewing a form, Paradox does not display a special window to show you the contents of a memo or formatted memo field. These fields always appear in the size and shape you specify from the Form Design Window.

Shortcuts for faster data entry

Use these keyboard shortcuts for faster data entry. You can also use the navigation buttons on the toolbar.

Press	To
HOME	Move to the first field of the table, remaining on the selected record.
CTRL + HOME	Move to the first field of the first record of the table.
END	Move to the last field of the table, remaining on the selected record.
CTRL + END	Move to the last field of the last record of the table.
CTRL + BACKSPACE	Delete the word to the left of the insertion point. Note: CTRL + BACKSPACE works only when you are in Field View and do not have text selected.
CTRL + D	Duplicate the information from the record above the selected field to the selected field.
ESC	Undo a field edit (you must press ESC before you leave the field).
SPACEBAR	Enter current date, time, or both in date, time, or timestamp fields. You must press SPACEBAR for each part of the field's format.

Why can't I leave a field?

The Status Bar at the bottom of the desktop displays the problem. If you cannot see the Status Bar, maximize the Paradox window.

If you can't leave a field, it may be because the value you have or have not entered violates the validity checks, table lookup, referential integrity relationships or key. Alternatively, you may have tried to enter data that is incompatible with the field type. To find out what type of values you need to enter, you will want to view the table's structure to see what rules have been defined for the field.

To move off a field in which you've inserted an incorrect value

- Delete the value in the field by pressing CTRL + BACKSPACE.

To view the data entry rules defined for a field

- 1 Click View, Table Structure.
- 2 Click one or more of the following tabs:
 - Field Roster—to view any validity checks.
 - Table Lookup—to view any table lookup details.
 - Referential Integrity—to view any parent tables (to which you can refer for valid values for that field).
- 3 Once you discover what types of values are acceptable for the field, click Done.

Inserting, posting, and deleting records

Paradox makes it easy to insert records into existing tables. Once you have inserted a record and entered data, you can save your record by moving off that field. Alternatively, you can save your data without moving off the record. This is called posting a record. If you no longer need the record, you can delete it.

Inserting records

You will often find it necessary to insert new records in your tables. Perhaps you have a new customer, product, or vendor. Paradox lets you insert records easily and quickly.

To insert a record

- 1 Open a table or form.
- 2 Press F9 to switch to Edit mode.
- 3 Put your insertion point where you'd like the record inserted.
- 4 Press INSERT. Paradox opens a new blank record above the insertion point position.

You can also insert a new blank record by navigating past the last record in a table.

- 5 Enter your data.

Paradox posts the record as soon as you move off the record.



- If you insert a record into a filtered view of a table's data or a direct query view, and the record does not meet the criteria established by the filter or query, you won't see the record when it is posted.
- When working in a single-record form, inserting a record seems like inserting a blank screen. When you press INSERT or click Record, Insert, the record values appear blank. This is because Paradox has both inserted and moved to the new blank record.



- To add records from another table, you can use the Add command. For details, see "Adding records from another table" on page 132.

Posting a record

Saving a record is often called posting or committing a record. When working in a multi-user environment, other users do not see changes you've made until you've posted them. You can save a new record without moving off of it. If the table is keyed, Paradox automatically moves the record to its correct location in the table. If the table is not keyed, the new record stays where you added it.

To save a record without moving off it

- Click Record, Post/Keep Locked.



- When you post a record in a keyed table, Paradox automatically moves it to its proper position in the table. If the record's proper position is off screen, the record may seem to disappear as it is posted. However, if you look at the record count on the Status Bar, you'll see that the record has been added. Your view of the table might not change when Paradox posts the record, but the insertion point remains where it was when you pressed INSERT.

Deleting fields and records

You will often want to delete data from individual fields if the information is incorrect. You will want to delete records when, for example, you lose a customer or when a product becomes obsolete.

Warning!

If you accidentally delete the wrong field, click Edit, Undo immediately.

To delete data from a field

- 1 Press F9 to enter Edit mode.
- 2 Click the field you want to delete to select it.
- 3 Click Edit, Delete.

If you only want to delete part of a field, press F9 to enter Edit mode, and then click View, Field View. Select the data you want to delete and click Edit, Delete.

To delete records

- 1 Open a table or form.
- 2 Press F9 to switch to Edit mode.
- 3 Click any field in the record you want to delete.
- 4 Press CTRL + DELETE to delete the record.



- You cannot retrieve deleted records from Paradox tables. Deleting a record in a dBASE table does not permanently remove it. You can view deleted dBASE records with the Show Deleted command.



- You can also use the Cut command to remove data and store it on the Clipboard.
 - Deleting records does not reclaim disk space. To delete all records and reclaim disk space click Tools, Utilities, and Empty.
-

Cutting, copying, and pasting data

In addition to typing values in fields, you can cut or copy data from one field and paste it into a different field or a different application. Data you cut or copy remains on the Windows Clipboard until you change it, clear it, or exit Windows.

Things to remember about pasting

- The latest contents of the Clipboard are not deleted when you paste, so you can paste as many times as you want.
- You cannot paste multiple field values back into a table. You can, however, paste them into any other application which accepts them (for example, Quattro® Pro).
- You can use Edit, Paste From to paste data from external files. For more information, see “Pasting from a file” on page 155.
- You can use Edit, Paste Special to create DDE and OLE links. For more information, see “Inserting an OLE object linked to part of a file” on page 483 and “Using Paradox as a DDE server” on page 488.

Cutting and pasting data

If you decide that you want to move the contents of a field, a portion of a field, multiple fields, an entire column or row of data, or even all the fields in your table, you can cut and paste the data to another location.

To cut and paste an entire field

- 1 Press F9 to enter Edit mode.
- 2 Click the field to select it.
- 3 Click Edit, Cut.

The field you just cut disappears from the work area but is held by Paradox on the Clipboard.

- 4 Go to the location where the cut data is to be placed.
- 5 Click Edit, Paste.

To cut and paste multiple fields

- 1 Press F9 to enter Edit mode.
- 2 Click and drag the mouse diagonally until a box encloses all of the fields you want to cut.
- 3 Follow steps 3 to 5 in the previous procedure.

To cut and paste an entire column of data

- 1 Press F9 to enter Edit mode.
- 2 Double-click the column heading to select the column.
- 3 Follow steps 3 to 5 in the “To cut and paste an entire field” procedure (above).

To cut and paste an entire row (record)

- 1 Press F9 to enter Edit mode.
- 2 Double-click an unselected record number. (If the record number is selected when you double-click, you enter Field View).
- 3 Follow steps 3 to 5 in the “To cut and paste an entire field” procedure (above).

To cut and paste all fields in a table

- 1 Press F9 to enter Edit mode.
- 2 Click Edit, Select All.
- 3 Follow steps 3 to 5 in the “To cut and paste an entire field” (above).

To cut and paste a portion of a field’s data in Field View

- 1 Press F9 to enter Edit mode and then click View, Field View.
- 2 Select the part of the field you want to cut.
- 3 Click Edit, Cut to cut the portion you’ve selected.
- 4 Go to the location where the cut data is to be placed.
- 5 Click Edit, Paste.



- You can cut, copy, and paste data to and from files.
-

Copying and pasting data

If you decide that you want to copy the contents of a field, a portion of a field, multiple fields, an entire column or row of data, or even all the fields in your table (while leaving the original data intact), you can copy and paste the data to another location.

To copy and paste an entire field

- 1 Press F9 to enter Edit mode.
- 2 Click the field to select it.
- 3 Click Edit, Copy.
The field you just copied remains unchanged.
- 4 Go to the location where the copied data is to be placed
- 5 Click Edit, Paste.

To copy and paste multiple fields

- 1 Press F9 to enter Edit mode.
- 2 Click and drag the mouse diagonally until a box encloses all of the fields you want to copy.
- 3 Follow steps 3 to 5 in the “To copy and paste an entire field” procedure (above).

To copy and paste an entire column of data

- 1 Press F9 to enter Edit mode.
- 2 Double-click the column heading to select the column.
- 3 Follow steps 3 to 5 in the “To copy and paste an entire field” procedure (above).

To copy and paste an entire row (record)

- 1 Press F9 to enter Edit mode
- 2 Double-click an unselected record number. (if the record number is selected when you double-click, you enter Field View).
- 3 Follow steps 3 to 5 in the “To copy and paste an entire field” procedure (above).

To copy and paste all fields in a table

- 1 Press F9 to enter Edit mode
- 2 Click Edit, Select All.
- 3 Follow steps 3 to 5 in the “To copy and paste an entire field” procedure (above).

To copy and paste a portion of a field’s data in Field View

- 1 Press F9 to enter Edit mode and then click View, Field View.
- 2 Select the part of the field you want to copy.
- 3 Click Edit, Copy.
- 4 Go to the location where the copied data is to be placed.
- 5 Click Edit, Paste.



- You can cut, copy and paste data to and from one file to another.
-

Copying to a file

You can use the Edit, Copy To command to copy field values to external files. You can copy values in graphic, binary, memo, and formatted memo fields to non-Paradox file formats without using the Export command. You must be in Field View or Memo View to copy selected text.

When using a form, you can copy values from any field type to a non-Paradox file format without using the Export command. In Field View or Memo View, you can copy selected text inside the field.

Paradox can copy graphic files only to the .BMP file format.

When you work with a binary field in a table, you can use Copy To to copy binary field values to a non-Paradox file format. The file extension you use is unrestricted.

To copy a field’s value to an external file

- 1 Click a field to select it
- 2 Click Edit, Copy To.

- 3 Type the filename (including full path if necessary) and extension in the File Name box.

Paradox creates a new file with the name you have specified and places the contents of the selected field in it.

Pasting from a file

You can use the Edit, Paste From command to paste values from non-Paradox files into Paradox fields and objects. You can paste text from .PXT, .TXT, and .RTF files into memo or formatted memo fields. If you're using a form, you can paste text into all field types except graphic and OLE.

To paste a value from an external file to a Paradox field

- 1 Click the field into which you want to paste the data.
- 2 Press F9 to enter Edit mode.
- 3 Click View, Memo View if you selected a memo or formatted memo field. Otherwise, go to step 4.
- 4 Click Edit, Paste From.
- 5 Type the filename (including full path if necessary) and extension in the File Name box or browse to find the file you want.
- 6 Click Open.

Paradox places the contents of the file in the selected field.



- You can use Edit, Insert Object to paste files into OLE fields and objects.

Spell checking your data

The writing tools can help you with spelling and correct word usage when you are editing forms or tables. You can use Spell Checker to check form or table fields for misspelled words and other writing errors, such as improper capitalization or duplicate words. When Spell Checker finds a misspelled word, you can replace it with the suggested word, edit the word manually, skip the word, or add it to the dictionary so that Spell Checker recognizes it as a valid word.

Customizing Spell Checker

You can customize the way that Spell Checker searches for misspelled words or irregular capitalization. For example, you can have Spell Checker beep

when it finds a possible spelling error. The options you enable remain effective for all spell checking sessions until you change them.

To check for spelling errors

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 When Spell Checker stops on a word, click any of the available options, or edit the word in the Replace With box.



- A table or form must be open in Edit Data mode (click View, Edit Data) and a field must be selected before Spell Checker can be launched.

To replace a misspelled word

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 When Spell Checker stops on a word and suggests replacements, choose the word you want from the Replacements list box.
- 4 Click Replace.



- If Spell Checker does not offer replacement words, click Skip, or edit text manually in the Replace With box.

To skip misspelled words

You can instruct Spell Checker to skip over one or all occurrences of a misspelled word in your forms and tables.

To skip a word once

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 When Spell Checker stops on a word, click Skip Once.

Use this feature when Spell Checker identifies an occurrence of a word that you don't want to change. Spell Checker skips the current occurrence, but it will flag any other occurrences of the same word.

To skip all occurrences of a word when you check the spelling

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 When Spell Checker stops on a word, click Skip All.
Spell Checker ignores the word for the rest of the spell-checking session.

To edit text manually during a spell-check

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 When Spell Checker stops on a word, click in the Replace With box and type changes to the text.
- 4 Click Replace in the Spell Checker window to continue.

Using custom Spell Checker options

You can set up Spell Checker to scan text for capitalization errors and words with numbers using the Options button.

To check for words that contain both letters and numbers

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 Click the Options button.
- 4 Enable the Check Words With Numbers option.
- 5 Click Start.
This option may not be available in all languages.

To check for irregular capitalization

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 Click the Options button.
- 4 Enable the Check irregular capitalization option.
- 5 Click Start.

Use this option to check for words with capital letters that do not begin a word (such as “THe”). This option may not be available in all languages.

To have Spell Checker beep on misspelled words

- 1 Click the field you want to check.
- 2 Click Tools, Spell Check.
- 3 Click the Options button.
- 4 Enable the Beep on misspelled option.
- 5 Click Start.

Choosing a Spell Checker language

Every language has specific ways of formatting dates, time, currency symbols, and other text. You can use the Language feature to check for the formatting conventions of another language.

For example, you can have Spell Checker format all the dates in your form or table in the language you choose (such as 12 avril 1996 for French).

You do not need an additional language module to check formatting conventions in another language. However, if you want to check the spelling or grammar of a field in another language, you must purchase an additional language module.

To choose a language

- 1 Click Tools, Spell Check.
- 2 Click Options, Language.
- 3 Choose a language from the list box and click OK.



- If you want this language to be the default language for Spell Checker, enable the Save As Default writing tools language option.
-

Adding Words to Spell Checker

When Spell Checker detects an unknown word such as a technical word or proper name, it treats it like a spelling error. You can add such a word to the dictionary so that Spell Checker will recognize it as a valid word.

To add words

- 1 Click Tools, Spell Check.

- 2 When Spell Checker stops on a word that you want to add to the dictionary, click Add.

Spell checker will no longer recognize the word as being misspelled.

Working with graphic data

Data in a graphic field can be any picture or graphic that is a scanned image, line art, or graphic file created in a paint or draw application.

Paradox gives you two ways to place a graphic in a field:

- using the Cut, Copy, and Paste commands
- using the Paste From command

To paste a graphic into a graphic field, you enter Edit mode and paste the graphic from the Clipboard or a file.



- You cannot edit a graphic in Paradox; you must edit it in its source application.
-

Placing a graphic using cut and paste or copy and paste

With Paradox, you can find a graphic in another application, cut or copy it to the Clipboard, and paste it into a Paradox graphic field.

To place a graphic in a graphic field from a Windows application that supports the Clipboard

- 1 Open the graphic file in its source application.
- 2 Select the graphic and cut or copy it to the Clipboard.
- 3 Open the Paradox table or form in which you want to place the graphic.
- 4 Press F9 to enter Edit mode.
- 5 Select the field into which you want to paste the graphic.
- 6 Click Edit, Paste.

Paradox places the graphic from the Clipboard into the graphic field.



- When you paste a graphic into a graphic field, Paradox converts the graphic into the .BMP file format.
-

Placing a graphic using Paste From

Paradox lets you place .BMP, .PCX, .TIF, .GIF, JPG or .EPS graphic files directly into a graphic field without opening the graphic's source application. Simply use the Edit, Paste From command.

To place a graphic in a graphic field without using the Clipboard

- 1 Click the field into which you want to place the graphic.
- 2 Press F9 to enter Edit mode.
- 3 Click Edit, Paste From.
- 4 In the Paste From Graphic File dialog box, choose the graphic file you want.
- 5 Click Open.

Paradox places the graphic in the graphic field.



- When you paste a graphic into a graphic field, Paradox converts the graphic into the .BMP file format.
-

Finding and replacing data

Use the Locate commands in the Record menu to find records, fields, and values in a table or form.

Paradox provides two ways to quickly change existing field values in Edit mode or Memo View:

- Use the Replace command to change the value of a field.
- Use the Find and Replace command to change a string within a memo field or text object.

You can use LIKE, NOT, EXACTLY, and other query operators to search for data using queries. You can also use a CHANGETO query to replace field values.

If you're working in the SQL Editor or IDE Editor, you can use Search, Find and Search, Replace to locate and replace text in SQL queries or ObjectPAL scripts.

Use the Locate commands on the Record menu in a table or run-time form window to find records and values in a table. You can include wildcards in a search.

Using wildcards to help you locate values

If you can't remember the exact spelling or syntax of the data you want to locate, you can use wildcards. Wildcards are operators that let you suggest patterns for Paradox to search. For more information, see "Wildcard characters" on page 164.

Locating a record number, field, or field value

You can use the Locate command to locate (and move to) a table record number, field, or value in a field. The record number of a Paradox table is assigned automatically by Paradox and cannot be edited. It shows the record's position in the table. When locating a value, Paradox moves to the first occurrence of the value that matches your search criteria. You can then use the Locate Next command to move to subsequent matches.

You must first open the appropriate table in order to locate a record, field, or value.

To locate a table record

- 1 Click Record, Locate, Record Number.
- 2 Type the record number.

To locate a field

- 1 Click Record, Locate, Field.
- 2 Choose the field name.

To locate a value in a field

- 1 Click Record, Locate, Value.
- 2 Choose the field name.
- 3 In the Value box, type the value you want to locate using any appropriate operators. You also have the option of enabling one of the following:
 - The Case-sensitive check box if you want Paradox to locate only matches that use the same capitalization as the value you typed.
 - The Exact Match button if you are not using wildcard symbols in your search.

- The “@ and ..” button if you are using either of those two wildcards in your search.
- The Advanced Pattern Match button if you are using any of the extended list of Paradox wildcards (other than “@ and ..”) in your search.

To locate the next record with the defined value

- Click Record, Locate Next to search for the next occurrence of the value you are searching for.



- You get improved performance if the field you use has an index, and that the Case setting matches the Locate operation.
-

Locating and replacing values in a field

With large amounts of data present in your database, finding particular pieces of information may seem a daunting prospect. However, Paradox allows you to locate and replace field values with little effort.

To locate and replace values in a field

- 1 Press F9 to change to Edit mode.
- 2 Click Record, Locate, Replace.
- 3 Choose the field you want to search.
- 4 In the Value box, type the value you want to locate using any appropriate operators.
- 5 Enter the replacement value in the Replace With box.
Paradox locates the first matching value.
- 6 You also have the option of enabling one of the following:
 - The Case-sensitive check box if you want Paradox to locate only matches that use the same capitalization as the value you typed.
 - The Exact Match button if you are not using wildcard symbols in your search.
 - The “@ and ..” button if you are using either of those two wildcards in your search.
 - The Advanced Pattern Match button if you are using any of the extended list of Paradox wildcards (other than “@ and ..”) in your search.

To skip that occurrence of the value and locate the next occurrence

- Enable the Skip This Occurrence button.

To replace that occurrence of the value and locate the next occurrence

- Enable the Change This Occurrence button.

To replace all occurrences of the value

- Enable the Change All Occurrences button.

Finding a particular record or value in a form or table

If you cannot recall which field contains the value you are seeking, Paradox gives you the option of searching by record number and value as well as by field. You can also specify a replacement value.

To find a particular record or value in a form or table

- Click Record, Locate, then choose one of the following from the submenu:

Command	Action
Field	Move to the field you specify. (This command is available only for tables.)
Record number	Move to the record number you specify.
Value	Move to a field value you specify.
Replace	Replace the specified value with another value you specify.

To search for more occurrences of an item

- Click Record, Locate Next.

Finding and replacing text in memo fields and text objects

A memo field can be very large. With Paradox, you can find and replace text in memo fields and text objects when you have a table or form open.

To find and replace text in a memo field, formatted memo field, or text object

- 1 Press F9 to switch to Edit mode.
- 2 Click the appropriate memo field to select it.

- 3 Click View, Memo View.
- 4 Select the text you want to search.
- 5 Click Edit, Find And Replace.
- 6 Type the text you want to search for in the Search For box using appropriate wildcards.
- 7 Type the replacement text in the Replace With box.
- 8 You may also enable either of the following:
 - The Case-sensitive check box to search for the text exactly as you typed it, including capitalization.
 - The Advanced Pattern Match check box if you used any wildcards in your search.

Paradox finds the first occurrence of the text.

To replace that occurrence of the text

- Click Replace.

To replace all occurrences of the text

- Click Replace All.



- You can also use the Find and Replace dialog box on text objects in both the Form Design and Report Windows.
-

Wildcard characters

If you want to search a table but can't quite remember the data you are seeking, you can search by using patterns or wildcard characters. For example, say you want to find a customer named Elliott in your customer table but you can't remember exactly how the last name is spelled. It could be Elliott, Eliot, or Elliot. Paradox will allow you to specify the following search pattern: El..t.

Wildcard characters in sample search strings

Wildcards are useful when you want to find data but can't remember exactly what or where that data is. Here are some examples of wildcard characters in a search string and what they find when you enable the Advanced Pattern Match option when searching for data.

Search string	Locates
co@l	cool and coal, but not col
s..ch	search, scorch, and such
^ any	any only when it occurs at the start of a paragraph (when the Case-sensitive check box is disabled)
able\$	able only when it occurs at the end of a paragraph (and is not followed by a period)
(success)	success
[success]	Any s, u, c, or e
[^ success]	Any character except s, u, c, or e
a (an)	Either a or an ("an" is a group here)
hands?	hand and hands (hand with or without the s)
suc?es?	Sue when the Case-sensitive check box is disabled. The ? stands for one "c" or none at all, and one "s" or none at all.
suc*es*	success or Sue (when the Case-sensitive check box is disabled). The * stands for any number of c's or none at all, and any number of s's or none at all.
suc+es+	success only; the + stands for one or more c's and one or more s's
4\ ^ 2	4 ^ 2 (read "four squared"). Without the backslash, only paragraphs ending in 4 followed by a paragraph starting with 2 would be found.
apples\pears	apples\pears
apples\\pears	apples\pears



- You can use ?, *, or + if you are not sure how to spell success.

List of wildcards you can use to locate values

You can use an extended set of wildcards in a search string when you enable Advanced Pattern Match in the Find And Replace and Locate And Replace dialog boxes.

Wildcard	Represents
..	Any value
^	Beginning of field

\$	End of field
*	Match none or more of the expression before the *
+	Match one or more of the expression before the +
?	Match one or none of the expression before the ?
	Match either the characters before or after the vertical bar
[abc]	Match any of the characters contained within the brackets
[^ abc]	Match any characters not contained within the brackets
(abc)	A group (a series of literals)
\	Use the following wildcard operator as a regular character
\r	Carriage return
\n	Line feed
\t	Tab
\f	Form feed

For examples, see “Wildcard characters” on page 164.

Entering data using table lookups

The Table Lookup feature lets you refer to another table to look up the acceptable values for a field. This new table is called the Lookup Table. Once you know the correct value, you can enter it in the field or direct Paradox to fill in the value for you. Before Table Lookups can be used, you must define a table lookup on the field you will be entering values into. For information about defining and using a table lookup, see “Table Lookups” on page 69.

If you are entering data in a table and come across a field that uses a table lookup, you may be able to view the lookup table and choose an appropriate value (if the Help and View option was selected), or you may not (if the Fill Only option was selected). This keeps your values secure. An authorized user will know the correct value.

Locking records

Paradox automatically locks a record when you start editing it and removes the lock when you leave the record. A message appears in the Status Bar to inform you of these automatic locks. When you lock a record, other users can view it, but can't edit or delete it. Locking a record also prevents other users from placing a read or write lock on the table and from performing any operations that require a read or exclusive lock (such as restructuring the table). You can manually lock a record.

Locking and unlocking records

With Paradox, you can maintain data security by putting a lock on a record. You can unlock the record when you want it accessible to other users.

To manually lock a record

- 1 Open a table and press F9 to switch to Edit mode.
- 2 Select a table record.
- 3 Click Record, Lock.

The Status Bar tells you that the record is locked.

Paradox automatically unlocks a record when you move off of it or switch from Edit mode to View mode.

To unlock a record

- 1 Select a locked table record.
- 2 Click Record, Unlock.



- If you have manually locked a record, you will have to unlock the record to release the record for other users to be able to edit or delete the record. If you try to edit a record and discover that it has been locked by another user, you can look at the Status Bar to see the name of the user who has locked the record.



- You can also lock a record by selecting the record and pressing F5 or CTRL + L.

Posting a record without unlocking it

Paradox automatically saves (posts) any changes you make when you leave the record, but you can save your edits before you leave the record.

To post a record without unlocking it

- Click Record, Post/Keep Locked.



- Sometimes Paradox moves a record to a different location when you post it. This happens if the table is keyed and the new record is not in its correct location in the table. Paradox moves the record to its correct location. When you click Record, Post/Keep Locked, the moved record remains active, and Paradox updates your view of the table if necessary.
-



FORMS AND REPORTS

5

You can use forms and reports, also called design documents, to organize and present your data in a variety of formats. For example, you can create forms and reports that

- display one record at a time
- display multiple records at a time
- display only certain fields of a table
- contain design features, such as lines, boxes, graphics, shading, or special colors
- perform on-screen calculations

Forms and reports can also link tables, so that information stored in separate tables appears together.

The primary difference between forms and reports is that forms are also editing tools. They let you display and edit the data in your tables. Any change you make in a form is reflected in the corresponding table(s). For example, you can create forms that add data to several tables at once.

Reports are printing tools. They let you format and print your data. For example, you can use reports to create form letters, mailing labels, invoices, and presentations.

Creating forms and reports

Creating a form or report typically involves following general steps:

- 1 Creating a data model.
- 2 Creating a layout.
- 3 Placing design objects in a document.

Creating a form or report using the experts

You can use the Paradox Experts to create forms, reports, or mailing labels. Some functions of Paradox, such as creating mailing labels, are performed more easily using the experts. Other functions, such as performing a mail merge, require the use of experts.

To create a form using an expert

- 1 Click Tools, Experts.
- 2 Double-click the Form icon.
- 3 Follow the instructions in the Form expert.

To create a report using an expert

- 1 Click Tools, Experts.
- 2 Double-click the Report icon.
- 3 Follow the instructions in the Report expert.

To create mailing labels using an expert

- 1 Click Tools, Experts.
- 2 Double-click the Mailing Label icon.
- 3 Follow the instructions in the Label expert.



- If you want Paradox to run the Expert automatically whenever you create a new form or report, click Tools, Settings, Preferences to open the Preferences dialog box, click the Forms/Reports page, and enable the Always Use Expert option.
-

Creating data models

A data model is the graphical representation of the relationships between tables. Data Models provide a simple way of telling Paradox which tables' data to display and work with, and how these tables are linked.

Data models exist in two ways:

- As part of a form or report. When you create a form or report, you need to tell Paradox which tables to use and how the tables are linked (on which fields). When you create a data model for the purpose of creating a form or report, you use the Data Model Dialog box.
- As a separate file. You can create a data model separately, without creating a form or report. This type of data model is created in the Data Model Designer. You can create it for use at a later time. These data models are saved with a .DM extension.

A data model can be based on a single table, or on multiple tables. To use information on a form, report, or query from more than one table, you must create a multi-table data model. You can define relationships between the tables by linking them together.

Single-table data models

A data model based on only one table is a single table data model. This type of data model is used to create forms and reports where you only need the data from one table. However, if referential integrity has been declared between this table and a table which is not present in the data model, you may encounter problems if you attempt to edit the form's data in a manner which would violate this integrity.

Multi-table data models

A data model based on more than one table is a multi-table data model. When you place more than one table on a data model, one table is defined as the master table and can be linked to one or more detail tables. After you open the Data Model Designer or the Data Model dialog box, you can define the relationship between the tables. You can use the mouse to draw a line between the fields in the tables. Or, if the fields do not match, the Link Property dialog box appears and you can select the fields you want to link.

- If you have established referential integrity between the two tables you are linking, Paradox automatically creates the link when you draw the line between the two tables. If you do not have referential integrity between the tables you are linking, you need to create the link in the Link Property dialog box. The Link Property dialog box appears once you have attempted to link unmatched fields. For more information, see "Linking tables in a data model" on page 174.

Drawing a line from the first table to the second table makes the first table the master table and the second table the detail table. If you draw a line from the second table to the first table, the second table becomes the master table and the first table becomes the detail table. The arrow shows the direction of the link. The arrow always points to the detail table.

The type of relationship created between two tables depends on the matching of the detail table's indexes to the master table's file structure:

- A double-headed arrow indicates a multi-value relationship (one-to-many).
- A single-headed arrow indicates a single-value relationship (one-to-one or many-to-one).

Complex Data Models

Complex data models can include a combination of single-value relationships and multi-value relationships. You can keep linking tables in the existing data model until you have the data model you want. As long as you have identified indexes properly, you can build data models that are as complex as you need them to be. For information see “Indexes” on page 58 and “Defining key fields” on page 56.

You might prefer to link the tables as you add them to the data model, rather than adding them all and then linking. This way, you can avoid scrolling the data model panel to view all the tables. For information see “Creating a link” on page 176.

Data Models for reports with groups

When creating data models for reports with group bands, you might want to consider linking the tables backwards, from detail table to master table, rather than in the conventional way of master table to detail table. This gives you more choices of fields to group by when adding a group band to the report.

Suppose, you create a report based on a data model using the tables Customer, Orders, and Lineitem. If you connect these tables in the usual way, Customer → Orders → Lineitem (creating a multi-value relationship), when you add a group band to the report, the Define Group dialog box makes available only the fields from the Customer table as choices for the Group By Field Value.

Creating and opening a data model

Paradox provides two methods to create data models. When you want to open or create a data model, you do so in either the Data Model dialog box or the Data Model Designer. The Data Model dialog box and the Data Model Designer allow you to do similar things. The main difference is that when

you are creating a data model in conjunction with a form or report, you open the Data Model dialog box; when creating a data model separately or from scratch, you open the Data Model Designer. It is recommended that if you are opening a data model not attached to any specific form or report, you do so in the Data Model Designer.

You can use the Data Model Designer or the Data Model dialog box to

- modify the data model of a design document
- display an independent data model, or (in the Data Model dialog box only) display the data model of the active form or report

In addition to the above, the Data Model Designer allows you to

- create a data model without creating a form, report, or query
- print data models

Creating a data model in the Data Model dialog box

You can use the Data Model dialog box to create data models based on tables, queries, or previously created data models.

When you place a query in the data model panel of the Data Model dialog box, Paradox creates the form or report based on the query. Instead of running a query and building a design from the resulting Answer table, you create the design based on the query itself. When you run a form or report based on a query, Paradox runs the query, then displays or prints the document.

To create a data model based on table(s)

- 1 Open the Data Model dialog box, click Format, Data Model.
- 2 Choose Tables from the list box.
- 3 Double click the table(s) to the workspace.
- 4 Drag the tables to arrange them on the workspace.
- 5 Link the tables by dragging one record from master table to the details table. For information, “Creating a link” on page 176.
- 6 To save the data model, click OK.
- 7 To save the data model to the Data Model Designer, click save DM.

To create a design document based on a query

- 1 Open the Data Model dialog box, click Format, Data Model.
- 2 Choose Queries from the Type list box.

3 Double click the queries to the workspace.

4 To save, click OK.

A query must be the master table in a multi-table design.



- Tables are placed on the workspace stacked one on top of the other, you can arrange the tables to suit your needs. When you save the data model, the layout of the tables is saved.
-

Creating a data model in the Data Model Designer

You can use the Data Model Designer to create and save a data model independently of other database objects. You can then use this data model as a basis for database design, including form and report layout.

To create a data model based on table(s)

- 1 Open the Data Model Designer, click File, New, Data Model.
- 2 Choose Table from the list box at the bottom of the Add Object dialog box.
- 3 Select a table from the list and click Add.
- 4 Drag the tables to arrange them on the workspace.
- 5 Link the tables just as you would using the Data Model dialog box. For information, see “Creating a link” on page 176.
- 6 Click File, Save or File, Save As.
- 7 Type a name for the data model in the File Name box.



- When you save the data model, the layout of the tables is saved.
-

Linking tables in a data model

Links allow you to relate the data from two or more tables in a design document.

To understand how Paradox links tables in forms and reports you must first understand how Paradox sorts and locates data based on the indexes (keys and secondary indexes) you specify. For information see “Defining key fields” on page 56 and “Indexes” on page 58.

You create links on common fields. For example, the Customer table has a Customer No field and the Orders table has a Customer No field, so you can

link these two tables on that field. In Paradox tables, the field name does not have to be the same in both tables, but the field type and size must match.

For example, suppose you are creating a data model that uses the sample Customer and Orders tables. Both tables have a Customer No field. The Customer No field in the Orders table contains values that represent records in the Customer table. It's easier and more efficient to keep order and customer information in separate tables. But sometimes you need to see data from both tables at once. That's when you need to link the two tables. When you link Customer and Orders, Paradox looks at each value in the Customer No field of Customer and, using indexes, finds matching values in the Customer No field of Orders. This way, you can tell which customer made each order.

Paradox uses an index to remember where values are. When you create a secondary index on a field, Paradox looks at each value in the field and creates a file that notes each value's location (record number) in the table. The index enables Paradox to locate records quickly and easily. If you create a maintained index, Paradox updates the index file every time you update the table.

When you link two tables, Paradox evaluates a value in the table you are linking from (the master table) and finds all matching values in the table to which you are linking (the detail table). Therefore, the detail table must be indexed on the field on which you want to link. The detail table can have either a primary index (key) or maintained secondary index on the linking field.

For example, you can link the Customer table to the Orders table on the Customer No field if you have an index on that field in the detail table. This would be a one-to-many link, because for every customer record you could have zero or more corresponding records in the Orders table. Or, you can link the Orders table to the Customer table on the Customer No field (the primary index of the Customer table). This would be a many-to-one link, because for every order there is one and only one corresponding record in the Customer table.

Types of links

You can link tables through either:

- Single-value relationships (one-to-one or many-to-one)
- Multi-value relationships (one-to-many)



- When you create a database, all the tables should be saved in the same directory, including lookup tables. Although the Data Model allows you to move from alias to alias, you should not link tables from two different

databases or create a lookup between tables from different databases. The concept of a relational database is one where only tables within the same directory are linked.

- In dBASE tables, you can link only on like field types, unless you use an expression index in the link.
-

Understanding links and indexes

Single-value relationships

A single-value relationship exists between tables if, for every record in one table, there are no related records or only one record in the other table to which it is related. For example, the relationship between the sample Lineitem and Stock tables is single-value: each line item ordered (each unique value in Lineitem) is one item of stock (a unique value in Stock).

When tables in Paradox have a single-value link, Paradox treats the fields in both tables much as if they came from the same table. You can group on tables joined by a single-value relationship. They can be displayed in the same table object or multi-record object.

In a many-to-one relationship, many records in the master table are related to one value in the detail table. For example, the Lineitem table lists specific items that a customer orders. Several items can be ordered at the same time, so many Lineitem records can point to the same Orders value.

Multi-value relationships

A multi-value relationship exists between tables if, for every record in the master table, no records, one record, or more than one record from another table is related to it. For example, one customer (one record in the sample Customer table) can place no orders, one order, or many orders (records in the sample Orders table). Therefore, each record in the Customer table can have many records in the Orders table that match it.



- Two tables containing identical key fields have a one-to-one relationship. When this condition exists, it is wise to combine these tables into a single table.
-

Creating a link

You can link tables while creating either a design document or a data model. Linking tables adds information from the tables to your design document.

To link two Paradox tables

- 1 Open the Data Model Designer or the Data Model dialog box.
- 2 Click the master table and drag a field to the detail table.

In some cases, Paradox creates the link immediately. Paradox does this if referential integrity exists between the two tables. You can click OK to accept this link. If referential integrity does not exist, you need to define the link using the Link Property dialog box.
- 3 To define the link, right-click and choose Link Property. If you attempt to link fields which do not have a previously established link, the Link Property dialog box will appear.
- 4 Click the add or remove buttons to select the master table field (parent field) that matches the selected Child Index.
- 5 Click OK to accept the link and return to the Data Model dialog box or Data Model Designer.



- You cannot create a link using BLOB, bytes, or logical fields because you cannot create an index on these field types.
-

Defining or removing a link

In the Define Link dialog box, Paradox shows all fields from the master table in the Field list.

To define a link

- 1 Open a data model.
- 2 Drag the field on which you want to link the details table to the master table.
 - If Paradox finds an index of the detail table that matches the name and type of the field you've chosen, Paradox completes the link for you.
 - If no name and type match is found, the Link Property dialog box is opened and Paradox uses the first index of the detail table that matches in type and length if applicable. You can choose another index to replace the automatic choice.
- 3 Select the index you want to use for the detail table from the Index list.

- If you're using a composite key or index on the detail table, select fields from the master table to match some or all of the fields in the index.
- If you use a composite key or index and match all its fields, Paradox creates a one-to-one link. Otherwise, Paradox creates a one-to-many link.

To remove an existing link between tables in a data model

- 1 Right-click the link.
- 2 Click Unlink.

Modifying a link

After you choose a matching field from the master table and an index from the detail table in the Link Property dialog box, Paradox creates a link between the two.

To link tables using a different field or index

- 1 In the Data Model Designer or Data Model dialog box, click the arrow, right-click Unlink.
- 2 Drag a field or index from the master to the detail table.

The data model shows what type of link exists between the tables.

- Two tables linked with a double-headed arrow have a multi-value relationship. The direction of the arrow shows the direction of the link (master-to-detail).
- Tables linked with a single-headed arrow have a single-value relationship.

Adding or Removing a table from a data model

You can add or remove tables in either your current data model in a form or report, or in a saved data model. When working in a form or report, use the Data Model dialog box. The changes are reflected in your current form or report immediately. You can make changes to a saved data model in the Data Model Designer to use independently of a specific design document.

To add a table to a data model in the Data Model Designer

- 1 Click File, Open, Data Model.
- 2 Select a data model file and click the Open button.

- 3 Click Edit, Add Object.
- 4 Double click the table(s) you want to add or select a table and click the Add button, then click OK.

To add a table to a data model in the Data Model dialog box

- 1 Open the Data Model dialog box, Format, Data Model.
- 2 Double click the table(s) you want to add.

To remove a table from the data model

- In the Data Model Dialog box or Data Model Designer, right-click the table, and choose Remove Table.



- Master tables cannot be deleted from the data model. You must first unlink them.
-

Viewing data models

Data models can be viewed attached to the currently active form or report, as well as data models that are not attached to any particular document. Data models may be viewed either in the Data Model Designer or in the Data Model dialog box.

Viewing a data model

You can view a data model in the Data Model Designer, or as part of an active form or report.

To view a data model in the Data Model Designer

- 1 Click Open, Data Model.
- 2 Select the data model you want to view from the Select File dialog box.
- 3 Click the Open button.

To view the data model of an active form or report.

- Click Format, Data Model.



- The tables appear in tile formation in both the Data Model Designer and the Data Model dialog box. You can arrange the tables by dragging each one individually. When you save the data model, the layout of the tables is saved as well.

Viewing table properties in the Data Model dialog box

If you are designing a form or report, you can view a table's name and its field names. You can also display or modify the following properties for forms: table alias, read-only, strict-translation, and auto-append. For both forms and reports, you can display and modify the filter property.

Table Alias

Opens a Table Name dialog box where you can specify a table alias for a table in a data model.

Filter

Opens the Filter Tables dialog box, where you can set a filter for the table to view only the data that meets your specifications.

Read-Only

Protects the table from being edited in this form. You can still edit the table in other documents or in its Table window.

Strict Translation

This property restricts the characters that you can input into a table to those which are actually in the character set of the table's language driver. Strict translation is enabled by default.

Auto-Append

Automatically creates a new, blank record whenever you move beyond the last record in the table. Auto-append is enabled by default.

To view table properties in the Data Model dialog box

- 1 Open a form in the Design Window.
- 2 Click Format, Data Model.
- 3 Right-click the table in the panel.
- 4 Choose a property



- When you save a data model, Paradox saves the properties you've specified for each table in the data model. You can save the same data model with different properties to suit all your needs.

Using table aliases

You can assign a different name, called an alias, to a table. Table aliases can provide the following benefits:

- If you use the same table more than once in a data model, table aliases help you avoid confusion.
- A form or report is more portable when you use table aliases.
- You can change table aliases to conform to the naming conventions of your SQL server when you upsize your application.
- You can refer to tables in ObjectPAL code using table aliases. This means you can change the table your code refers to without breaking the code or requiring table name modifications.

You can use table aliases instead of table names when you create calculated fields. If you need to change tables, you can keep the calculated field expressions by assigning the table alias to the new table.

Creating or removing a table alias

A table alias must contain an alpha character as its first character, cannot contain spaces, and can be up to 32 characters in length.

To create a table alias

- 1 Right-click the table in the Data Model dialog box or Data Model Designer, and click Table Alias.
- 2 Type an alias for the table in the Table Name dialog box.

To Remove a table alias

- 1 Right-click the table in the Data Model dialog box or Data Model Designer, and click Table Alias.
- 2 Delete the table alias in the Table Name dialog box.



- You can only add or remove a table alias in Design Mode.

Saving and printing a data model

Paradox lets you save or print your data model, whether it is a stand alone document, or is linked to the active form or report. In the Data Model dialog box you can save the data model for the active form or report, or you can save a data model separately in the Data Model Designer. If you want to use a previously created data model, you can modify it and save the modified data model under a different name.

Applying or canceling changes to the data model of the active form or report

While designing a form or report, you can change your data model — including adding or removing tables, and creating or removing links between tables. You can choose to apply these changes to your data model, or to remove them if they do not suit your needs.

To apply changes to the data model of the active form or report

- In the Data Model dialog box or Data Model Designer, click OK.

To cancel changes to the data model of a form or report

- In the Data Model dialog box or Data Model Designer, click Cancel.

Saving changes to the Data Model Designer

You can make changes to the Data Model Designer and modify the current data model or save it under a new name to use separate from a specific form or report.

To save the data model with its current name

- In the Data Model Designer, click File, Save.

To rename a data model

- 1 In the Data Model Designer, click File, Save As.
- 2 Type a name for the data model in the File Name box.

Paradox saves the data model with the .DM file extension.

Printing a data model

You can only print a data model in the Data Model Designer. To print a data model attached to a form or report, save the data model with a .DM

extension in the Data Model dialog box and print it from the Data Model Designer.

To print a data model in the Data Model Designer

- Click File, Print.



- Right-click and choose Print Preview to view the current data model before printing.
-

Laying out forms and reports

When you create a form or report layout, you specify the style of the master and detail records and which fields you want to display in the document. You then choose a style sheet to establish the default properties of design objects.

You use the Design Layout dialog box to create and modify your layouts. This dialog box has different options for linked-table documents and unlinked-table documents. The document's data model determines which Design Layout dialog box is displayed. Most options available for design layouts are the same for forms and reports. The only differences are the way the preview image is displayed and the choice of style sheets.

Reports

Reports use bands to separate different areas of the layout. Reports have bands for report headers and footers, page headers and footers, groups that sort the data, and the body of the report.

The Design Layout dialog box shows report bands when you preview a report layout. Paradox places the contents of your report's data model within the record band.

Forms

Forms don't use bands; therefore, the preview area in the Design Layout dialog box for a form is blank except for the contents of your form's data model.

Specifying an initial layout

There are two main options when creating a design document: single-record layouts and multi-record layouts. Table layout is a multi-record layout where the data appears in tabular form rather than in groups of fields sorted by the key field.

Understanding single-record objects

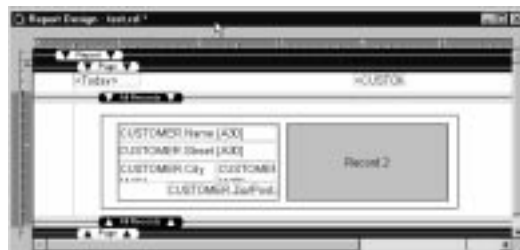
A single-record object displays one record at a time, meaning that each page of your form or report only contains the data from one row or record of the table on which it is based. This format is convenient when the table in your data model has records with large amounts of information (such as a memo field) or has a physically large field (such as an OLE or graphic).

Understanding multi-record objects

A multi-record object displays several records at a time by using a field layout that repeats a specified number of times horizontally and vertically on the page. You can place fields in any pattern. You define the field layout for one record and then specify how many records across and down you want.

A common use of a multi-record object is to create mailing labels. Each label is a group of fields (such as Name, Address, City, State, and Zip) in a layout, repeated for each record. The following figure shows the design for a multi-record report that uses fields from the sample Customer table.

- In the master record region, define the field objects and arrange them in the layout you want.
- The gray record regions show where Paradox will place additional records.



When you print or preview this report, Paradox repeats the pattern of the fields in the master record region for every record in the Customer table.



- The record object inside the multi-record object is a container for the records. If you make the record object too small, Paradox will eliminate fields in the Define Multi-record Object dialog box (right-click menu) to make the record fit the container. To resize the records, select the master record region and drag any of its selection handles. Because all record regions in the multi-record object are the same size, Paradox resizes the gray repeating regions along with the master record region.

Opening the Design Layout dialog box

The first step when you specify the initial layout for a form or report is to open the Design Layout dialog box. You cannot open the Design Layout dialog box until you create a data model for the form or report. The Design Layout dialog box is an excellent aid to laying out your design, but it is only a starting point. You can change the design in a Design Window after you close the Design Layout dialog box.

To open the Design Layout dialog box from the Data Model dialog box

- 1 Click File, New, Form or Report.
- 2 Click the Data Model button.
- 3 Use the Data Model dialog box to create the data model.

When you click OK, Paradox opens the Design Layout dialog box.

To open the Design Layout dialog box from a blank form or report

- 1 Click File, New, Form or Report.
- 2 Click the Blank button to open a blank form or report.
- 3 Click Format, Data Model.
- 4 Select Data Models from the list box at the bottom of the Table Palette.
- 5 Double click a data model.
- 6 Click OK.
- 7 Click Format, Layout.

To return to the Design Layout dialog box from a Design Window

- Click Format, Layout.



- Depending on the options selected in the Forms/Reports page of the Preferences dialog box (Tools, Settings menu), you might not see the New Form or New Report dialog box when you click File, New. Depending on your preference setting, you might see the Data Model dialog box automatically, or you might open an Expert or a blank document.
-

Choosing a layout style

You specify the initial layout from the Design Layout dialog box, and then refine the layout in the Design Window. If you're working with a multi-table design, the layout style you choose is for the master table.

To choose a layout style

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 In the Design Layout dialog box, enable one of the following buttons:
 - Single-Record—displays one record of the table at a time in a free-form layout.
 - Tabular—displays rows and columns as if you were working with the table itself.
 - Multi-Record—displays several records of the table at a time.
 - Blank—removes all fields from the design.

Selecting fields to display

When you create a design document, Paradox includes all fields from all the tables you link to the master table of the document (except for a duplicated field between a linked master and detail table, which is shown only once in the master table).

You can select which fields to display by using the Fields page of the Design Layout dialog box.

To remove a field from the design

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 In the Design Layout dialog box, click the Fields page.
- 4 Choose the appropriate table from the Table list box.
- 5 Select the field you want to remove from the Selected Fields list.
- 6 Click Remove Field.

To change the order of fields in the design

- 1 Follow steps 1 to 4 of the preceding procedure.

- 2 Select the field whose position you want to change.
- 3 Click the Up arrow to move fields up the list, or click the Down arrow to move fields down the list.

To reset fields

- Click the Reset Fields button on the Fields page of the Design Layout dialog box.

Paradox redisplayes all removed fields.



- All changes you make in the Design Layout dialog box can be modified in a Design Window. You can replace removed fields in the Design Window with the Field tool.
 - Paradox only displays fields from the master table and tables you linked to it in the Design Layout dialog box. You can add fields from unlinked tables to your design in the Design Window by using the Field tool.
 - For reports, Paradox also adds fields for the date, the page number, and the title. You cannot remove these fields in the Design Layout dialog box; you must remove them in the Report Design Window.
-

Displaying fields in columns or rows

For single-record or multi-record layouts, you can display fields in columns or by rows.

To display fields in columns or rows

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 In the Design Layout dialog box, enable one of the following buttons:
 - Single-Record—displays one record of the table at a time in a free-form layout.
 - Multi-Record—displays several records at a time.

4 Enable one of the following buttons:

- By Columns—displays fields in a top-to-bottom column along the left side of the screen. Paradox creates columns as needed until all fields are displayed, and creates additional page images if necessary.
- The By Rows—displays fields one after another in a row along the top of the screen. Paradox creates additional rows as needed until all fields are displayed, and creates additional page images if necessary.

Hiding or showing field labels

You can specify whether or not your forms or reports have field labels. A field label is a text object that contains the field name.

To hide or show field labels

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 Enable or Disable the Label Fields check box to hide field labels.



- This option is unavailable in a tabular design.
-



- In the Design Layout dialog box, you specify how you want the fields to be displayed by default. In a Design Window, you can right-click individual fields to turn the display of field labels on or off.
-

Using style sheets

Style sheets give your forms and reports a consistent appearance. You can create a style sheet to set the color, size, and style of all of the design objects, such as buttons, boxes, and fields that you use to create forms and reports. You can also choose one of the many style sheets included with Paradox.

You can choose a style sheet using the Design Layout dialog box.

To choose a style sheet

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.

- 3 In the Design Layout dialog box, choose a style sheet from the Style Sheet list box.

Paradox provides several style sheets, but you can also create your own style sheets. If you have created a form or report with features you wish to use for future documents, you can save those features as a style sheet.

To save a created style sheet

- 1 Click Format, Style Sheet.
- 2 Enter the name and the path of the style sheet you want to save.
 - If your style sheet is designed for the screen it should have an extension of .FT
 - If your style sheet is designed for the printer it should have an extension of .FP
- 3 Click Save.

Multi-table layouts

When you have more than one table in your data model you require a multi-table layout. Paradox allows you to display the information from your tables in tabular or field format, and gives you several options for how the tables and/or fields should be laid out. You also have the option of nesting the records, that is placing the detail records inside the multi-record object.

Displaying objects in columns or rows

When working with multi-table design layouts, you can display objects (whether they are fields, tables, or multi-record objects) either as columns or as rows .

To display objects in columns or rows (multi-table design)

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 In the Design Layout dialog box, enable one of the following buttons:
 - Single-Record—displays one record of the table at a time in a free-form layout.
 - Multi-Record—displays several records at a time.

- 4 Enable one of the following buttons:
 - By Columns—displays fields in a top-to-bottom column along the left side of the screen. Paradox creates columns as needed until all fields are displayed, and creates additional page images if necessary.
 - By Rows—displays fields in a left-to-right row along the top of the screen. Paradox creates rows as needed until all fields are displayed, and creates additional page images if necessary.

Displaying master and detail records

You specify the style used to display master and detail records in the Design Layout dialog box, then refine the layout in the Design Window. The default placement for detail records is before the associated master records. In a multi-table design, you can place master records before unnested detail tables.

To display several master records at the same time

- 1 Open a form or report in the Design Window.
- 2 Click Format, Layout.
- 3 Enable either Tabular or Multi-record to display more than one record at a time from the master table.

To show detail tables

- 1 Open a form or report which is made up of a one-to-many relationship data model in the Design Window.
- 2 Click Format, Layout.
- 3 Click the Detail Tables page.
- 4 Enable one of the following buttons:
 - Table—displays detail tables in rows and columns as if you were working with the table itself.
 - Record—displays several records at a time.
- 5 If you enabled Record in step 4, enable one of the following buttons:
 - Horizontal—displays multiple records across the page.
 - Vertical—displays multiple records down the page.
 - Both—displays multiple records across and down the page.

To place master records before detail tables

- 1 Open a form or report which is made up of a one-to-many relationship in the Design Window.
- 2 Click Format, Layout.
- 3 Enable Single record.
- 4 Enable the Fields Before Tables check box to display master records before any related detail tables.



- In a form, master records can be displayed in either the tabular style or the multi-record style. Detail records can be either nested in the master multi-record object or separate from either a master table or multi-record object.
- In a report, the master records are always displayed in the multi-record style, and the detail records can be displayed in either a table or a multi-record object nested in the master multi-record object.
- The Details tab is only available when the form or report is made up of a one-to-many relationship.

Nesting detail records

In a one-to-many form design, you can display master records in a multi-record object and place detail records inside that multi-record object. This is called nesting detail records within the master. The detail tables are displayed in a multi-record object or a table, depending on the option you enable on the Detail Tables page of the Design Layout dialog box. If you are creating a report from a multi-record object form design, the detail records must be nested.

When you design a report layout, Paradox automatically nests detail objects within master objects whenever you display several master records. Because nesting is automatic and required, the Nested option does not appear in the multi-table Design Layout dialog box for a multi-table report.

Try to structure your report design so that a record appears on a single page. If you have many detail records for each master record, or many levels of nesting, you should make sure that all detail records will fit on a single page before running the report. You can do this by limiting the size or number of detail records.

To nest detail records in a form

- 1 Open a form or report which contains a one-to-many relationship in the Design Window.
- 2 Click Format, Layout.
- 3 Enable Multi-record to display more than one record at a time from the master table.
- 4 Enable the Nested check box.

To limit the size or number of detail records in a report

- 1 Open a report in the Design Window.
- 2 Right-click the table or multi-record object that contains the detail records and click Properties.
- 3 Click the Run Time page.
- 4 Disable the Show All Records check box.
- 5 Click View, View Data to run the form and notice that you don't see all the data.
- 6 On the Run Time page of the Properties dialog box, enable the Show All Records check box.

Run the form. This time the detail table expands to include all the data.

Using the form and report design window

Use the Design Window to create or modify the design of a form or report. The Form and Report Design Windows are the same, except that you use one to create and modify forms; you use the other to create and modify reports. To help you create your desired form or report, use the following:

- Design Window toolbar to place tools on a form or report.
- Design Window ruler to place, resize, or move design objects.
- Design Window grid to align the placement of design objects.
- Set designer preferences to establish the behavior and display of the Design Window.
- Style sheets to set a consistent appearance for multiple forms or reports.
- Set default Design Window preferences to create a default design window when creating new forms and reports.

Design Window toolbars

The Toolbar in a Form Design or Report Design Window contains design tools that you use to place design objects on a form or report. The name of each tool appears as a tool tip.

You can use the design tools on the toolbar to create a single object, or, you can keep the tool active and create multiple objects of the same kind.

For details about design objects, see “Using design objects in forms and reports” on page 206.

Using the Design Window toolbars

You can select which toolbars you want displayed while you are working, allowing you to customize your workspace. The tools on the toolbars can be used to create design objects of almost any size, shape, or function.

To display a Toolbar

Enable one of the following:

- Click View, Toolbars and enable the Toolbars you want to display.
- Right-click the empty area on any Toolbar and enable the Toolbars you want to display.

To create an object on a form or report using the Toolbar design tools

- 1 To create a single object of any type, click the tool you want.
- 2 Do one of the following:
 - Click the design to place the object at its default size.
 - Click the design and drag to place the object and specify its size.
 - Press SHIFT, and click in the design and drag to constrain the object.



- When you constrain a box, it becomes a square; an ellipse becomes a circle; a line is forced to be horizontal, vertical, or at a 45-degree angle; all other objects (buttons, fields) become square.



- To create more than one object of the same type, hold down SHIFT while you click the tool you want. The tool remains active until you click the selection arrow or another tool.
-

Changing a tool's properties

You can change the default properties of any design tool on the Toolbar. Changes you make using Copy To Toolbar last only for the current session. To make permanent changes to design tools, save the design as a style sheet.

To change a tool's properties

- 1 Place the object on the design document.
- 2 Right-click the object and click Properties.
- 3 Use the Properties dialog box to change any of the tool properties.
- 4 With the Properties dialog box still open, right-click the object again and click Copy To Toolbar.

The properties you set for the object are copied to its tool on the Toolbar. These properties are used as defaults for any subsequent objects created with that tool.

To save a new style sheet

- Click Format, Style Sheet and save the current style sheet as a new style sheet.

Copying page or design object properties to the Toolbar

You can change the form's page properties, such as color or pattern, and copy them to the Toolbar. Paradox saves page properties the same way it saves design-tool properties. Every time you create a new form, it will have the same properties as those you saved.

You can change the properties of individual components of a composite design object. For example, you can change the properties of a field that is contained by a table frame, then copy the table frame to the Toolbar. All fields in table frames you subsequently place will have the properties that you set.

When you copy composite design objects to the Toolbar, you can customize the following components:

- table frames — headers, records, and fields
- multi-record objects — record and fields
- fields — edit region and text label
- crosstabs — text labels, fields, and cell regions
- buttons — text labels

To copy a composite design object's properties to the Toolbar

- 1 Click the design object to select it.
- 2 Right-click the object and click Copy To Toolbar.

To copy page properties to the Toolbar

- 1 Click the background of the page to select the page.
- 2 Right-click the page (anywhere in the background), and click Properties.
- 3 Click Edit, Copy To Toolbar.
- 4 To make the changes permanent, save the design to a style sheet: right-click the Design Window Title Bar, click Style Sheet, and save the current style sheet as a new style sheet.

Design Window rulers

Both the Form Design and Report Design Windows have horizontal and vertical rulers you can use to place, resize, or move design objects. They also have an expanded ruler (used in combination with the horizontal ruler) you can use to edit and format text objects.

When you select a design object, the rulers change color to indicate the object's placement and size.

Using the Design Window rulers

After you set preferences, every time you open a new form or report, the default rulers are displayed. You can override these settings for the current document after you are in a form or report.

To display rulers

- With a form or report open in the Design Window, click View, Ruler to place a check mark beside the option.

This menu option toggles between show and hide.

To set default rulers and their grid settings for all design documents

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Enable or disable options as appropriate.

For a complete explanation of the available options, click Help.

To override the default ruler-display for the current document

- With a form or report selected in the Design Window, click Format, Design Setup and enable the rulers you want to display.

This change only affects the current document.

To change the grid settings to set the units of measure for both the grid and the rulers

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Do one or more of the following:
 - To choose the unit of measure, choose Inches or Centimeters from the Units list box.
 - Type a number in the Major Division box to specify the spacing between major grid lines (in the specified unit of measure).
 - Type a number in the Minor Division box to specify the number of tick marks, or minor divisions between major grid lines.



- You can also display rulers when you run a form. Click Format, Design Setup and enable the check box beside each ruler you want to display. To display the enabled rulers, click View, Rulers so that a check mark appears beside the option.
 - You can override grid settings for the current document by clicking Format, Design Setup and changing the settings as appropriate.
-

Using the expanded ruler

The expanded ruler, used in conjunction with the horizontal ruler, is an editing and layout tool for use with a text object. Use it to adjust margins, tabs, line spacing, and text alignment. The expanded ruler applies to only one text object at a time. It is displayed regardless of the object selected, but the tab, indent, and margin markers appear only when you place an insertion point in a text object (not when you select the object as a whole). The tab, indent, and margin markers apply only to the text object in which you are working.

Selecting text for formatting

- When you select the entire text object, the expanded ruler's settings apply to all the text within it.

- When you select specific text and change the settings, the changes apply only to the selected text (except for spacing and alignment settings, which always apply to all the text within a paragraph).
- When you position the insertion point in the text object without selecting any text, changes to that paragraph take effect.

To display the expanded ruler

- 1 Click Format, Design Setup.
- 2 Enable the Expanded Ruler check box.
- 3 In the Design Window, click View, Ruler so that a check mark appears beside the option.

To specify which rulers display by default in the Design Window

- Click Tools, Settings, Preferences. On the Designer page, enable the rulers you want to display each time you open the Design Window. Horizontal Ruler is enabled by default.

Using the buttons on the expanded ruler to lay out text in a text object, you can adjust alignment, tabs, and line spacing.



- For text formatting, you can also use a special Text Formatting Toolbar. To display this Toolbar, click View, Toolbars, and enable the Text Formatting Toolbar. You can also right-click the Toolbar and enable Text Formatting.

Placing tabs

If you don't place any tabs, Paradox uses default tab settings to place tabs that you can't move or delete. When you place a tab, all default tabs to its left are removed. To delete all default tabs, place a tab near the right margin. You can move and delete the tabs you place. If you delete all the tabs you place, Paradox returns to its default tab settings.

Tabs can be set on the horizontal ruler, but to change the type of tab, you need to use the expanded ruler. Default tabs in the ruler and expanded ruler are a half inch apart.

The following types of tabs are available:



Left: Text following the tab is pushed right so that its left edge lines up under the tab marker. This is the most typical tab type.



Right: Text following the tab is pushed left so that its right edge lines up under the tab marker.



Center: Text following the tab is centered under the tab marker.



Decimal: Decimal points line up under the tab marker. Use a decimal tab to align columns of figures at the decimal point.

To add a tab marker

- 1 Place a text object on a form or report in the Design Window and turn on the expanded ruler.
- 2 Click View, Ruler.
- 3 Click inside the text object. The insertion point must be in a text object.
- 4 Click a Tab button on the expanded ruler.
- 5 Click the tab well to place the tab marker.

To move a tab

- Drag it to a new location.

To delete a tab

- Drag it away from the ruler.



- To display the expanded ruler, enable the Expanded Ruler check box on the Design Setup dialog box.

Adding indentations

Use indent markers in the ruler or expanded ruler to place indents and create hanging paragraphs in the selected text object.

To place an indent

- From inside a text object, drag the indent marker in the tab well to the location you want.

When the indent marker is to the right of the margin marker, the paragraph is indented. When the indent marker is to the left of the margin marker, the paragraph is outdented.

To move an indent marker

- Drag the indent marker to a new location.

Changing margins and text alignment

Change margins for a text object in the ruler or expanded ruler. The default margins of your text are the left and right borders of the selected text object. Paradox establishes the default margins of text by the location of the text object. By default, text is aligned along the left edge of the object. You can align text at the left or right margin, down the center of the text object, or at both the left and right margins.

Use the alignment buttons in the expanded ruler to align text objects.

The alignment buttons are left, centered, right, and justified.

To change a margin



- Drag the *margin icon* to the tab well location you want.

To change text alignment

- Click the alignment button you want before you begin typing. If no text is selected, the next text you type will be aligned the way you chose. (You can also select the text and then click the appropriate alignment button.)

Changing vertical line spacing

Using the expanded ruler to change spacing is faster than changing an object's properties.

To change vertical line spacing



- Click the *line spacing* button for the selected text. Choose 1 for single-spaced text, 2 for double-spaced, and so on. The default spacing is single-spaced.

If no text is selected, the next text you type will be spaced the way you chose.

Using the Design Window grid

The grid is a background of horizontal and vertical lines that help you align the placement of design objects on the page. Paradox displays major grid lines and minor grid ticks. Lines show the grid's major divisions, and dots show the grid's minor divisions. Showing the grid helps you line things up by eye, or see where design objects are snapping if you have enabled the Snap To Grid property (Format menu).

The unit of measurement used by the grid is the same as the unit of measurement displayed in the ruler. For example, if metric measurements are used in the ruler, the grid increments are metric as well.

- **Units:** Choose inches or centimeters as the unit of measure.
- **Major Division:** Specify the distance (in the units chosen) between major grid lines.
- **Minor Division:** Specify the number of minor divisions (shown by tickmarks) between major grid lines.

To display the grid

- With a form or report open in the Design Window, click View, Grid so that a check mark appears beside the option.

Paradox displays major grid lines and minor grid ticks.

To change the scale or unit of measurement of the grid

- Click Tools, Settings, Preferences to set the default grid settings for all forms and reports.



- If the grid is visible in the Report Design Window, you can right-click a band and choose Move Grid To Band to reorient the grid at the top left corner of the band.
 - The grid does not have to be visible for you to use it.
-

Setting Designer preferences

The Designer preferences affect the behavior and display of Design Windows, and are common to both Form Design and Report Design Windows. These preferences can be set as defaults when you click Tools, Settings, Preferences, or changed as settings in the current Design Window. Preferences set become the default settings for both Design Windows. Each time you open the Form Design or Report Design Window, Paradox uses these settings.

The Designer page contains the following Design Window preferences:

- “Select From Inside” on page 201 specifies how to select design objects contained by other objects.
- “Frame Objects” on page 202 specifies whether to display design objects with or without frames.

- “Flicker-Free Draw” on page 202 suppresses screen flashes when you move or resize design objects.
- “Outlined Move/Resize” on page 203 specifies what you see when you move or resize a design object: the object itself or an outline of the object.
- Grid measurements specifies the unit of measure and the distance between major grid lines and minor tick marks between grid lines for a grid or a ruler.
- Ruler specifies which rulers to display in the Design Window.



- Changing the default Designer preferences has no effect on an open form or report. You must close the document, then re-open it to use the new default preference settings.
 - On the General page of the Preferences dialog box, you can activate or deactivate hyperlinks for fields on a form from a table. This is useful when you are designing forms and you do not wish to launch the Internet application.
-

Select From Inside

When you click an object that is contained by another object, the Select From Inside option on the Designer properties page specifies how Paradox selects the object.

Suppose you have an ellipse contained in a box. When you click the ellipse, what do you want selected — the box or the ellipse?

- If Select From Inside is disabled, Paradox selects the outermost object first. This means, even though you click inside, Paradox selects the outer object first. The second click selects the ellipse.
- Similarly, if a field is contained in an ellipse contained in a box, and you click the field, the first click selects the box, the second click selects the ellipse, and the third click selects the field.
- If Select From Inside is enabled, Paradox selects the object you click. For example, if you have a field contained in an ellipse contained in a box, you can click the field to select the field, click the ellipse to select the ellipse, and click the box to select the box.

To select a contained object on first click

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Enable the Select From Inside check box.



- Double-click an object contained by another object to select it immediately, regardless of whether Select From Inside is enabled.
 - When you have selected an object contained by another object, you can press ESC to select the next outermost object. For example, if you select an ellipse within a box, press ESC to select the box.
-

Frame Objects

You can display objects on your screen with or without frames by using the Frame Objects option on the Designer properties page.

To see objects on the screen with frames

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Enable the Frame Objects check box.

Flicker-Free Draw

Sometimes the screen flashes a bit when you move or resize objects. This is especially noticeable when your design has a dark background. To suppress this behavior, you can enable the Flicker-Free Draw option. Turning Flicker-Free Draw on eliminates some screen flickering, but it can cause the movement or resizing of objects to be slower. Experiment by turning the option on and off to see which works best for you.

To keep your screen from flickering when you resize or move objects.

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Enable the Flicker-Free Draw check box.

Outlined Move/Resize

You can specify how you want Paradox to display objects when you move or resize them. You can have Paradox display the object itself move, expand, or shrink as you move and resize it. Or, to move and resize objects faster, you can have Paradox display only the outline of the object as you move, expand, or shrink it.

To specify how you want Paradox to display objects as you move/resize them

- 1 Click Tools, Settings, Preferences.
- 2 Click the Designer page, and enable or disable the following check box:
 - Outlined Move/Resize—when enabled, displays an outline of an object as you move or resize, and displays the object itself as you move or resize it when disabled.

Setting default Design Window preferences

You can specify how Paradox creates new forms and reports, whether forms and reports open in Design Mode, the size of the form screen page, and the style sheet for the initial appearance of design objects. After selecting form and report default preferences, every form or report you open will use these settings.

To set form and report default preferences

- 1 Click Tools, Settings, Preferences.
- 2 In the Preferences dialog box, click the Forms/Reports page.
- 3 Enable preferences as appropriate. For an explanation of each option click Help in the dialog box.

Style sheets

If you are creating multiple forms and reports, you may want them have a consistent appearance. For example, you may want all text in the form to be green and all boxes to be blue. Instead of creating these objects and then modifying their properties manually each time you create a new form or report, you can use a style sheet that applies these properties as you create the objects.

Normally, if you change the properties of a design object, these properties remain as you've changed them until you exit Paradox. Style sheets allow you to save these changes so that you can create forms and reports with a consistent look.

Creating or saving a style sheet

Paradox provides several style sheets. You can also create and save your own style sheets.

To create or save a style sheet

- 1 Create your form or report, modifying the properties of the design tools where appropriate.
- 2 With a form or report open in the Design Window, click Format, Style Sheet.
- 3 In the Style Sheet dialog box, do one of the following:
 - To modify an existing style sheet, select that style sheet from the list and click Save.
 - To create a new style sheet, click Save As from the Save File As dialog box, and type the filename and path of the new style sheet in the File Name box.



- The extension of the style sheet (.FT or .FP) depends on whether your design document is designed for the screen (.FT) or for the printer (.FP).
-

Applying a style sheet

You can apply a style sheet to a form or report at any time. When you apply a style sheet, all changes you make to the form or report thereafter will conform to the style sheet. Objects already on the form or report retain their original properties. If you want to change previously created objects on your form or report to a new style, you have to change the style sheet in the Design Layout dialog box.

To apply a style sheet

- 1 Right-click the form or report title bar, and click Style Sheet.
- 2 In the Style Sheet dialog box, select a style sheet.

To change to a different style sheet

- 1 While in Design Mode, click Format, Layout.
- 2 In the Style Sheet list box, select a different style sheet.



- Changing to a different style sheet will replace the changes you have manually made to the form or report (such as adding design objects, or moving fields). Therefore it is better to change to a new style sheet before you have made any changes to the form or report.



- You can change the default style sheet using the Preferences command (Tools, Settings menu). Or, you can choose a different style sheet in the Design Layout dialog box.

Specifying a default style sheet

If you want all of your forms and reports to have a uniform look, you can set the default style sheet, which Paradox will use to create all forms and reports.

To specify a default style sheet

- 1 Click Tools, Settings, Preferences.
- 2 In the Preferences dialog box, click the Forms/Reports page.
- 3 Do one or both of the following:
 - To specify a default style sheet for the screen, choose a style from the Screen Style Sheets list box.
 - To specify a default style sheet designed for the printer, choose a style from the Printer Style Sheets list box.



- The extension of the style sheet (.FT or .FP) depends on whether your design document is designed for the screen (.FT) or for the printer (.FP).

Accessing a style sheet from any working directory

When you save a style sheet, Paradox stores it in the current working directory. You can, however, make the style sheet available from any project by saving it to the root Paradox directory.

To move the style sheet to the Paradox root directory

- 1 Click Tools, Utilities, Rename.
- 2 Choose Screen Style Sheets from the Files Of Type list box.

- 3 Type the name of the appropriate style sheet in the File Name box.
- 4 Click OK to display the Rename To dialog box.
- 5 Type the new path for the style sheet in the File Name text box.
- 6 Click Rename.

Saving a design

When you save a form or report, you save the design, not the data itself. Paradox always saves data to the appropriate table when you leave each record. Not only do you save the properties of the document, but also the layout of the document.

To save a form or report design

- 1 With a form or report open in the Design Window, click File, Save.
- 2 Type a name for the form or report in the File Name box and click Save.



- It isn't necessary to type a file extension when you save a design document. Paradox automatically gives design documents the appropriate extension so Paradox can access them by their type.
-

Using design objects in forms and reports

Design objects are objects you place in forms and reports in a Design Window. You create design objects with Toolbar tools. Design objects include

- text objects
- boxes, lines, and ellipses
- fields and table frames
- crosstabs and charts
- multi-record objects
- buttons
- graphics
- OLE objects
- notebook objects
- ActiveX (OLE) and native Windows controls

Some objects (like buttons and notebooks) and ActiveX controls can be used only in forms, and other objects, such as bands and page breaks, are used only in reports.

All design objects, except for the text object, have a default size. Click the appropriate tool on the Toolbar, then click in the form or report to place the object. Paradox creates the object at its default size. You can resize any object by dragging the sizing handles that surround the object.

Selecting design objects

By default, you can select any object in a Design Window. When an object is made unselectable, you can select any object it contains, but you cannot select the container object. This means you cannot move the object or perform any other action that requires the object to be selected.

Selecting and deselecting design objects

You must select a design object in order to alter its properties.

To select a design object

With a form or report open in the Design Window, do one of the following:

- To select a field, click the object.
- To select specific text, click and then click again to place the cursor in the text then drag to select the text.
- To select multiple objects, hold down SHIFT or CTRL and click the objects.
- To select adjacent objects, hold down SHIFT and click and drag to surround the objects with a box.

Handles appear around the selected object(s) and the name of the object appears on the Status Bar in the lower-right of your screen.

To deselect a design object

- Hold down SHIFT or CTRL and click the object you want to deselect.

Making a design object selectable or unselectable

Occasionally you may want to set an object so that it cannot be moved or change shape. You can achieve this by making the object unselectable.

To prevent an object from being selected

- 1 With a form or report open in the Design Window, right-click the object and click Properties.
- 2 Click the Design page.
- 3 Disable the Selectable check box.

To make an unselectable object selectable

- 1 Open the Object Explorer.
- 2 Right-click the unselectable object in the Object Explorer tree, and click Properties.
- 3 Click the Design page.
- 4 Enable the Selectable check box.



- You can still change an unselectable object's properties by right-clicking it in the Object Explorer tree and clicking Properties.
-

Placing, grouping, and stacking design objects

You can use the toolbar to place a design object on your form or report. By constraining objects as you place them, you can create perfect circles, squares, and vertical or horizontal lines. Once you have an object on your form or report with properties that you like, you can duplicate this object.

Grouping design objects

You can group objects to have them behave as one object during certain operations.

When you select a group, a single set of handles forms a rectangle that surrounds the whole group. You can move or delete the group as a whole. Groups act like other containers, except they contain only the objects you selected. They are especially useful if you want some, but not all, close objects to act like a unit. Use groups to

- create a collection of objects that you want to use as a one object
- preserve the relative positions of design objects when you move or resize them
- influence tab order in forms

You can view or change a group's properties, and you can attach ObjectPAL methods to the group.

Stacking design objects

Objects in a design document can be on top of or underneath other objects. You can change the layering of objects or groups of objects. Tab order in the Design Windows corresponds to stacking order (back to front). You can use the stacking commands to adjust your form or report design. Stacking order does not affect tab order at run time which is controlled by Choose the Next Tab Stop, and Tab Stop properties.

Placing a design object on a form or report

You can place any design object at any position on a form or report. You can constrain lines, boxes, and ellipses if you hold down SHIFT when you click or click and drag. When you constrain a box, it becomes a square; an ellipse becomes a circle; a line is forced to be horizontal, vertical, or at a 45-degree angle.

To place a design object on a form or report

- 1 With a form or report open in the Design Window, click the tool you want to use.
- 2 Do one of the following:
 - Click the form or report to place the object at its default size.
 - Drag to size the object as you place it.

To keep a tool active so you can create multiple objects of the same type

- Hold down SHIFT when you click the tool you want from the Toolbar. The tool remains active until you click another tool, or click the Selection Arrow.

Duplicating a design object

You can place a duplicate of an object adjacent to the original object. The duplicated object is a completely independent object, just as if you had copied the original to the Clipboard and then pasted it into your report or form, or created it using the tool on the Toolbar. The object is not placed on the Clipboard.

If the object you are duplicating is a table or multi-record object, a duplicate would violate the rule that a report cannot have two objects of the same type that represent the same table in the data model. When you duplicate an object of this type, Paradox creates the object with an undefined table that has the same table-level properties (for example color and column positions) but in which the fields are replaced by undefined fields.

To duplicate a design object

- 1 With a form or report open in the Design Window, select the object you want to duplicate.
- 2 Click Edit, Duplicate.

Paradox puts a copy of the selected design object just below the original design object. You can move and resize the copy.



- You can duplicate objects only within the same Design Window, not from one window to another.
-

Grouping design objects

You can group objects to have them behave as one object during certain operations.

To group design objects

- 1 Hold down SHIFT and select the objects you want to group.
- 2 Click Format, Group.

To ungroup design objects

- 1 Select the group.
- 2 Click Format, Ungroup.



- Groups can exist within other groups. You can select a group and select other design objects, then group all of them together. The first group remains intact within the larger group.
 - You can view or change a group's properties, and you can attach ObjectPAL methods to the group.
-

Stacking design objects

Objects in a design document can be on top of or underneath other objects. You can change the layering of objects or groups of objects.

To stack design objects

- 1 Select the object you want to stack.

- 2 Click Format, Order, and then click one of the following:
 - Bring To Front—moves the selected object in front of all other objects.
 - Send To Back—moves the selected object behind all other objects.



- Bring To Front and Send To Back change the order only within a container.
 - If objects have transparent colors, it might be difficult to determine their order.
 - If you select a group of objects and click Bring To Front, the internal ordering of the group is maintained and the entire group is brought to the front.
-

Viewing design objects

Not only can you change the run time properties of design objects — such as shape, position, and color — Paradox allows you to change the way in which you view design objects as you are creating a form or report. For example, you can choose to see the frame of an object as you move or resize it, or you can choose to display the size and position of the object on the Status Bar of the Design Window.

Displaying frames for design objects

You can display objects on your screen with or without frames.

To display frames for design objects

- 1 With a form or report open in the Design Window, click Format, Design Setup.
- 2 In the Settings dialog box, enable the Frame Objects check box.



- When you enable the Frame Objects check box, objects without a clear frame or outline are outlined by dotted lines to help you see them. If you have many of these objects, you might want to disable this option.
 - When you disable the Frame Objects check box, Paradox shows a frame only if you have changed the object's Frame property (the frame's color, style, or thickness). These frames appear only in Design Windows.
-

Displaying outlines for design objects while moving or resizing

You can specify what you see when you move or resize an object. When you enable the Outlined Move/Resize check box, Paradox displays the outline of the object whenever you move or resize the object.

To display outlines for design objects while moving or resizing

- 1 With a form or report open in the Design Window, click Format, Design Setup.
- 2 In the Settings dialog box, enable the Outlined Move/Resize check box.



- When you disable the Outlined Move/Resize check box, Paradox displays the object itself whenever you move or resize it. Most moving and resizing operations are faster when you enable the option because Paradox does not redraw the screen image until the operation is complete. However, some operations are clearer when you can see what is happening throughout the operation.
-

Displaying design object size and position on the status bar

When you move or resize an object, the left side of the Status Bar tells you which object is moving and gives its position. This can help you move or resize objects more accurately. When you finish moving or resizing, the size and position at the right of the Status Bar are updated.

To display design object size and position on the Status Bar

- Click View, Size And Position.

The right end of the Status Bar displays the position (based on an XY axis) and size of the selected object.



- On the View menu, Ruler, Grid, and Size And Position are settings, not properties or preferences.
-

Moving and aligning design objects

You can move objects in a form or report using either the mouse or the keyboard. You can also move objects indirectly using the Align and Adjust Spacing commands (Design menu).

You can align design objects to the left, right, and center horizontally, and to the top, bottom, and middle vertically. Paradox can align all design objects directly on the grid lines (major or minor) whenever you place, resize, or move them.

Moving design objects

You can move an object to any position on the form or report, as long as the object isn't pinned.

To move a design object

- 1 With a form or report open in the Design Window, select the object you want to move.
- 2 Drag the object or use the arrow keys to move the object to its new position.



- When you move an object, holding down SHIFT while you drag forces the object to move only horizontally or only vertically. If you move the mouse along a diagonal line that is flatter than 45 degrees, the object moves horizontally; otherwise, the object moves vertically.
-

Aligning design objects

When a design object snaps to the grid, its top left corner is moved to the nearest intersection of grid lines. An object aligns by its upper left corner or by the edge you are resizing. If an object cannot move to that position (because it is blocked by the edge of its container, for example), it will get as close as possible. The grid has no influence on the position of objects contained in text.

To align design objects

- 1 With a form or report open in the Design Window, hold down SHIFT and click to select the objects you want to align.
- 2 Click Format, Alignment and click one of the following options:
 - Align Left—aligns the left side of each object with the left side of the left-most object.
 - Align Center—aligns the midpoints of the objects vertically.
 - Align Right—aligns the right side of each object with the right side of the right-most object.

- **Align Top**—aligns the right side of each object with the top of the highest object.
- **Align Middle**—aligns the midpoints of the objects horizontally.
- **Align Bottom**—aligns the bottom of each object with the bottom of the lowest object.

To snap objects to the grid

- With a form or report open in the Design Window, click **Format, Snap To Grid** so that a check mark appears beside the option.

Objects move to the closest grid point if the **Snap To Grid** property is enabled.



- Objects that are inside a table align within their column.
 - Objects never leave their containers to align; the objects move as far as they can in the indicated direction. Aligning objects does not break the container relationship.
 - Objects that are in different bands in a report cannot be aligned vertically using the **Format, Alignment** command.
 - Internally generated resizes (such as when you add text to a text object or define a field object) do not snap to the grid.
-

Adjusting the spacing of design objects

You can adjust design objects so that the space between the objects is exactly the same.

To adjust the spacing of design objects

- 1 With a form or report open in the Design Window, hold down **SHIFT** and click to select the design objects you want to adjust.
- 2 Click **Format, Spacing**, and one or both of the following:
 - **Horizontal**—adjusts the horizontal spacing between the objects.
 - **Vertical**—adjusts the vertical spacing between the objects.

Pinning design objects in place

To make sure an object in a form or report does not get moved accidentally in the Design Window, pin the object to the design. You can move pinned

objects by actions such as Design, Align. Pinning only prevents you from inadvertently moving an object with the mouse.

You pin an object relative to its container. You can move a pinned object's container as long as the container itself is not pinned. Moving or resizing an object to surround a pinned object does not cause the pinned object to become contained, even if it is fully within the resized object's boundaries.

To pin design objects on a form or report

- 1 With the form or report open in the Design Window, right-click the object and click Properties.
- 2 Click the Design page.
- 3 On the Design page of the Properties dialog box, enable one or both of the following check boxes:
 - Pin Horizontal—if you want to be able to move the object up or down, but not left or right.
 - Pin Vertical—if you want to be able to move the object left or right, but not up or down.



- Pinning has no influence on objects that contain text.
- In addition to pinning objects in the Design Window, you can also pin them when you run (print or view) a report.



- Enable both Pin Horizontal and Pin Vertical to keep an object from moving in any direction.

Sizing and shaping design objects

Although design objects have a default size and shape, you can modify these properties at any time while in Design mode. You can also change the shape and spacing of an object relative to other design objects on the form or report, or set a field so that it contracts and expands to fit the size of its contents.

Changing the size and shape of a design object

You can make design objects larger or smaller, as well as constrain them so that they take on a fixed shape or stretch them so that they take on any shape that suits your needs. You can make a field expand or contract in the Design Window when its contents get larger or smaller. (This can happen when you

make changes to the field-object properties such as display type, font, or size.)

To change the size or shape of a design object

- 1 With a form or report open in the Design Window, click the object you want to resize.
- 2 Do one of the following:
 - Drag the object's handles.
 - Hold down SHIFT and drag a corner handle to constrain the object.

When you constrain an object, all objects except lines maintain their current proportions. Lines are forced to be horizontal, vertical, or 45-degree angles.

To size a field object

- 1 With a form or report open in the Design Window, right-click the field object and choose Properties.
- 2 Click the Design page.
- 3 Enable the Size To Fit check box.



- If a text object does not resize with the handles, try right-clicking the text object and clicking Properties. Change the size of the text using the Font page of the Properties dialog box.
 - If an OLE object or bitmap does not resize with handles, turn off its Size To Fit property. (Right-click the object, click Properties, and disable the Size To Fit check box on the Design page of the Properties dialog box.)
-

Adjusting the size and spacing of multiple design objects

You can adjust the size and spacing of design objects to achieve a symmetrical look. For example, if you create a group of buttons you can make them all exactly the same width and height. If Paradox cannot resize an object, it disregards that object and resizes all other objects.

To adjust the size and spacing of multiple design objects

- 1 With a form or report open in the Design Window, hold down SHIFT and click to select the objects you want to adjust.
- 2 Click Format, Size, and then click one or more of the following:

- Minimum Width—resizes all objects to the width of the narrowest object
- Maximum Width—resizes all objects to the width of the widest object
- Minimum Height—resizes all objects to the height of the shortest object
- Maximum Height—resizes all objects to the height of the tallest object

Magnifying the display of a graphic or OLE field

By default, Paradox displays a graphic or OLE object at 100% of its original size.

To change the magnification of a graphic or OLE field

- 1 Open a form.
- 2 Right-click the graphic or OLE field and click Properties.
- 3 Click the Magnification page and then click one of the following:
 - 25% or 50%—shrinks the displayed object
 - 100%—displays the object in its original size
 - 200% or 400%—magnifies the displayed object
 - Best Fit—shrinks the object to fit in the field while retaining the proportions of the original object. When you click Best Fit, changing the column width or row height changes the size of the object.



- For fastest performance, display graphic and OLE objects at 100%. Best Fit usually provides the slowest performance.
-

Containing design objects

When one object exists completely within the borders of another, it can be “contained” by the outside object. Contained objects move when you move their containers and are deleted when you delete their containers. To be a container, an object must have the Contain Objects property enabled on its Design page. Otherwise, objects within its borders remain independent.

If you disable the Contain Objects property for an object, the object moves independently of any objects within its boundaries. When enabled, all objects within the object’s boundaries become contained by the object.

You cannot change the Contain Objects property on some objects (table frames, records, fields, pages, bands in reports, multi-record objects,

crosstabs, and pages in forms). The contents of these objects can exist only as part of the object. For example, a record cannot exist apart from the table frame within which it is contained.

Tab order

The containership hierarchy influences default tab order because you must tab to all objects within a container before you can tab out of the container. You can alter the tab order more effectively from the Run Time page of the Properties dialog box.

To examine the containership hierarchy of your design, use the Object Explorer.

Unbreakable contained relationships

You cannot move certain objects out of their containers under certain circumstances. For example, if you are working with a labeled field object, you cannot move either the field label (a text object) or the field edit region out of the container. This is because the labeled field object, by definition, includes all three parts in a contained relationship.

Creating a contained design object

By default, all objects that can use the Contain Objects property have that property enabled on the Design page of the Properties dialog box (right-click object, click Properties, and enable the Contain Objects check box on the Design page of the Properties dialog box).

To create a contained design object

- 1 With a form or report opened in the Design Window, select the container object.
- 2 Right-click the object and click Properties.
- 3 Click the Design page.
- 4 Enable the Contain Objects check box.
- 5 Place the object you want to contain inside the container object by doing one of the following:
 - create a new object within the borders of an existing object
 - move an existing object completely within the borders of another object
 - move or resize a container around an object
 - paste an object into another object



- The contained object must be completely within the borders of the container object. If the container object has a frame, the contained object must be completely within the frame.



- You can contain objects in tables only if they fit fully within a column and row. If you remove a field from a table, it can be very difficult to put the field back if the cell the field left was exactly sized to fit (as they are by default). In such a case, try widening the column slightly and making the row slightly larger.
- If Snap To Grid is enabled, it may be difficult to contain one object in another because both objects might try to align on the same grid line. In this case, resize one or both of the objects so they snap to different grid lines, or turn off Snap To Grid.

Selecting a contained design object

Suppose you have an ellipse contained in a box. By default, when you click the ellipse, Paradox selects the outermost object first. Therefore, although you click inside the ellipse, Paradox selects the box. A second click selects the ellipse.

To have Paradox permanently select a contained object on the first click

- 1 With a form or report opened in the Design Window, click Tools, Settings, Preferences.
- 2 Click the Designer page.
- 3 Enable the “Select From Inside” on page 201 check box.

To have Paradox temporarily select a contained object on the first click

- 1 With a form or report open in the Design Window, click Format, Design Setup.
- 2 Enable the Select From Inside check box.

Deleting a contained design object

If you delete an object that has the Contain Object property enabled, Paradox deletes the object and everything it contains.

Keep these rules in mind when you delete objects in container relationships:

- Deleting a container deletes any objects in the container.
- Deleting a contained object does not affect its container.

To delete a contained design object

- 1 Select the contained object you want to delete.
- 2 Click Edit, Delete.

Breaking a container relationship

In order to delete a container but not its contained objects, you must first break the container relationship.

To break a container relationship

- Right-click the container object, click Properties and disable the Contain Objects check box on the Design page of the Properties dialog box. (You can also select the contained object and move it outside the border of the container.)

You do not need to move the contained object completely outside the container borders. The relationship is broken when part of the contained object is moved outside the container frame.

To delete a container but not its contained objects

- 1 Follow the above procedure.
- 2 Select the container, and click Edit, Delete.



- Alternatively, you can multi-select the contents and move them out of the container or cut them to the Clipboard, delete the container, and move or paste the objects back into position.
-

Naming design objects

When the object is selected, its name appears on the Status Bar. Paradox automatically names an object with its type and a number. For example, #ellipse32 or #box3. You can replace these names with names of your own choice at any time.

Why name objects?

The name of a selected object appears on the Status Bar and in some error messages. Naming objects can help you determine which object is selected in a complicated design.

In a form, all design objects can have ObjectPAL methods attached to them. ObjectPAL refers to objects by name.

In a report, you can use object names in defining calculated fields.

Naming a design object

Object names can be up to 32 characters long and cannot begin with a number or symbol.

To name or rename a design object in the Properties dialog box

- 1 With a form or report open in the Design Window, right-click the object and click Properties.
- 2 On the General page of the Properties dialog box, type the new name for the object in the Name Of Object box.

To name or rename a design object in the Object Explorer

- 1 Open the Object Explorer.
- 2 Select the object that you want to name or rename.
- 3 Click the current name three times until the cursor appears.
- 4 Enter the new name.



- If you name an object in a function or a method and change its name, your method or function will fail.
 - Only letters, numbers, the underscore character (“_”), and the pound sign (“#”) can be used in an object name. Object names cannot contain spaces.
-

Placing scroll bars on design objects

Objects in forms and reports can have scroll bars, but the scroll bars differ in forms and reports.

About scroll bars in forms

When you place a scroll bar on an object in a form design, the scroll bar appears when the form runs, and the user can scroll through the object. You can add scroll bars to the following object types:

- text objects (vertical scroll bar only)
- graphic objects
- OLE objects
- field objects
- table frames (Paradox automatically places a horizontal scroll bar along the bottom of a table frame if you define a table that is too large to fit on the page when the Size To Fit check box is enabled on the Design page of the Properties dialog box.)
- multi-record objects
- notebook objects (For more information, see “Placing a scroll bar on a notebook” on page 440.)
- form pages
- report pages in the Design Window

About scroll bars in reports

Some objects in reports can have scroll bars, but the scroll bars do not appear when the report is being previewed or printed. You use the scroll bars in a Report Design Window to view text and graphics that don't fit in their allocated space. At run time, the object expands to fit its contents and the scroll bars disappear. When the object expands, it may push other objects that are beneath it or to the right.

Text objects

When you work with a text object in the Report Design Window, you can place a vertical scroll bar along its right side. You can then enter large amounts of text in the Design Window without resizing the text object.

When you run the report, Paradox can expand the text object vertically down the page to display its entire contents. The expansion of the text object may push objects that are beneath the text object. You can control the effects of object expansion by setting run time properties on the Run Time page of the Properties dialog box.

Graphic and OLE objects

If you resize a graphic or OLE object container to be smaller than its contents, you can place scroll bars across its bottom or along its right side. Use the scroll bars to view different sections of the object. Use this technique to crop the object to show only part of it.

When you preview or print the report, the object's Size To Fit property on the Run Time page determines whether the frame expands to fit the contents or remains fixed and shows only part of the graphic or OLE object.

Tables and multi-record objects

You can place a horizontal scroll bar on a table frame in a report to allow you to scroll through the table frame in the Report Design Window. When you run the report, Paradox deletes the scroll bar and expands the table frame to display its entire contents. The expansion may push objects that are beneath the table frame. You can control the effects of object expansion by setting the run time properties on the Run Time page of the Properties dialog box. If a table's contents are too wide to fit on the page, you can indicate in the Print File dialog box how to handle data that do not fit on the page.

Placing a scroll bar

You can place either a vertical or horizontal scroll bar on your design document using the Properties dialog box. Paradox's default scroll bar width is narrow.

To place a scroll bar on an object

- 1 With a form or report open in the Design Window, right-click the object and click Properties.
- 2 On the General Page of the Properties dialog box, enable one of the following check boxes:
 - Horizontal Scroll Bar—places a scroll bar along the bottom of the object.
 - Vertical Scroll Bar—places a scroll bar along the right side of the object.

To display a standard-width scroll bar

- 1 With a form or report open in the Design Window, right-click the object and click Properties.

- 2 On the General page of the Properties dialog box, enable the Wide Scroll Bar check box.

This setting affects both the horizontal and vertical scroll bars for the selected design object.



- The scroll-bar properties vary depending on what object you have selected. For example, text objects do not have Horizontal scroll bars.
-

Changing design object properties

You can change the properties of any object on your form or report. By changing the properties of objects you can customize your forms and reports so that they best suit your requirements. By right-clicking on any object in a design document, and then clicking Properties, you can display an object-specific dialog box that allows you to alter the properties of that specific object. You can also change an object's properties in the Object Explorer.

Changing properties using the Object Explorer

If your form or report contains many objects, and especially if you attach ObjectPAL code to them, you might forget what something does or its name. Paradox provides a way to view the design and see all objects you have placed.

The object tree of the Object Explorer displays a schematic diagram of your form or report design. This diagram shows you the design objects and their relationship to one another. The object tree is especially useful if you have a large design and do not want to use the scroll bars to navigate around your design.

To change the properties of a design object

- 1 Display the Object Explorer in one of the following ways:
 - Press CTRL + SPACEBAR.
 - Click Tools, Object Explorer.
 - Right-click an object and click Object Explorer.
- 2 Click an object in the object tree.
- 3 Use one of the following methods to change an object's properties:

- In the object tree, right-click the object and click Properties. Change the properties on the appropriate property page (you can use the arrow keys to move from object to object in the object tree).
 - In the tabbed Property page, right-click the property and click Edit. Press ENTER and type the name of the new property.
- 4 Click File, Close to close the object-tree window.

Changing penetrating properties

Penetrating properties are properties that Paradox can apply to any object in a selected group and to any objects contained by a selected object. You can use the penetrating properties to change the properties that multiple objects have in common in a form or report. For example, if, after creating a form with multiple fields on a page, you want to change the color of the edit region for all the fields, you can select all of the edit regions and change the color property one time. Or, if you have multiple objects that are different but contain common properties, you can select all objects and Paradox applies your property choices to the objects for which the property is valid. This can save you a lot of time when you design a form or report

To change penetrating properties for different objects with common properties on a form or report

- 1 With a form or report open in the Design Window, hold down CTRL and select the appropriate objects, hold down CTRL and right-click one object.
- 2 Use the Objects in Selection Properties dialog box to change properties as appropriate.

Paradox applies your property choices to all objects for which the property is valid and to any objects contained by the selected object.

To change penetrating properties of same type objects on a form or report

- 1 With a form or report open in the Design Window, hold down SHIFT and select the appropriate objects, right-click one of the objects and select Properties from the list box.
- 2 Use the Properties dialog box to change the properties as appropriate.



- If you select a contained object, Paradox applies the changes to each object within the contained object. To change properties for the container only, select the container, right-click and choose Properties.
-

Changing penetrating properties of all objects

You can change the properties for either the form or the report document itself, or for the form or report document and all the objects it contains.

To change penetrating properties of all objects

- 1 With a form or report open in the Design Window, press ESC until the lower-right corner of the Status Bar indicates that the Form or Report is selected.
- 2 Choose one of the following:
 - To change only the design document itself, press F6 and click Properties.
 - To change the design document and all the objects it contains, press SHIFT + F6.

To change the penetrating properties for everything in a form

- If you select nothing and right-click, you'll see the page's property menu. Paradox applies your property choice only to the page.
- If you select nothing and hold down CTRL and right-click, you'll see the penetrating properties of the page. Paradox applies your property choice to the page and all objects on the page for which the property is valid.
- If you select nothing and hold down CTRL and right-click the window's Title Bar, you'll see penetrating properties for all pages of a multi-page form.

To change the penetrating properties for everything in a report

- If you select nothing and right-click, you'll see the selected band's property menu. Paradox applies your property choice only to that band.
- If you select nothing and hold down CTRL and right-click, you'll see the penetrating properties of the selected band. Paradox applies your property choice to the band and all objects in the band for which the property is valid.
- If you select nothing and hold down CTRL and right-click the window's Title Bar, you'll see the penetrating properties for all bands of the report.

Attaching methods to design objects

ObjectPAL is Paradox's database-application development language. You use ObjectPAL by attaching methods, which are pieces of ObjectPAL code, to

objects on a form. You can create methods that manipulate data, respond to actions, and perform functions.

All objects in a form, including the underlying page of the form, have Object Explorer available from their right-click menus. Click this option to define the ObjectPAL methods you want to attach to the object.

For information about creating methods, see “Creating a custom method” in the ObjectPAL Reference Guide.

Refer to your ObjectPAL documentation for information about using ObjectPAL.

Designing forms

Forms are a good tool for data entry. You design a form to display the data from one or more tables and use the form to enter and edit the data in the tables. Any change you make to the data in the form is reflected in the table.

Use the Form Design Window to create a form. This window does not display a table’s data. To see the data, run the form.

When you design a form you can

- add or remove design objects, such as boxes, fields, tables, and charts
- change the properties of any design object on the form
- add ObjectPAL methods to the design objects to customize their functionality
- add, delete, or rearrange pages
- customize a default form
- run a form to view and edit data

Creating and opening a form

Paradox allows you to either create a form from scratch, or to use an expert which will assist you in developing a form that meets your demands. You can also modify an existing form, if you have already developed a form that suits your needs, or you can create a form based on a previously created report.

Creating a new form

You can create a new form in three ways: by creating the form from scratch, by modifying an existing form, or by copying an existing form and renaming it.

To create a blank form

- 1 Click File, New, Form.
- 2 Click Blank.

Paradox opens a blank Design Window that is not bound to a table, and that contains only a single page for forms or, a report header and footer, page header and footer, and record band for reports.

To modify an existing form

- 1 Click File, Open, Form to open a form.
- 2 In the Open dialog box, use the Look In list box to locate the form you want to open.
- 3 Type the name of the form in the File Name box.
- 4 Enable Edit The Form Design.
- 5 Click Open.

To make a copy of a form from the Project Viewer

- 1 Click Tools, Project Viewer.
- 2 Click the Forms icon to view forms.
- 3 Right-click a form in the right-hand panel of the Project Viewer and click Copy.
- 4 In the Copy To dialog box, type the name of the new form in the File Name text box.
- 5 Click Copy.

Paradox creates a copy of the form with the specified name.

Designing a form from a report

You can open a form as a report or a report as a form. If a report's data model and layout are just what you want for a form, you can open the report as a form without recreating the design. Paradox determines the form's layout from the record band of the report. Because forms do not use the banded layout that reports do, objects in group, page, or report bands are not included in the new form design.

Some objects behave differently in forms and reports. Calculated fields and summary fields, for example, look at data differently; therefore, you might need to modify them to get the correct results. Summary fields located in the record band of a report work correctly in a form. If the report design includes a page break in the record band, Paradox creates a multi-page form.

To design a form from a report

- 1 Click File, Open, Report.
- 2 From the Open Report dialog box, choose the report you want to use.
- 3 Enable Open As A Form.

Paradox creates and opens a new form based on the contents of the report's record band, including design properties and page breaks.



- Paradox does not change the existing report.
-

Opening an existing form

You can open an existing form in either design mode — where you can change the appearance of the form — or run mode — where you view and edit the data in the form.

To open an existing form

- 1 Click File, Open, Form.
- 2 In the Open Form dialog box, select the form you want to open.
- 3 Enable one of the following check boxes:
 - View the Form—to display the form
 - Edit the Form Design—to modify the form design
 - Open As A Report—to open the form as a report (this is a quick way to use a form layout to specify the layout of a report)
- 4 To use a form design with a different table, click Change Table and select a different table.
- 5 Click Open.

Page size and layout (forms)

Page layout specifies the page size for a form. You can use a predefined page size, or you can specify a custom width and height.

Designing for the screen

By default, Paradox designs forms for the screen. You can use any screen fonts that are installed on your system. If these fonts are not available on your printer, documents you create for the screen might not be identical to their printed versions.

When you design for the screen, Paradox uses your system's current screen driver size (in pixels) in the Screen Size panel of the Page Layout dialog box. You can change the size and specify the unit of measurement for a custom size.

When you design a form for others to use, consider the screen display with which users will view the form. It's best to use standard color and font choices, as well as standard sizes for form windows, to ensure the usability of the finished form.

Designing for a printer

If you design for a printer:

- Paradox makes available only fonts that are currently installed on your active printer. This may limit your onscreen display, but it ensures a similar document for onscreen viewing and printed output.
- Paradox attempts to match the onscreen view with the printed output. This means that the screen fonts might not match the printer fonts exactly in height or width. Size-to-fit objects are sized based on the printer's font sizes. On the screen, this might cause clipping or text objects that seem to wrap too soon, but on paper they will look correct. When you design for a printer, be careful not to cause unwanted clipping by sizing objects to a screen font.

You can design the form using portrait or landscape orientation.

- If you choose landscape in the Page Layout dialog box, Paradox will print the form from left to right along the longest side of the paper. However, you still need to set the printer for the desired printing orientation. If you choose portrait for both the Paradox and printer settings, the form will print from left to right across the shorter side of the paper.
- If you choose landscape for both the Paradox and printer settings, the form will print across the longest side of the paper.
- If you choose landscape in Paradox, and portrait in the printer settings, then tile the form by setting Create Horizontal Overflow Pages As Needed in the Print File dialog box, the form prints across as many portrait-oriented sheets as necessary. These settings are useful if, for example, you want to bind a form with wide pages in a normal 8.5x11 format (book-like).

Changing the page layout for a form

You can specify that all documents default to a certain onscreen size, or you can change the page layout for a single form.

To change the page layout for a form

- 1 With a form open in the Design Window, click File, Page Setup.
- 2 In the Page Setup dialog box, enable one of the following buttons in the Design for section:
 - Printer—to design for the printer (primarily used for reports).
 - Screen—to design for the screen (primarily used for forms).
- 3 Select the desired units of measure.
- 4 Select a predefined page size, or type a custom size in the Width and Height boxes.
- 5 If you are designing the form for the printer, enable the desired paper orientation.

To specify a default onscreen size

- 1 Click Tools, Setting, Preferences.
- 2 Click the Forms/Reports tab.
- 3 Disable the Size To Desktop check box.
- 4 Choose the appropriate unit of measurement.
- 5 Type values in the Width and Height boxes.

Every time you create a form, Paradox will create it with the specified default size.

Working with multi-page forms

If the objects on your form do not fit on a single screen, you can create multiple pages for the form. You place design objects on each page, and the user views the different pages while running the form. You may design a multi-page form so that the pages are side-by-side or stacked on top of one another, as is described in “Tiling form pages” on page 233.

You can also create a form with multiple images by placing a Notebook object on the form.

When you work with a multi-page form, you must add each page. You cannot place a page break on a form the way you would in a report.



- ObjectPAL applications that are designed using a multi-page form are often faster than applications that open and close multiple forms.
-

Adding a form page

You cannot add a blank page between existing pages, but you can add a blank page and then rotate or move pages to rearrange their order.

To add a form page

- With a form open in the Design Window, click Insert, Page.

Paradox adds a blank page to the form at the end of the existing pages.



- When you work with multi-page forms, you might want to click View, Zoom, Best Fit to see all the pages of the form on the screen at the same time.
-

Cutting, copying, pasting, or deleting a form page

Once you have created the basic format for your multi-page form, you can cut, copy, paste, or delete pages to make your form conform to your needs.

To cut a page

- 1 With a form open in the Design Window, select the page you want to cut.
- 2 Click Edit, Cut.

Paradox removes the page and all objects on the page.

To copy a page

- 1 With a form open in the Design Window, select the page you want to copy.
- 2 Click Edit, Copy.

Paradox copies the page and all objects on the page.

To paste a page

- 1 Copy or Cut the page in the Design Window.
- 2 Select the page that will follow the pasted page.
- 3 Click Edit, Paste.

Paradox inserts the pasted page before the selected page. For example, if you cut page 2 of a five-page report, select the last page, and paste page 2, Paradox inserts the page as page 4.

To delete a form page

- 1 With a form open in the Design Window, select the page you want to delete.
- 2 Do one of the following:
 - Press DELETE.
 - Click Edit, Delete.
 - Click Edit, Cut.



- Cut overwrites the Clipboard, DELETE does not.
-

Rotating form pages

Paradox allows you to move a selected page to the last page's position. For example, if you select page 2 of a five-page form and click Format, Rotate Pages, Paradox moves page 2 to the end of the form (page 5) and moves pages 3, 4, and 5 up one position.

To rotate form pages

- 1 With a form open in the Design Window, select the page you want to rotate.
- 2 Click Format, Rotate Pages.

Tiling form pages

Use tiling to control the onscreen display of form pages when you are working with a multi-page form. Display only one page at a time (stacked) or arrange pages either across or down the screen.

To tile form pages

With a form open in the Design Window, click View, Tile Pages, and click one of the following options:

- Stack Pages—displays the pages one at a time, one on top of another.
- Top And Bottom—displays the page vertically down the screen (default option).
- Side By Side—displays the pages horizontally across the screen.

Specifying the form window style

You can create a form that is either a window or a dialog box. Within the Window Style dialog box, you can choose which window style you want, as well as alter frame properties, title bar properties, and window properties.

Forms as windows

If you specify Window in the Window Style dialog box, Paradox opens the form as a window when it is run. This means the form

- acts like any other window in Paradox.
- can be altered by the user.

Forms as dialog boxes

If you specify Dialog Box in the Window Style dialog box, Paradox opens the form as a dialog box when it is run. This means the form

- appears in the center of your screen.
- appears on top of all open windows.
- can be moved like any other dialog box.
- cannot be resized by the user.

Frame properties

The Dialog Frame property displays the dialog box as a standard Windows dialog box frame. The border, colors, and other settings are set from the Windows Control Panel. The Border property displays the dialog box with a border instead of the default Windows style. The Thick Frame property displays the dialog box with a thick black border instead of the normal Windows style. Thick Frame is unavailable if you choose Dialog Frame.

Title Bar properties

The Control Menu property places the standard Window Control menu in the top-left corner of the dialog box. If you open a form as a dialog box and it does not have a Control menu, you can close the dialog by pressing ALT + F4. The Minimize Button property places a Minimize button on the top-right corner of the dialog box. The Maximize Button property places a Maximize button on the top-right corner of the dialog box.

Window properties

The Title Bar property places a title bar across the top of the dialog box. Enter the text you want to appear on the dialog box's title bar in the Title box.

To display horizontal or vertical scroll bars on the dialog box, enable either the Vertical Scroll Bar check box, the Horizontal Scroll Bar check box, or both.

Enable the Size To Fit check box to have Paradox automatically size the window to fit the page size of the form. The effect of choosing Size To Fit may not be apparent unless your page size is smaller than the size of your screen display. Adjust your page size to be as small as it can be without removing any existing objects, then enable Size To Fit.

Enable the Modal check box to prevent users from working anywhere else in Paradox until the dialog box is closed.

Disable the Mouse Activates check box to allow users to click the dialog box to activate it without changing the focus to it. For example, if you've created a customized Toolbar using ObjectPAL, and you want to use the tools on that Toolbar in your dialog box, disabling the Mouse Activates property will prevent Paradox from activating the Toolbar window every time a user clicks one of its tools.

The Standard Menu option is enabled by default. If you create a menu using ObjectPAL, and want your form to use it, disable the Standard Menu check box. This applies mainly to multi-form applications. See your ObjectPAL documentation for information on customizing forms.



- For the settings you choose in the Window Style dialog box to take effect, you must save the form, close the Form Design Window, and open the form in the Form window.
-

Specifying the form window style

You can specify whether the form appears as a window or as a dialog box, and you can specify the style of the form's title and border.

To specify form window style

- 1 In the Form Design Window, click Format, Window Style.
- 2 Choose the desired window style.
- 3 Use the Windows Style dialog box to change the form's frame properties, title bar properties, and window properties.



- The form's Title Bar is not visible if the form is maximized.
 - After you change the window properties of a form, you must save the form and reopen it to see the changes.
-

Moving around a form

Paradox provides you with several ways to move around a form.

Using the navigation buttons on the Toolbar

Click the navigation buttons on the Toolbar to move quickly among a table's records in a Form window.



Move to the first record of the table.



Move up one record set (the number of records displayed in the table window).



Move to the previous record of the table.



Move to the next record of the table.



Move down one record set (the number of records displayed in the table window).



Move to the last record of the table.

Using the scroll bars

Use the scroll bars to scroll quickly through the entire form. You cannot use the scroll bars to select objects on the form.

Using the cursor-control keys

The cursor-control keys are the most reliable ways to move among records on a form. PgUp and PgDn scroll to the prior or next record respectively, while the arrow keys move from field to field.

Setting the tab order of form design objects

When you run a form, you can press TAB to move from object to object. Tab order is the order in which objects become active as you press TAB. You can modify the tab order on the Run Time page of the Object Properties dialog box. Select an object, and click Format, Properties.



- In dBASE tables, the vertical scroll box is always centered vertically when Table, Show Deleted is not checked.

Moving among fields, records, and table objects on a form

The TAB key is reliable and predictable in simple forms. As a form becomes more complex because it contains more objects, tab order can become confusing. You can always use the mouse or the cursor-control keys to move quickly to an object.

To move among fields on a form

Do one or more of the following:

- Click the field to which you want to move.
- Use the arrow keys.
- Press TAB or SHIFT + TAB.

To move among records on a form

- Click Record, Go To, and click First, Last, Next, Previous, Next Set, or Previous Set. Each of these menu choices has an equivalent shortcut key displayed next to it on the menu. You can also use the Toolbar navigation buttons or the appropriate keyboard keys (such as PgUp or PgDn).

To move among table objects on a multi-table form

Do any of the following:

- Press F4 (Super Tab) to move forward among the table objects.
- Press F3 (Super Back Tab) to move backward among the table objects.
- Press SHIFT + F3 and SHIFT + F4 to move between pages of a multi-page form.

Moving among form pages

When you are working with a multi-page form you can move to the first, last, next, or previous page.

To move among form pages

- Click View, Page, and click the page you want to display.

When you move to a page, Paradox selects it.

To go to a specific page

- 1 Click View, Page, Go To.
- 2 Type a number in the Page Number box.



- Use SHIFT + F4 to move quickly to the next page and SHIFT + F3 to move to the previous page.
 - In the Form Design Window, you can also use the scroll bars to move through the pages of a form, unless you have the pages stacked. After you scroll to a page, you must select the page to make it active.
-

Changing the Design Window tab order

When you are designing a form, objects tab in the order in which you placed them. After you move the objects around, this order might no longer make sense or you may want to avoid all objects except for the object you are working with. Paradox allows you to change the tab order while creating your form or report.

To change the tab order while designing a form

- 1 Select the object you want to be first in the tab sequence.
- 2 Click Format, Order, Bring To Front.
- 3 Repeat steps 1 and 2 for each object on the form in the order you want the user to move through the form.



- To view the changes you make, open the Object Explorer.
-



- The tab order that is set while designing a form is not the tab order used when you run the form. For information on how to change the run time tab order see “Changing the run time tab order” on page 239.

Changing the run time tab order

You can change the tab order from the default tab order of left to right, and top to bottom. For multipage forms, you can customize the tab order for each page.

To change the run time tab order

- 1 With a form open in the Design Window, right-click an object and click Properties.
- 2 Click the Run Time page.
- 3 Enable the Next Tab Stop check box.
- 4 From the list of objects under Choose The Next Tab stop, choose the object you want next in the tab sequence.

To include buttons which are not included in the tab sequence at run time in the tab sequence

- 1 With a form open in the Design Window, right-click an object and click Properties.
- 2 Click the Run Time page.
- 3 Enable the Next Tab Stop check box.

If you do not enable the Tab Stop check box, Paradox bypasses the object in the tab sequence. Users of your form can still use the mouse to select a button, OLE object, or graph, but they cannot use the mouse to select a field object.



- Changing the run time tab order is different from changing the Design Window tab order. The tab order for run time is the same as the tab order set when designing the form. For more information on changing the design window tab order, see “Changing the Design Window tab order” on page 238.



- Change the tab order once your form is near completion. This will ensure all objects are included in the tab order. However, you may add objects at any time.
-

Delivering a form

Delivery gives you a way to let others use your form, but not change the design or source code. A delivered form cannot be opened in a Design Window, and therefore cannot be changed.

When others use your form, they must also have access to all tables in the data model, along with any indexes and referential integrity files. The easiest way to make a set of tables, forms, and related files portable is to use an alias.

Delivering a form

When you deliver a form, Paradox creates a copy of the form with all source code removed. Buttons and other objects still work exactly the way you designed them.

To deliver a form

- With a form open in the Design Window, click Format, Deliver.

Paradox saves a copy of the form with an .FDL extension. The D stands for delivered.



- You can still change the original form (the one with the .FSL extension), and then deliver the form again. Your code is not lost — it's protected.
-

Form and page properties

The form, as a whole, has properties just like a design object that can be changed. You can change the color, pattern, transparency, scroll bar, and size of a page on a form by using the Properties dialog box.

To change a form's properties

- 1 With a form open in the Design Window, click Format, Properties.
- 2 Change the form properties as appropriate in the General and Pattern pages of the Properties dialog box.

To change a form page's properties

- Right-click the page, and click Properties.



- When changing the color or pattern of a form, the page's color is not transparent by default. You can make the page a different color than the form by disabling the Transparent check box in the General page of the Properties dialog box. If you enable the Transparent check box, the page will pick up the form's color and pattern properties.
 - To view the changes in form color and pattern when the page is not transparent, zoom out far enough to see the area of the form beyond the edge of the form page.
-

Using forms

Sometimes it's more convenient to work with the data from your tables one record at a time, rather than with an entire table full of data. Forms let you see as much (or as little) of your data as you want in the format you prefer. When you view data in a form, you see the same data as in the table, but Paradox arranges the data differently. If you edit data in the form, Paradox updates the data in the table.

Forms are a good tool for data entry. You can design a form to display several records from a table, or even records from several tables at the same time. You can then run the form to enter and edit the data in the tables.

Running forms

You use the Form window to run, or view, a form.

When you run a form:

- Fields show the values in the tables.
- Calculated and summary fields show computations on data in the form's tables (read-only).
- Charts and crosstabs can be used to summarize data (read-only).
- Multi-record objects can display more than one record of a table at a time in a non-tabular format.
- Table frames display as many records of each table as fit in the space you allotted. However, you can navigate through the records to show any that don't fit in the display.
- You can move from one page to another in forms and notebook objects containing multiple pages.

- ObjectPAL code that is attached to buttons is executed when you push the buttons. ObjectPAL can also be triggered at other times, for example, in ActiveX controls.

Running a form

In the Form Design Window, you view a form's design. To view or edit the form's data, you must run the form.

To run a form

- 1 Click File, Open, Form.
- 2 In the Open Form dialog box, select the file from the list box, or type the filename in the File Name box.
- 3 Enable View The Form.

To run a form from the Form Design Window

Do one of the following:

- Press F8 to run the form and view the data.
- Click View, View Data to run the form and view the data.
- Click View, Edit Data to run the form and edit the data.

Running a form with a different table

Forms allow you to view the data stored in a table that is not part of the data model. That is, you can open a form created on one table by using the data from another table or from a query. For example, suppose you have two types of vendors that you want to keep separate, but the table structure for each vendor is identical. You can design a form for the first vendor table, and instead of creating an identical form for the second table, you can open the form with the second table.

To run a form with a different table

- 1 Click File, Open, Form.
- 2 In the Open Form dialog box, select the form you want to open.
- 3 Click Change Table.
- 4 In the Select Replacement Table dialog box, select the table you want to view and choose OK to return to the Open Form dialog box.
- 5 Click Open.

If a field in the form does not have a corresponding field in the table, Paradox warns you and makes these fields undefined. Undefined fields are given the name LABEL, and no data appear in these fields.

- 6 To redefine undefined fields, switch to Design mode.



- To keep the original form intact, save the new form with a different name.
-

Viewing the Form window

Paradox allows you to customize the way in which you view the form window, and to save your changes so that they become the default view. You can also change the magnification of the form or report, either by zooming in or out, or by sizing the form to the screen size.

Zooming forms

You can change the scale of a form on screen. You can zoom out (decrease the scale and see a larger area) or zoom in (increase the scale and see part of the document up close).

To zoom forms and reports

With a form open in the Design Window, click View, Zoom and click one of the following:

- 25% or 50%—takes a step back from your document.
- 200% or 400%—takes a closer look at your document.
- Fit Width—fits the width to the window.
- Fit Height—fits the height to the window.
- Best Fit—fits the entire document to the window.

Preventing screen flashing

Sometimes the screen flashes a bit when you move from field to field. This is especially noticeable when the form you're working with has a dark background.

To prevent screen flashing

- Click Format, Design Setup and disable the Flicker-Free Draw check box.



- Enabling Flicker-Free Draw eliminates some screen flickering, but it may cause the movement from one field to another to be somewhat slower on some graphic adapters. Experiment with Flicker-Free Draw enabled and disabled to see what works best for you.
-

Displaying a memo while running a form

When you run a form with a memo field, you'll see only as many characters displayed in the memo as are specified in the field's size. These characters are followed by an ellipsis (...) to indicate that there is more information. You can display the entire contents of memo fields in a form. Click the field to select it and click View, Field View. Paradox locates the rest of the memo in the .MB file and displays it.

If you are entering data in a Form window, the text in a memo field should wrap automatically at the right side of the field object as you type. If the text does not wrap automatically, the Word Wrap property of the field object has been turned off.

To switch Word Wrap back on

- 1 Click View, Design form to switch to Design mode.
- 2 Right-click the field and click Properties.
- 3 Click the Text page.
- 4 Enable the Word Wrap text box.

Saving Form window settings

You can save the ruler, grid, and other Designer settings as preferences that are used as default settings in all Form windows.

To set default Form window settings

- Click Tools, Settings, Preferences, and make the appropriate changes on the Designer page of the Preferences dialog box.

Viewing a form's source table

When you're running a form, you can view the table on which the form was built.

To view a form's source table

- Click View, Table View.

Paradox opens a Table window to show the source table of a single-table form or the master table of a multi-table form.

Printing a form

Although forms are intended for use primarily as screen-based documents, it is possible to print a form. If you are planning on printing your form you should keep this in mind when designing it.

When you print a form, Paradox prints only the current record; use a report to print every record. If you open the form as a report and print the report, the pages of your report will be in the format of the form. See “Page size and layout (forms)” on page 229 for more information about designing forms for the printer.

To print a form's design

- 1 Open a form.
- 2 Click View, Design Window.
- 3 Click File, Print.
- 4 Specify a page range or select All to print every page.
- 5 Specify the number of copies.
- 6 Enable the Collate check box if you are printing more than one copy and you want the pages collated.

If your form page is larger than the printer paper, Paradox trims the form design.

To print a form's records

- 1 Open a form.
- 2 Click View, Edit Data or View Data.
- 3 Click File, Print.
- 4 Specify a page range or select All to print every page.
- 5 Enter the number you want printed on the first page.
- 6 Specify the number of copies.
- 7 Enable the Collate check box if you are printing more than one copy and you want the pages collated.



- Form pages won't be numbered unless you put the Page Number, and/or Number Of Pages fields on each page.
 - If you designed the form for the screen, the fonts that appear on the printed output might not match those that you see onscreen. This depends on whether your screen fonts and printer fonts match.
-



- You can modify print options or select a different printer using the Print dialog box.
-

Designing reports

Reports are printing tools. Use them to format and print your data. For example, you can use reports to create form letters, mailing labels, invoices, and presentations.

Use the Report Design Window to create a report. This window does not display a table's data. To see the data, either print or preview the report.

When you design a report you can

- add or remove design objects, such as boxes, fields, tables, and charts
- change the properties of any design object on the report
- add, delete, or rearrange pages
- customize a default report
- run a report to preview or print data

Creating and opening a report

Paradox allows you to either create a report from scratch, or to use an expert which will assist you in developing a report that meets your demands. You can also modify an existing report, if you have already developed a report that suits your needs, or you can create a report based on a previously created form.

Creating a new report

You can create a new report in a variety of ways, including creating a blank report or modifying an existing report.

To create a blank report

- I Click File, New, Report.

- 2 Click Blank.

Paradox opens a blank Design Window that is not bound to a table and contains only a single page for forms and reports, the report header and footer, page header and footer, and record band for reports.

To open an existing report

- 1 Click File, Open, Report.
- 2 In the Open Report dialog box, select the report you want to open.
- 3 Enable one of the following check boxes:
 - View The Report—to display the report
 - Edit The Report Designer—to modify the report design
 - Open As A Form—to open the report as a form (this is a quick way to use a report to specify the layout of a form)
 - Print The Report—to send the document directly to the printer
- 4 To use a report design with a different table, click Change Table and select a different table.
- 5 Click Open.

To modify an existing report

- 1 Click File, Open, Report to open a report.
- 2 In the Open dialog box, use the Look In list box to locate the report you want to open.
- 3 Type the name of the report in the File Name box.
- 4 Enable Edit The Report Design.
- 5 Click Open.

Designing a report from a form

You can open a form as a report or a report as a form. If a form's data model and layout are just what you want for a report, you can open the form as a report without recreating the design. Paradox uses the form's layout in the record band of the report.

Some objects behave differently in forms and reports:

- Calculated and summary fields look at data differently in forms and reports; therefore, you might need to modify them to get the correct results.

- If you use a multi-page form, Paradox inserts page breaks at the appropriate places in the record band.
- Buttons, notebooks, and Object Linking and Embedding (OLE) controls are not available in reports.
- OLE fields.
- Non-nested multi-record form-design layouts are not valid for reports. They will produce undefined objects.

To design a report from a form

- 1 Click File, Open, Form.
- 2 From the Open Form dialog box, choose the form you want to use.
- 3 Enable Open As Report.
- 4 To open the report in the Design Window, enable Edit The Report Design.
- 5 Click Open.

Paradox inserts the form's layout in the record band of the report.

Creating mailing labels using the Report Design Window

The Mailing Label expert can automatically create mailing labels for most standard label sizes. It is recommended that you use the Expert when you design mailing labels.

If you do not want to use the Expert, follow these steps:

To create mailing labels using the Report Design Window

- 1 With a report open in the Design Window, click the Multi-record tool and then click the record band area of the report to create the object.
- 2 Place the fields you want, in the order you want (including spacing and punctuation) in the master record region of the multi-record object.
- 3 Resize the record region to match the width and height of one label.
- 4 Adjust the width of the record band to reflect the spacing between each label.
- 5 Right-click the multi-record object and click Properties.
- 6 Specify the number of records across the page on the Record Layout page.

Merging data using the Merge Expert

The Merge expert helps you merge data from a table into a form letter created in another application such as a word processor or a Paradox report. You can choose the table's fields to include, specify a sort order, and choose a format for the data.

To use the Merge Expert

- 1 Click Tools, Experts.
- 2 Click the Merge Expert icon.
- 3 Follow the step-by-step instructions provided by the Expert.

Opening an existing report

You can open an existing report in either Design mode, where you can change the appearance of the report, or Run mode, where you view and edit the data in the report.

To open an existing report

- 1 Click File, Open, Report.
- 2 In the Open Report dialog box, select the report you want to open.
- 3 Enable one of the following check boxes:
 - View The Report—to display the report
 - Edit The Report Design—to modify the report design
 - Open As A Form—to open the report as a form (this is a quick way to use a report layout to specify the layout of a form)
- 4 To use a report design with a different table, click Change Table and select a different table.
- 5 Click Open.

Page size and layout (reports)

Page layout specifies the page size for a report. You can use a predefined page size, or you can specify a custom width and height.

Designing for a printer

By default, Paradox designs reports for the printer. If you design for a printer:

- Paradox makes available only fonts that are currently installed on your active printer. This may limit your onscreen display, but it ensures a similar document for onscreen viewing and printed output.
- Paradox attempts to match the onscreen view with the printed output. This means that the screen fonts might not match the printer fonts exactly in height or width. Size-to-fit objects are sized based on the printer's font sizes. On the screen, this might cause clipping or text objects that seem to wrap too soon, but on paper they will look correct. When you design for a printer, be careful that you do not cause unwanted clipping by sizing objects to a screen font.

You can design the report using portrait or landscape orientation.

- If you choose landscape in the Page Layout dialog box, Paradox will print the report from left to right along the longest side of the paper. However, you still need to set the printer for the desired printing orientation. If you choose portrait for both the Paradox and printer settings, the report will print from left to right across the shorter side of the paper.
- If you choose landscape for both the Paradox and printer settings, the report will print across the longest side of the paper.
- If you choose landscape in Paradox, and portrait in the printer settings, then tile the report by setting Create Horizontal Overflow Pages As Needed in the Print File dialog box, the report prints across as many portrait-oriented sheets as necessary. These settings are useful if, for example, you want to bind a report with wide pages in a normal 8.5x11 format (book-like).

Designing for the screen

You can use any screen fonts that are installed on your system. If these fonts are not available on your printer, documents you create for the screen might not be identical to their printed versions. When you design for the screen, Paradox uses your system's current screen driver size (in pixels) in the Screen Size panel of the Page Layout dialog box. You can change the size and specify the unit of measurement for a custom size. You can choose from standard page sizes, or you can enter your own measurements. You must use portrait orientation.

Changing the page layout for a report

You can specify that all documents default to a certain onscreen size, or you can change the page layout for a single report.

To change the page layout for a report

- 1 With a report open in the Design Window, click File, Page Setup.
- 2 In the Page Setup dialog box, enable one of the following buttons:
 - Printer—to design for the printer (primarily reports).
 - Screen—to design for the screen (primarily forms).
- 3 Select the desired units of measure.
- 4 Select a predefined page size, or type a custom size in the Width and Height boxes.
- 5 For printed reports, enable either portrait or landscape orientation, and define the margins.

To specify a default onscreen size

- 1 Click Tools, Setting, Preferences.
- 2 In the Preferences dialog box, click the Forms/Reports page.
- 3 Disable the Size To Desktop check box.
- 4 Choose the appropriate unit of measurement.
- 5 Type values in the Width and Height boxes.

Every time you create a report, Paradox will create it with the specified default size.

Bands

Paradox uses bands to control how sections of a report repeat. Bands run horizontally across the page and define logical sections for your report.



Reports have four types of bands:

- The report band prints information at the beginning and end of the report. The header appears at the beginning of the report and the footer appears at the end.
- The page band prints information at the top and bottom of each page in the report. The header appears at the top of each page and the footer appears at the bottom.
- The record band prints information for every record in the table(s) on which the report is based. If the record band contains a table or a multi-record object, the band appears once for every set of records in the master table.
- Group bands define sets of records based on certain criteria. They appear at the beginning and end of each group of records. Unless you choose the header property On Group Only, the header appears at the top of any page where a group continues from the previous page. You define the group criteria. Group bands are optional.

When you design a report, Paradox places the page, report, and record bands for you. You cannot remove these three bands, although you can leave them blank and collapse their height by selecting the band and pressing DELETE.

Working with bands

You can change the properties of each of the bands in either the Design Window or the Object Explorer. In the Report Design Window, right-click a band and click Properties. To display the Object Explorer, press CTRL + SPACEBAR.

The thick lines that separate each region of a report design are boundary lines that indicate the placement of report bands. Band regions print something (even white space) if their boundary lines do not touch neighboring boundary lines.

Each boundary line contains a band label with a text description and an arrow pointing toward the report region affected by that line. For example, the arrow in the boundary line of the band on the top page points down because the page header is below that boundary line.

Showing band labels

If band labels are showing, you can more easily select and manipulate bands with the mouse. Turning them off, on the other hand, can make it easier to line up objects as you design the report. Band labels are shown onscreen only in the Report Design Window (not in the report itself), and turning the band

labels on or off does not affect the layout or presentation of your printed or previewed report.

To show band labels

- With a report open in the Design Window, click View, Band Labels.
A check mark will appear beside the menu option.



- If any bands are sized to zero height, you cannot see them unless the band labels are visible.
-

Selecting a band

You can tell which band is selected by the following means:

- If you click View, Band Labels so that a check mark appears beside the option, the selected band's label will change color.
- In the sidebar along the left side of the Report Design Window, the selected band (and any bands within it) is highlighted.
- The Status Bar at the bottom of the desktop tells which band is selected.

To select a band

- Click the band label or click any white (or unused) area inside the band.

Resizing a band

You can add or remove white space in your report by resizing the bands.

To resize a band

- 1 With a report open in the Design Window, click any white or unused area inside the band to select the band.
- 2 Place the cursor on the edge of the selected band. The cursor changes to a two-headed arrow.
- 3 Drag the top or bottom edge of the band up or down to change the size of the band.
- 4 When there is an object in a band, do one or more of the following:
 - Drag the top band line to add or remove space above the object.
 - Drag the bottom band line to add or remove space below the object.



- You must resize bands by using the mouse. There is no keyboard equivalent.
- You cannot resize a band to be smaller than the objects it contains.



- You can also condense the band to zero height by deleting it. All objects in the band will also be deleted, and the band will not appear on the report.
- If you want to see more of your design on the screen, you can turn band labels off by clicking View, Band Labels so that no check mark appears beside the option.

Deleting a band

For all bands except group bands, deleting a band in Paradox means minimizing its size to zero so it will not appear in a report. Deleting a band also removes any objects in the band.

The only type of band that can actually be removed from a report is the group band.

To delete a band

- Open a report in the Design Window, select a band and click Edit, Delete.



- You can also select the band and press DELETE to remove a band.
- If you delete a band by mistake, click Edit, Undo.

Report bands

The report band defines the report header and report footer areas. Paradox prints the report header once, at the beginning of the report, and the report footer once, at the end of the report.

Typical information found in a report header would be the company letterhead or report title. A report footer might be an “end of file” statement. You place the objects that should appear as report headers or footers in the appropriate report band.

.....
An example of a
graphic object that
contains the
company logo in the
report header area.
.....



Summaries and calculated fields that are placed in the report header or footer and that summarize data for the entire table.

The report header can come either before or after the page header on the first page. Right-click the report band and click Properties, and enable the Precede Page Header check box on the General page of the Properties dialog box.

The report footer always precedes the page footer on the last page.



- You can place a page break in a report header to produce a multi-page report header or to separate the header from the first page of the rest of the report.

Changing the header order

By default Paradox prints the report header (the contents of the top report band) before the page header (the contents of the top page band). You can reverse this order.

To change the header order

- 1 With a report open in the Design Window, right-click the report band and click Properties.
- 2 On the General page of the Properties dialog box, disable the Precede Page Header check box.

Paradox will print the report header after the page header. You will not see this change in the Report Design Window because the bands themselves do not move, but when you preview or print the report, the change takes effect.

Page bands

The page band defines the header and footer areas of each page. Paradox prints the page header and footer on every page of the report.

Paradox places three objects in the top page band (the page header):

- The Today field that shows the print date of the report. Paradox places this field at the left margin of the page header.
- A field that contains the default title for the report. In a single-table report, Paradox uses the name of the table as the default title. In a multi-table report, Paradox uses the name of the master table as the default title. Paradox places the title in the center of the page header; however, if a field that grows in width (such as a date) is included in the header, the title be off-center when the report is printed. To ensure that the title is always centered, enable the Pin Horizontal Property on the title's Run Time property page.
- The Page field that shows the page number of each page. Paradox places this field at the right margin of the page header.

You can keep, delete, or change any object Paradox places for you.



- Unlike other bands, the page bands don't expand vertically when you view or print the report. This means Paradox will clip expanded objects (like tables) to fit them inside the band.



- If you want your header or footer to show the first or last records on the page, place fields in the page bands. Fields placed in the page header show the first record on your page. Fields placed in the page footer show the last record on your page. Summaries and calculated fields summarize and are calculated from all records that appear on the page.
-

Suppressing the header or footer on the first page

You can suppress the contents of the page header, the page footer, or both on the first page of your report.

To suppress the header or footer on the first page

- 1 With a report open in the Design Window, right-click the header or footer and click Properties.
- 2 On the General page of the Properties dialog box, disable the Print on First Page check box.

Printing the page footer only on the last page

Information located in the page footer area of a report prints at the bottom of every page. Sometimes it may be desirable to print information only on the last page of the report. You can place this information in the report footer; however, it will appear above the page footer. If you want this information to appear in the page footer, follow the steps outlined below.

The technique presented here involves placing three fields in the page footer (one calculated field and two special fields for Record Number and Number of Records).

To use this technique:

- Your report must be attached to a data model.
- You must have View, Band Labels enabled in the Report Design Window. Make sure that you have some white space in the page footer to allow you to place fields in that position.

To print in the page footer only on the last page

- 1 Create a field in the page footer for the special field Record Number in the master table.

Open the master table's list box to display the field list that contains <Record Number>.

- 2 Create a second field in the page footer for the master table's special field Number Of Records.
- 3 Select both the Record Number and Number Of Records fields, right-click the selected fields and click Properties, and do the following:
 - on the General page, choose Unlabeled from the Display Type list box.
 - on the Font page, change the font color to match the page's background color and click Apply.

Step 3 makes the values for Record Number and Number Of Records invisible when you print your report.

- 4 Create a third field in the page footer. This field will be a calculated field.
- 5 Enable the Calculated check box in the Define Field Object dialog box and type the following expression:

```
iif(Record_Number = Number_of_Records, "Your Value", "")
```

"Your Value" is the value that you want to print only on the last page of your report.

Record_Number and Number_Of_Records are special fields that contain data about the table as a whole.
- 6 Click OK.
- 7 If you want the calculated field to be unlabeled, right-click the field and choose Unlabeled from the Display Type list box on the General page. Otherwise, change the text of the field by clicking the word LABEL until the cursor is inside the text, and then edit the text object.
- 8 Press F8 to run the report.

The value in the calculated field that is placed in the page footer should only appear on the last page of the report.

Record bands

The record band contains the body of the report — the records of the table on which you are reporting.

You can place data elements such as fields, charts, crosstabs, multi-record objects, and table frames in the record band. These elements contain the data from your table. Paradox automatically places objects in the record band. Where Paradox places the objects depends on the type of report.

Report type	Objects placed
Tabular	The records of the table to which the report is bound appear within a table frame in the record band.
Single-record	Paradox automatically places field objects in the record band.
Multi-record	Paradox places field objects within a multi-record object in the record band.
Blank	Paradox does not automatically place any objects.

You can move, resize, or delete the objects that Paradox places.

The record band repeats once for every record in the master table, unless the record band contains a table, multi-record object, crosstab, or tabular chart on the master table. In that case, the contents of the record band appear once for every set of records in the master table.

For example, if you place a crosstab on the master table in the record band, it will be printed once for each record in the table. Usually, you should put a crosstab on the master table in either the header or footer of the report band. With a one-to-many relationship in your data model, it is often appropriate to put a crosstab in the record band of the detail table to generate a crosstab for each master's detail set.

Starting page numbers at one when a band is reached

You can begin a new page and reset the page number to one when the record band or group band is reached.

To start page numbers at one when a band is reached

- 1 With a report open in the Design Window, right-click the record band and click Properties.
- 2 On the General page of the Properties dialog box, enable the Start Page Numbers check box.

When you choose to restart page numbers for each group, Paradox changes to a page number format that shows the page number within the group (1-1, 1-2, 1-3,...2-1, 2-2, 2-3...). You cannot modify this format.

Sorting records in a record band

You have a choice when it comes to sorting the record band. You can add a group band to force a sort, filter the records, or sort the records using Sort Record Band, or if it's a detail table, take the sort order that the link implies.

To sort the records using Sort Record Band

- 1 With the report open in the Design Window, right-click the record band and click Sort.
- 2 In the Sort Record Band dialog box, specify the fields to sort on, their order, and their sort direction.



- Different types of sorts are available for different data models and produce different results. The main advantages of Sort Record Band is that you are not limited to existing indexes and you don't get a break in the table each time the sort key changes.
-

Group bands

You can place group bands in a report to break information into groups of data. You can base groups on the value of a field, a range of values, or a specified number of records. For example, you could group records by country so that all records with the same country appear together.

Paradox always places group bands between the page band and the record band.

Group header and footer

- The group header appears at the start of every group.
- The group footer appears at the end of every group.

You may want to place some sort of divider, such as a line, within the group footer to clearly show when one group ends and another begins. If you place a page break at the bottom of a group footer, you can be sure that all new groups begin on a new page. If you do this, don't leave white space after the page break at the bottom of the band.

Displaying repeated group values

You can suppress repeated group values in the record band of a report. Right-click the record band and click Properties. On the General page of the Properties dialog box, enable the Remove Group Repeat check box.

Multiple group bands

You can create more than one group band. Add group bands so that the largest data group is above all smaller data groups. For example, group by Country first, then by City. Start with the broadest category, then narrow the grouping.

Changing the position of the group bands

You can change the position of a group band relative to other group bands by selecting a group band and dragging it above or below another group band.

Exchanging group header and footer

You can exchange the group header and footer by selecting one and dragging it toward the other. The information in the selected one will be transferred to the other.

Scope of a group band

Summaries and calculated fields in the group band use the entire group as their scope. Other objects show different data depending on whether they are in the group header or the group footer. In the group header, fields show the first field in the group. Crosstabs on detail tables correspond to the first field in the group of the master table.

In the group footer, fields show the last field in the group. Crosstabs on detail tables correspond to the last field in the group of the master table.



- Use two group bands when you want to group by a number of records within a given range, or group by a range within a given number of records.

Grouping by a range

When you define a group in a report, you can specify a range of values to be met in the field on which you are grouping. For example, you might want to group the records in the Orders table by month or quarter or to group the records in the Lineitem table by the units in the Qty field. You can specify only one range group in a single report. Also, you cannot place a field group band within a range group band.

Records in a group are in sequence — lowest to highest for numbers, alphabetical order for alpha fields, and chronological for date and timestamp fields. When you group by range, the only real difference is in how often the group breaks occur.

Number fields

When you group by a range on a numeric field, groups are determined by intervals; for example, 1-5, 6-10, 11-15. The first group begins with zero and increases by the range size you specify.

Paradox accepts fractions when you define a range in number or money fields. Ranges in short, long integer, and autoincrement fields require whole numbers. You cannot define a range in Binary Coded Decimal (BCD) or time fields.

Date or timestamp fields

When you group by a range on a date or timestamp field, groups are determined by day, week, month, quarter, or year.

- Day—groups records that have the same date.

- **Week**—groups records with dates that fall in the same week (Sunday to Saturday).
- **Month**—groups records with dates that fall in the same month.
- **Quarter**—groups records with dates that fall in the same quarter of the year.
- **Year**—groups records with dates that fall in the same year.

Grouping is always chronological. For example, when you group by month, April 1998 and April 1999 appear as separate groups.

Alpha fields

When you group by a range on a Paradox alpha or a dBASE character field, you specify the number of characters on which to group in the Range Group text box (the number of characters that must match to be in the same group). For example, if the field you're grouping by is Last Name, a range of 3 would ensure that Simmons and Simpson were in the same group and that Sidney was in a different group.

A Range Group size of 1 tells Paradox to group all records that start with the same character. A Range Group size of 2 tells Paradox to group all records that start with the same two characters.

Logical

Ranges are not allowed on logical fields.

Adding or defining a group band

You can add a group band to your report if the report is bound to a table. When you create a group band, Paradox places both a group header and group footer. You may want to place some sort of divider, such as a line, within the group footer to clearly show when one group ends and another begins. If you place a page break in the group footer, you can be sure that all new groups begin on a new page.

To add a group band

- With a report open in the Design Window, click Insert, Group Band.

Paradox places the first group band between the page band and the record band. When you place more group bands, Paradox places them closest to the record band.

To define a group band

- 1 With a report open in the Design Window, right-click a group band and click Define Group.
- 2 In the Define Group dialog box, enable one of the following:
 - Group By Field Value—specifies the table, fields, and range for the group.
 - Group By Record—specifies the number of records you want to appear in each group.



- You cannot add a group band to reports that have a data model that contains dBASE tables.
- You can rearrange group bands by dragging them with the mouse.

Grouping by a field value, number of records, or range

If you group the records of your report based on the value of a field, you can arrange the data into meaningful sets. For example, you can view your customers grouped by their country or state, view orders grouped by a method of payment or shipment, or view stock items grouped by equipment classification. You can also group the report into sets of records by defining a number to specify the set you want. This is useful if you want to group records for easy viewing without sorting them in any particular way.

To group by a field value

- 1 With a report open in the Design Window, click Insert, Group Band to add a group band to the report.
- 2 In the Define Group dialog box, choose the value of a field, a range of values, or a specified number of records by which to group.

Paradox places a field object for the field by which you are grouping in the header of the new group. You can delete this field.

To group by a number of records

- 1 With a report open in the Design Window, right-click the band and click Define Group.
- 2 In the Define Group dialog box, enable Group By Record.
- 3 In the Number Of Records box, type the number of records you want in each group.

To group by a range

- 1 With the report open in the Define Group dialog box, right-click the group and click Define Group.
- 2 In the Define Group dialog box, choose the field you want from the Field box.

Paradox shows the master table, any table linked to it in a one-to-one relationship in the Table list, and all available fields in the Field list.

Because you cannot create a group on a Binary Large Object (BLOB) field, Paradox doesn't show them in the Field list.

- 3 Enable the Range Group check box.

The interval of the range depends on the data type of the field.



- When you group by the value of a field, you apply a sorting specification to your data. If, for example, you group on the Country field of the Customer table, the records from Customer appear in the report sorted by the values in their Country field.
- You cannot place a field group band within a range group band.
- If you do not specify a range, a new group begins every time the field value changes.



- You can place two group bands on a report to use a field or range grouping in combination with a grouping by a number of records.

Rearranging group bands

If your report has multiple group bands, you can rearrange their order. If you move a band, the order of the grouping changes.

To rearrange group bands

- With a report open in the Design Window, select the band and drag it to its new location.



- You can drag from anywhere within the band. With the band selected, you can also use the Up and Down arrow keys to move the band.
- You cannot group by a field within a range group.

Specifying the sort order for a group

You can sort records in ascending or descending order.

To specify the sort order for a group

- 1 With the report open in the Design Window, right-click a group band and click Properties.
- 2 On the General page of the Properties dialog box, enable one of the following buttons in the Sort Order section:
 - Ascending—prints the groups in either A to Z or numeric order.
 - Descending—prints the groups in either Z to A or reverse numeric order.

Suppressing repeated group values

When you group records on a field value, Paradox usually prints that field value in every record although it is the same throughout the group. You can suppress repeated field values that a group is based on by enabling the Remove Group Repeats property for the report.

The following example shows a report for the sample Orders table that has a group defined on the Customer No field. Remove Group Repeats is checked. As you can see, only the first record in each group actually shows the customer number.

Enabling the Remove Group Repeats property omits unnecessary values, resulting in a more organized report.

Order No	Customer No	Sale Date	Ship Date
1,001.00	1,221.00	4/3/91	4/5/91
1,023.00		7/1/91	7/5/91
1,059.00		2/24/92	3/1/92
1,076.00		4/24/92	4/26/92
1,123.00		10/1/92	10/7/92
1,169.00		7/4/93	7/12/93
1,176.00		7/24/93	7/26/93
1,269.00		4/4/94	4/4/94
1,369.00		12/4/94	12/11/94
1,469.00	1,221.00	4/5/95	4/6/95

To suppress repeated group values

- With a report open in the Design Window, click Format, Properties. On the General page of the Properties dialog box, enable the Remove Group Repeats check box.



- When Remove Group Repeats is disabled, Paradox displays the value of the grouped field for each record, including duplicates, in the record band. When Remove Group Repeats is enabled, Paradox only prints the value for the first record of the group.

Setting printing preferences for group headers

You can print a group header either at the beginning of each group or at the top of the page when the group continues across a page break.

You can print a specific object in a report's group header at the beginning of each group, at the top of the page when the group continues across a page break, or both. These options are available for field objects, records in a table frame, or records in a multi-record object.

To set printing preferences for group headers

- 1 With a report open in the Design Window, right-click a group band and click Properties.
- 2 On the General page of the Properties dialog box, enable one of the following check boxes:
 - On Page And Group—prints the group heading at the beginning of each group and at the top of a page when the group is continued across page breaks.
 - On Group Only—prints the group heading at the beginning of each group, but not at the top of a page when the group is continued across page breaks.

To set printing preferences for objects in group headers

- 1 With a report open in the Design Window, right-click an object and click Properties.
- 2 On the Run Time page of the Properties dialog box, enable one of the following check boxes:

- **Print At Group**—displays the object at the beginning of each group but not at the top of each page (unless a group begins at the top of the page).
- **Print At Page**—displays the object at the top of the page whenever a group breaks across pages. The object never appears on the first page of the report.



- The header property affects the entire group band. To control how a specific object prints, use its conditional property.
 - The conditional property affects only the specified object. To control how an entire group band prints, use its header property.
-

Page breaks

In order to insert or delete page breaks in a report you need to use the sidebar. The sidebar is located between the ruler and the window's frame on the left side of the Report Design Window.

Inserting, moving, or removing a page break in a report

You need to display the sidebar in order to add or remove page breaks. When you add a page break, follow these rules:

- You can place a page break in any band except the page band.
- A page break cannot cross an object in a band. It must fall either above or below any existing objects.

To display the sidebar

- With a report open in the Design Window, click View, Ruler.

You can use the sidebar to view the selected band and to insert, move, or delete page breaks.

- 1) Side bar
- 2) Page Break



To insert a page break in a report

In the Report Design Window, do one of the following:



- Click Insert *Page Break* then click in the document where you want the page break to appear.
- Click in the sidebar where you want the page break to appear.

A line appears across your document, and a page break marker appears in the sidebar.

To move a page break

- 1 Move the mouse cursor over the page break. The cursor changes to a vertical double-headed arrow.
- 2 Drag the page break marker to a new location.

To delete a page break

Do one of the following:

- Click the page break in the sidebar, and drag the marker out of the sidebar.
- Move the mouse cursor over the page break (the cursor changes to a vertical double-headed arrow), and press DELETE.

Expanded and pushed objects

When you preview or print a report, some objects (such as fields, tables, multi-record objects, and charts) fill with data. This may cause them to grow or shrink.

Tables and multi-record objects expand or contract vertically, to fill as many pages as needed to print all records (unless you have changed the layout or the Show All Records property of the multi-record object).

Fields, when placed individually or as part of a table or multi-record object, expand or contract horizontally to display all the data they contain (unless Word Wrap is enabled on the object's Text Property page). Fields that expand in tables and multi-record objects cause the whole table or multi-record object to expand with them. Fields in which Word Wrap is enabled are fixed in width and expand vertically. Even if they contain less data than a single line, they remain fixed in width.

Objects that contain tables, multi-record objects, or fields can grow as the contained objects grow. If the objects are scrollable, they expand to show all the contents (for example, graphic objects, record objects, and text objects).

When Size To Fit is set, objects on which you can place scroll bars in forms expand to their full size in reports.

How expanding objects push and pull surrounding objects

When objects expand, they push surrounding objects, and maintain the spacing between them. When they contract (when there is too little data to fill the object) they pull in surrounding objects. Vertically expanding objects push other objects down the page. Horizontally expanding objects push other objects across the page to the right.

Changing how objects expand and push

When you work with objects that expand and contract, you can use several properties to control run time behavior. You can prevent an object from expanding or contracting by setting its Fit Width and Fit Height properties. See "Preventing expanding and contracting when running a report" on page 270. You can prevent an object from being pushed or pulled by setting its Pin Horizontal and Pin Vertical properties. See "Pinning design objects at run time" on page 271.

Run time errors

If the records in your table or multi-record object contain too much data (are too big) to fit on a page, a run time error occurs. If you make the records fixed size (Fit Height disabled) they will clip the data but not generate an error. If you do not want clipping, enable the Breakable property of the record as well as the table frame or multi-record object in which it is contained.



- Multi-record objects often cannot be broken; therefore, you are forced to clip the data. You could design the report using a different approach: instead of placing small objects and letting them grow, you could make objects as large as they are allowed to be, and make it impossible for them to shrink. However, you may end up wasting a lot of paper just to print a report containing a few large records that cause clipping.

Controlling pushed objects with lines

To maintain the alignment of multiple objects on a report as they are pushed or pulled by expanding or contracting objects, draw a line between the expanding or contracting object and the objects that are being pushed or pulled. The expanding or contracting object pushes or pulls the line, which subsequently pushes or pulls all the objects to maintain their alignment with each other.

To hide a line used to control pushed objects

- 1 Right-click the line and click Properties.
- 2 On the Run Time page of the Properties dialog box, disable the Visible check box.

You will be able to see the line when you design the report but not when you view or print the data.



- Use invisible boxes to surround several objects that you want to keep together on a page. If the box is unbreakable, the objects push to the next page rather than splitting over two pages.

Preventing expanding and contracting when running a report

When you preview or print a report, some objects fill with data. This may cause them to grow or shrink. As objects resize, they push or pull other objects on the page. You can prevent the automatic resizing of these objects (and of objects that contain such objects).

To prevent expanding and contracting when you run a report

- 1 With a report open in the Design Window, right-click the object and click Properties.

- 2 On the Run Time page of the Properties dialog box, disable the Fit Width and Fit Height check boxes.

When these properties are disabled, the objects retain their size and shape when printed or previewed. Paradox trims data that are too large to fit inside the objects.

Pinning design objects at run time

When you preview or print a report, some objects fill with data. This may cause the objects to grow or shrink. As objects resize, they push or pull other objects on the page. You can prevent an object from being pushed or pulled.

To pin design objects at run time

- 1 With a report open in the Design Window, right-click the object and click Properties.
- 2 On the Run Time page of the Properties dialog box, do one or both of the following:
 - Enable the Pin Horizontal check box to prevent the object from moving back and forth.
 - Enable the Pin Vertical check box to prevent the object from moving up or down.



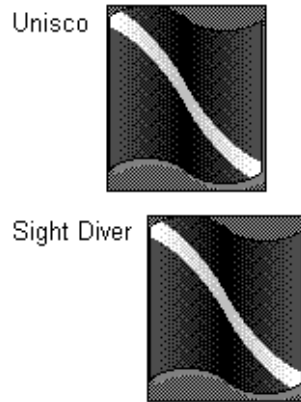
- An object that expands can obscure a pinned object.
-

Example of preventing pushing and pulling

When you preview or print a report, some objects fill with data. This may cause the objects to grow or shrink. As objects resize, they push or pull other objects on the page.

For example, suppose you place the Name field from Customer in a report. When you are working in the Report Design Window, the field object is always the same size. When you run the report, the values displayed in the field object differ in size and, by default, the field object grows or shrinks to fit the data.

Now suppose you have a graphic object to the right of the Name field. The following figure shows how the graphic can be pushed or pulled by the Name field.

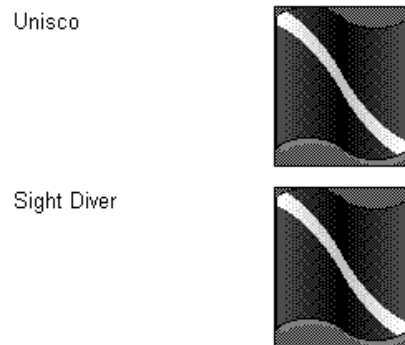


The size of the data in the Name field causes the field object to expand or contract. When the field expands, it pushes the graphic to the right. When it contracts, it pulls the graphic to the left.

You can do one of two things to prevent the movement of the graphic due to the pushing or pulling of other objects.

- Select both the field and the graphic and click Format, Group.
- Right-click the graphic object, click Properties. On the Run Time page of the Properties dialog box, enable the Pin Horizontal check box.

The following figure shows how the pinning of the graphic at run time affects the report.



When you enable Pin Horizontal, the size of the data in the Name field does not affect the graphic. Because it is pinned, the graphic is neither pushed nor pulled as the data changes.

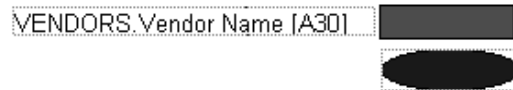
One possible consequence of pinning an object, which might otherwise be pushed, is that an object that expands can obscure a pinned object.

Example of invisible lines aligning pushed objects

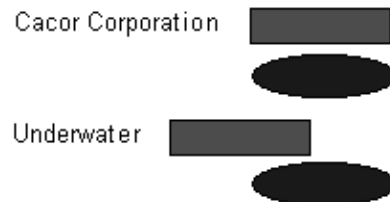
When you preview or print a report, some objects fill with data. This may cause the objects to grow or shrink. As objects resize, they push or pull other objects on the page.

Suppose you align objects in the Report Design Window and find that one of them is pushed by another object when you run the report. You can use invisible lines or boxes to group and control the alignment of multiple pushed objects, or you can select the objects and group them by clicking Format, Group.

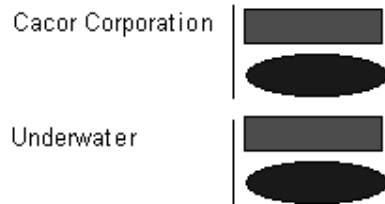
For example, suppose you had objects like this on the report design:



When you run the report, the Vendor Name field pushes or pulls the box, but not the ellipse.



If you place a vertical line between the field and the other two objects, the field that expands pushes the line, which subsequently pushes both objects.



If you don't want to see the line, right-click the line and click Properties. On the Run Time page of the Properties dialog box, enable the Invisible check box.

You can achieve the same results by grouping the box and the ellipse so they move together.



- You can accomplish the same results by grouping the pushed objects by selecting the objects and clicking Format, Group. Right-click the group and click Properties and disable the Breakable check box on the Run Time page of the Properties dialog box.

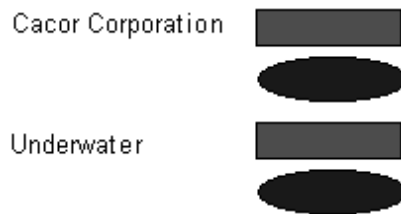
Example of a container keeping objects together

When you preview or print a report, some objects fill with data. This may cause the objects to grow or shrink. As objects resize, they push or pull other objects on the page.

You can use a container to keep a group of objects on the same page. For example, suppose you have the following report design.



The objects are surrounded by an invisible container object (box). On the Run Time page of the Properties dialog box, the container's Breakable property is disabled. Therefore, the objects stay together on a page in Run mode.



It's possible, whether you use a line or a box to control the horizontal movement of the box and ellipse, that Paradox could separate the box from the ellipse at a page break. This happens if you use a line to align the objects or you use a box for which the Breakable check box is enabled in the Run Time page of the Properties dialog box.

To prevent a group of objects from becoming separated at a page break, you must surround them with a box disabled on the Run Time page of the Properties dialog box.



- You can accomplish the same results by selecting the objects and clicking Format, Group. Select the group and click Properties. On the Run Time page of the Properties dialog box, disable the Breakable check box.

Delivering a report

Delivery gives you a way to let others use your report, but not change the design or source code. A delivered report cannot be opened in a Design Window, and therefore cannot be changed.

When others use your report, they must also have access to all tables in the data model, along with any indexes and referential integrity files. The easiest way to make a set of tables, forms, and related files portable is to use an alias.

When you design a report for others to use, consider the screen display with which users will view the report. It's best to use standard color and font choices, as well as standard sizes for form windows, to ensure the usability of the finished report.

Delivering a report

When you deliver a report, Paradox creates a copy of the report with all source code removed. Buttons and other objects still work exactly the way you designed them.

To deliver a report

- With a report open in the Design Window, click Format, Deliver.

Paradox saves a copy of the report with an .RDL extension. The D stands for delivered.



- You can still change the original report (the one with the .RSL extension), and then deliver the report again. Your code is not lost — it's protected.
-

Report and band properties

The report, as a whole, has properties that can be changed. These include

- Scroll bars
- Size to fit
- Standard menu
- Controlling group repeats

All bands except page bands have run time Breakable and Shrinkable properties.

- Breakable means that if the contents of the band don't fit on one page, Paradox can divide them across pages.
- Shrinkable means that if the contents of the band will fit on the page, but the band itself is too big to fit (including white space), Paradox can discard white space below the bottom object in a band to make the band fit on the page.

Changing report and band properties

Use the Properties dialog box to alter a report's or band's properties.

To change a report's properties

- 1 With a report open in the Design Window, and click Format, Properties.
- 2 Change the properties on the General and Pattern pages.

To change a band's properties

- Right-click the band or the band label and click Properties.
Paradox displays the property choices for the band.

To change a band's properties using the keyboard

- 1 Use Tab to select the band you want.
- 2 Press F6 to display the band's menu.

Using reports

Reports are printing tools that allow you to format and print your data. Since they cannot be used to change the data that exists in a table, they should be designed simply to display data in a variety of ways. You can also use a report to display the data that exists in another table.

Previewing reports

Previewing (running) a report shows what the printed report will look like when it contains data. Whether the report is in Run mode or Design mode, you cannot enter or edit data in a report.

Previewing (running) a report

In the Report Design Window, you view a report's design. To view the report's data, you must run the report. Paradox can automatically size the Report window to fit the design.

To preview (run) a report

- In the Report Design Window, click View, Run Report.

Paradox displays the report in the Report window. Navigation buttons appear on the Toolbar. Click the buttons to move among pages of the report. To return to the Report Design Window, click View, Design Report.

To size the Report window to fit the report's design

- 1 Open a report in the Design Window and click Format, Properties.
- 2 On the General page of the Properties dialog box, enable the Size To Fit check box.



- To speed up the preview of a report, right-click an object and click Properties; on the Run Time page, disable both the Fit Height and Fit Width check boxes.
 - Press F8 to toggle between Run Report and Design Report.
-

Displaying a custom menu when previewing a report

Paradox displays the standard menu in the Report window when you preview a report. If you create a custom menu using ObjectPAL your report can use that custom menu at run time.

To display a custom menu when previewing a report

- 1 Click View, Design report to open the report in the Design Window.
- 2 Click Format, Properties.
- 3 On the General page of the Properties dialog box, disable the Standard Menu check box.

The standard menu is enabled by default.

Using a report with a different table

Suppose you design a report and like the layout, colors, and other attributes so much that you want to display the data from another form in the same style. Instead of recreating the report on the new table, you can open the report using the new table. This feature also allows you to use an existing report layout to print or view the Answer table of a query.

The following rules apply when you use a report with a different table:

- The master table is the only table that can be changed.
- If the original table and the new table have identical field names and table structures, Paradox automatically rebinds the fields in the report to the new table.
- If the report contains field objects that cannot be rebound to the new table (because there is no corresponding field in the new table), Paradox displays those field objects as undefined.
- If the report has calculated fields that reference missing fields, the calculated fields will have invalid expressions and must be redefined with the new table. Edit the calculated expression, remove all field references to the original table, and replace those field references with fields from the new table.
- Do not use the data model to change the table being used with the report. Although it is possible to add a new table to the data model and to delete the original table from the data model, this causes all fields in the report to display as undefined, or to be removed, along with any group bands defined from the deleted tables.



- You can use the data model to change the table used with the report by using table aliases. Paradox then knows you want both tables to represent the same thing. For more information on table aliases see “Aliases” on page 46.
-

Printing or viewing a report using a different table

You can open a report created on one table by using the data from another table or from a saved query or saved Structured Query Language (SQL) file.

To print or view a report using a different table

- 1 Click File, Open, Report.
- 2 In the Open Report dialog box, select the appropriate report.
- 3 Click Change Table.
- 4 In the Select Replacement Table dialog box, select the table, saved query, or saved Structured Query Language (SQL) file to use in the report.
- 5 Click OK to Return to the Open Report dialog box.

- 6 Enable one of the following buttons:
 - View The Report—displays the report.
 - Print the Report—prints the report.
- 7 Click Open.



- If a field in the report does not have a corresponding field in the table, Paradox warns you. Paradox opens the report. Any undefined fields are given the name LABEL, and no data appear in them.
- To redefine undefined fields, click View, Design report to return to the Design Window where you can define the fields. To keep the original report intact, save the new report with a different name. Return to the Design Window and click File, Save As. Give the report a new name. (You cannot do this if your document is a delivered report.)

Printing reports

Paradox allows you several printing options for reports. You can print the report with its data, or you can simply print the report's design. You can also print to a file so that you can take the file to a printing service, or translate the form to HTML so that you can publish the report to the web.

Printing a report

You can print the report with its data, or just the report's design. When you run a report on shared data, you run the risk of reporting on changing data. For example, if you print a report on the Customer table while another user is editing the table, your report might be out of date by the time it prints.

To print a report

- 1 Do one of the following:
 - In the Report window, click File, Print.
 - In the Report Design Window, click File, Print, Report.
- 2 In the Print dialog box, choose the pages to print, the number of copies to print, and whether to collate multiple copies.
- 3 In the Overflow Handling options area, specify how to treat data that are too wide to fit on the printed page. For more information, click Help in the Print File dialog box.

To print a report's design

- With a report open in the Design Window, click File, Print, Design.

To print a report when another user is changing the data

- In the Report Design Window, click Report, Restart Options.

Paradox opens the Restart Options dialog box.



- The report's page layout affects how the report prints.
 - If you designed the report for the screen, the fonts that appear on the printed output might not match those that you see onscreen. This depends on whether your screen fonts and printer fonts match.
-

Printing to a file

Sometimes, you might want to print the report to a file so you can take it to a printing service or transfer it to another computer. To print a report to a file, you must add a printer through the Windows Control Panel and set its output to a file. Select that printer as the active printer before you print your report.

You can click File, Write As Text File to print a report to a text file.

You can click File, HTML Publish to publish a table or report as a static or dynamic HTML file.

To print to a file

- 1 With a report open, click File, Printer Setup.
- 2 Use the Printer Setup dialog box to choose the appropriate printer.
- 3 Enable Print To File.
- 4 Type a name for the file in the Print To File box.
- 5 Click Print.

Each time you print a report, you can choose which printer to use from the Printer Setup dialog box. Whatever printer was last selected is the current printer.

To add a printer for printing to a file

- 1 Open the Windows Control Panel. (See your Windows Help for more information.)
- 2 Open the Printers folder and double-click Add Printer.
- 3 Use the Add Printer wizard to install a new printer using an existing printer driver.
- 4 Do one of the following:
 - If you want the file to print as text-only (no formatting), click the Generic/Text Only printer. (Don't worry if the report looks incorrect onscreen — it will print correctly to a file. You can prevent this by designing the report for the screen.)
 - If you want the file to print with formatting, choose a graphics printer driver, such as a PostScript printer.
- 5 Choose File as the port to use for the active printer, then complete the wizard as directed.

To write a report to a text file

- 1 With a report open, click File, Write As Text File.
- 2 In the Save File As dialog box, type the full path and new filename in the File Name box.
- 3 Click Save.

Publishing reports

Paradox lets you publish your report to a variety of file formats, including Text (.TXT), WordPerfect (WPD), Microsoft Word (.DOC), Rich Text Format (RTF), and HTML.

To publish a report

- 1 Click File, Open, Report.
- 2 Double-click the report you want to open.

- 3 Click File, Publish As, and choose one of the following:
 - TEXT
 - RTF
 - HTML
 - WPD
 - DOC
- 4 Choose the drive where you want to save the file from the Save In list box.
- 5 Double-click the folder in which you want to save the file.
- 6 Type the file name in the File Name box.



CHARTS AND CROSSTABS

6

Paradox allows you to place charts and crosstabs in your forms and reports. By exposing hidden data, charts and crosstabs help you to analyze your data. Using a chart or crosstab in your forms and reports enables you to

- break data into categories you specify
- summarize the data within those categories
- sort the summarized information

For example, when you break down a company's sales data by year and quarter, you can study trends. Break the data down further by product type and regional sales, and your analysis becomes more sophisticated.

Queries behind charts and crosstabs

The summarized data for a chart or crosstab is created by a query. Crosstabs automatically create and run queries; therefore, defining a query is not part of creating a crosstab.

Working with charts

Charts can show you the overall view of your data. They can reveal trends and patterns and show how different parts contribute to a whole. You can use charts to draw conclusions quickly and to see relationships in your data that you might otherwise miss. You can also view different types of charts as you work with your data.

Charts must be in a form or a report. Each chart is based on the tables in the data model of the form or report.

When you create a chart, Paradox first cross-tabulates the data before generating the chart. Understanding crosstabs might help you work with charts.

Chart basics

Use a chart to analyze the following types of data:

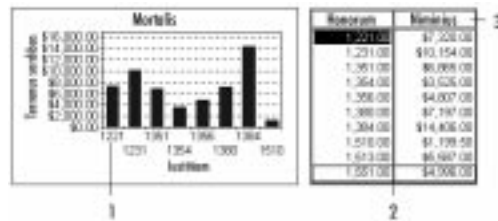
Tabular (no categories)

Paradox's default (and most simple) chart type is tabular. Because a tabular chart displays data without summarizing it, there is no crosstab equivalent. For a tabular chart, you can specify either one field for x-axis values or multiple fields for the y-axis. Each represents a series of values plotted as a group on the chart.

A tabular chart measures the values in one numeric field within each category represented by the values in another field. These values are unique only if the x-value field is a key field. To make x-values unique when the field is not a key field, choose a one-dimensional summary chart.

The following example shows a tabular chart created on the sample Orders table. When both the chart and a table frame are in a form, you can move through the table's records and the chart updates to reflect the current record. For example, if you move past the Customer No 1510 in the table frame, the chart updates to show the next set of records.

- 1) The current record
- 2) The chart updates to show the next set of records.
- 3) Data from the Orders table.



One-dimensional (1-D) summary (one category)

A 1-D chart has one category. A 1-D summary chart differs from a tabular chart because Paradox lets you choose a summary operation to define the y-axis values. It also guarantees that x-values are unique.

Two-dimensional (2-D) summary (two categories)

A 2-D summary chart categorizes, or groups the summary data being charted by the unique values of two fields. The data is grouped by the x axis values.

Multi-table charts

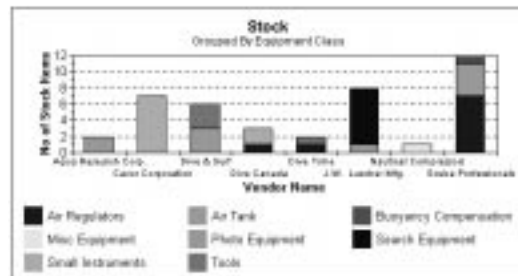
If you want to analyze (cross-tabulate) data contained in two or more tables, the tables must be linked.

A chart can draw information from any number of tables that are linked in a single-value (one → one or many → one) relationship. For example, if you want to view the number of items in stock by equipment class and the vendor that supplies them, you can link the Stock and Vendors tables. You can then define the x-axis, y-axis, and summary data using any field from either table.

To create the table relationship, use the Data Model dialog box to create a data model that links the tables. When you place a chart in a form or report, the chart uses the data model of that design document.

You can combine fields from linked tables in the same chart only if the link is a single-value (one-to-one) relationship. You cannot chart information from combined fields of tables linked in multi-value (one → many) relationships. You can chart information from the detail table only in a one → many relationship.

.....
An example of a 2-D
summary chart.
.....



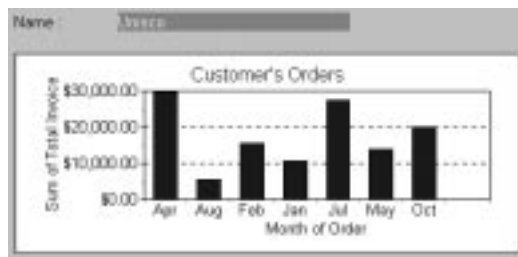
The chart is grouped by values in the Equipment Class field of the Stock table. The x-axis is defined as the Vendor Name field of the Vendors table. The y-axis is defined as a count of the Stock No field from the Stock table. The legend shows the colors and patterns that represent each equipment class value in the chart.



- Fields used in the y-axis must be numeric.

Charts of detail tables

Suppose you have a linked multi-value (one → many) relationship and you want to see a summary chart of only those records in the detail table that apply to a record of the master table. For example, you might want to define a chart of the Orders detail table that sums the Total Invoice field by month for each customer, as shown in the following figure:



In the relationship between the Customer and Orders tables, each customer can have many orders. You can link the two tables and create a chart on the detail table, Orders. You can then place the Customer No or Name field (or both) from the master table, Customer, on the page.

Paradox knows from the data model that the information in the chart applies only to the current record of the master table. In this example, the Name field at the top comes from the Customer table. As you scroll through Customer, the chart is updated to show each customer's order information.

Creating a chart on a form or report

Place a chart on a form or report using the chart tool. You can create the chart to any size.

To place a chart in a form or report



- 1 Open a form or report in the Design window, click the *Chart tool*.
- 2 Drag the area of the form or report where you want to place the chart.
An empty tabular chart object appears with undefined x-axis, y-axis, and charted data.
- 3 Drag the sizing handles to resize the chart.



- In a report, the scope of a chart is determined in part by the section of the report in which it is placed.

Defining a chart

Tabular charts take their data directly from a table, rather than summarizing the data in the table.

1-D Summary charts analyze one data type in relation to another.

2-D Summary charts summarize information by more than one category.

When you place a new chart object in a form or report, undefined data series appear in the chart's x-axis. A data series is one row or column of data in a group used to draw one or more objects on a chart (such as the bars or boxes used to indicate the data points on the chart). You must define this series to create a chart.

Defining a chart

You cannot use the same field for x-axis values and y-value data. If you have already chosen a field to supply the x-axis values — or additional grouping values, or are creating a 2-D summary chart — that field is dimmed. For more information, see “Changing a chart's y-axis” on page 294.

To define a chart

- 1 Right-click the chart, and click Define Chart.
- 2 In the Data Type panel, enable one of the following (for more information see “Chart basics” on page 286):
 - Tabular.
 - 1-D Summary.
 - 2-D Summary.
- 3 Choose from the table list box the field that contains the values you want to use for x-axis values.
- 4 Choose from the table list box the field that contains the values you want charted according to the y-axis measure.
- 5 Define a field by which to group your data if you enabled the 2-D summary.



- You can customize the chart by formatting the series, specifying titles, and changing the properties of different areas of the chart.

Defining a series

When you place a new chart object in a form or report, undefined data series appear in the chart's x-axis. You can define the series and format their display.

If you have more than one series of data in your chart, you can format them differently. For example, in a chart that shows two lines of data, you may want the bars of one series red and the other series blue. In particular, you can choose Type Override with some chart types to make one series a different type from the rest. For example, in a two-dimensional (2-D) Bar chart you might make one series a 2-D Line.

Use the right-click menu to define the color, pattern and style of the background and data points (for example, bars, boxes, or circles) of the chart. You can also use the right-click menu to redefine the Y-value for the series.

To define a series

- Open a form or report in the Design window, right-click a data point (for example, a bar or box) in the chart and click the appropriate menu selection.



- When the data type of the chart is tabular or one-dimensional (1-D) summary, you can add more series to the original undefined series by choosing additional fields for Define Y-Value.
- When the data type of the chart is 2-D summary, you can choose only one field for the single series allowed for this data type.

Specifying an additional group field in a 2-D summary chart

For 2-D summary charts, you can choose any of the available and valid fields by which to group the summary data. The data is also grouped by the x-axis categories.

Specifying an additional group field is like having a secondary x-axis. For example, a chart might show sales by quarter. The quarters are listed along the x-axis and sales along the y-axis. You could break the data down, for example, to show sales by quarter and, within each quarter, sales by product. In this new chart, the x-axis and y-axis would be the same, but each point on

the x-axis would have multiple summaries — one for each product. The legend shows how each product summary is represented in the chart.

By default, Paradox displays 8 groups (series) in a 2-D summary chart. You can control the number of groups displayed. For example, if your data has too many groups to display clearly, you might want to see only the first few groups.

To specify an additional group field in a 2-D summary chart

- 1 Open a form or report in the Design window, right-click the upper-left hand corner of the chart and click Define Chart.
- 2 Enable the 2-D Summary button in the Define Chart dialog box.
- 3 Enable the Grouped By button.
- 4 Choose the field by which you want to group the summary data from a table's list box.

You cannot choose the same field for x-axis values, y-value data, and an additional grouping. If you have already chosen fields from this table to supply the x-axis value and the y-axis data, those fields are dimmed.

To control the number of groups (series) a that 2-D summary chart displays

- 1 Open a form or report in the Design window, right-click the 2-D summary chart and click Max Groups.
- 2 Choose a number from the list, or click the ellipsis (...) at the top of the list to open a dialog box, and type a higher number.



- You can also define a group by right-clicking the chart's title and clicking Define Group.
-

Modifying a chart

Chart properties

A chart object has many parts. Each part of the chart object has a unique property menu in addition to the property menu of the chart as a whole. Right-click a corner of the chart to select the chart as a whole, or right-click an area of the chart to select that area. Click Properties to display the property pages. To change other aspects of the chart, click an item from the right-click menu:

Menu Item	Description
Properties	Displays the Properties dialog box with tabbed pages for changing properties. These include the standard Color, Pattern, Frame, Design, and Run Time properties used by other design objects. For Help on these property pages, select them and press F1.
Object Explorer	Displays the Object Explorer for editing ObjectPAL methods, events, and object properties (forms only).
Define Chart	Displays the Define Chart dialog box, where you can choose the fields for each axis of the chart as well as the data type of the chart.
Data Type	Specifies Tabular, 1-D Summary, or 2-D Summary.
Chart Type	Displays a listing of 2-D and 3-D chart types.
Max Groups	Controls the number of groups (series) a 2-D Summary chart displays.
Min x-values	Sets the minimum number of chart series.
Max x-values	Sets the maximum number of chart series.
Options	Customizes the chart using these options: Show Title—toggles the display of the title on and off. On by default Show Legend—toggles the legend on and off. Off by default Show Grid—toggles the display of the grid on and off. On by default Show Axes—toggles the display of axes on and off. On by default Show Labels—toggles the display of labels on and off. Off by default Rotation—turns a chart around its vertical axis by the number of degrees you choose. This option is available for all 3-D charts except 3-D Pie and 3-D Columns Elevation—changes the angle from which you view a 3-D chart. This option is available for all 3-D charts except 3-D Pie and 3-D Columns



- See the Object property reference in the online help for more information on specific chart properties.

Chart area properties

You can change properties of each area of a chart. When the pointer changes to a small vertical arrow, right-click to see a list of properties for that area.

For the areas of X-Axis, Y-Axis, and Grouped By, you can specify field, scale, grid, ticks, and title. In a 2-D summary chart. You can also define the group by right-clicking the chart title and clicking Properties.

You can set the following options for series labels:

Property	Description
Define Y-Value	Specifies the field whose values you want to chart on the y-axis. You can also click the top of the list to open the Define Field Object dialog box, where you can choose a field from another table in the data model. You can specify more than one y-value if you right-click the y-axis area instead of just a series.
Title	Specifies Text and Font or Use Default.
Color	Displays the standard Paradox Color palette.
Pattern	Changes the color and style of the pattern.
Remove This Y-Value	Removes a series from a chart. The field is also removed from the Y-Value fields list in the Define Chart dialog box. This option is available with Tabular and I-D Summary data types.
Type Override	Changes the selected series to a different display type from the rest of the chart. Choose None, 2-D Bar, 2-D Line, or 2-D Area. Type Override is available for any 2-D Bar, 2-D Line, 2-D Area, or 2-D Rotated Bar chart.

Changing a chart's type or data type

A wide variety of chart types, such as bar, area, line and pie charts, are available.

Changing the data type causes the chart object to change. The choices on the object's property pages also change according to data type.

To change a chart's type

- 1 Open a form or report in the Design window, right-click the upper-left corner of the chart and click Chart Type.
- 2 Choose a chart type from the list.

To change a chart's data type

- 1 Open a form or report in the Design window, right-click the upper left corner of the chart and click Data Type.
- 2 In the Data Type panel of the Define Chart dialog box, enable one of the following:
 - Tabular
 - One-dimensional (1-D) Summary
 - Two-dimensional (2-D) Summary



- For more information on data types, see “Chart basics” on page 286.

Changing a chart's x-axis

As well as deciding what data to use for your chart's x-axis, you can also decide the minimum and maximum x-axis values, and the scale used for the x-axis.

To change a chart's x-axis

- 1 Open a form or report in the Design window, right-click the chart's X-axis and click Define X-Value.
- 2 Choose a field from a table's list box.

To choose the minimum and maximum number of values to include in the x-axis

- Right-click the upper-left corner of the chart and choose Min X-Values or Max X-Values. Choose a number, or click the ellipsis (...) at the top of the menu to specify your own values.

To format the x-axis title and ticks (and scale for XY charts)

Right-click the area around the x-axis and click one or more of the following:

- Click Title and Text or Font to specify the text or font typeface, size, style, color, or script.
- Click Ticks to specify the number format, font typeface, style, color or script of the tick marks and numbers along the x-axis.
- Click Scale to specify the type of scale you want to use (for example, logarithmic).

Changing a chart's y-axis

With a tabular chart, you can only choose numeric fields for the y-value. Fields that are not numeric are dimmed.

With a 1-D summary chart, you can choose any available and valid field(s) to define the y-axis. When you choose a y-axis field, Paradox couples it with a default summary operation. By default, Paradox

- sums number, money, short integer, long integer, autoincrement, and Binary Coded Decimal (BCD) field data
- counts alpha, date, time, timestamp, or logical field data

These default summary operations appear in the Summary list box of the Define Chart dialog box when you highlight each field in the Summaries panel.

With a 2-D summary chart, you can choose any one of the available and valid fields to define the y-axis. When you choose the y-axis field, Paradox couples it with a default summary operation.

To change a chart's y-axis

- 1 Open a form or report in the Design window, right-click the chart's y-axis or an individual series, click Define Y-Value.
- 2 In the Define Field Object dialog box, choose a field(s) for the y-axis from the a list box.

To format the y-axis title, scale, and ticks

Right-click the y-axis area and click one or more of the following:

- Click Title and Text or Font to specify the text or font typeface, size, style, color, or script.
- Click Ticks to specify the number format, font typeface, style, color, or script of the tick marks and numbers along the X-axis
- Click Scale to specify the type of scale you want to use (for example, logarithmic).

Changing the order of y-value fields on a chart

With tabular and one-dimensional (1-D) summary charts, you can choose more than one field to define the y-axis. These fields appear in the order you choose them in the Define Chart dialog box. Their order determines the order of the data series in the chart: the first field's values will be the first series, the second field's values will be the second series, and so on.

To change the order of y-value fields on a chart

- 1 Open a form or report in the Design window, right-click the upper-left corner of the chart and click Define Chart.
- 2 Use the Change Order arrows at the bottom of the Field Used In area to change the order; these arrows become active when you define a tabular or 1-D summary chart, when you select a Y-Value , and when you have more than one field in the Y-Value box.

Changing a chart's z-axis

Most three dimensional (3-D) chart types, (except pie charts) have a third axis, called the z-axis. The z-axis is along the third dimension of the chart. Depending on the specific chart type, the labels for the z-axes can either be next to the chart or displayed in the legend under the chart.

To change the z-axis font properties

- Right-click the z-axis on a 3-D chart to change the Font used in its label.

Changing a chart's title

To compliment your form or report, you can affect the position and appearance of the chart's title.

To change a chart's title

- With a form or report open in the Design window, right-click the title area of the chart and click Title to specify the text, font, typeface, size, color, and script of the title.

Removing fields from a chart

You can remove fields from a chart's x-Axis, y-Value, and Grouped By boxes in the Define Chart dialog box.

To remove fields from a chart

- 1 Open a form or report in the Design window, select the chart.
- 2 Right-click the upper-left corner of the chart and click Define Chart.
- 3 In the Define Chart dialog box, select the field you want to remove in the x-Axis, y-Value, or Grouped By boxes.
- 4 Click the Remove Field button.

Changing the appearance of a chart

You can change the way each part of a chart looks; in other words, you can change

- the title's font, color and background pattern
- the data series' color and pattern
- the background's color and pattern
- the frame's style and color

- the axis titles' color and font
- the ticks' color, font and frequency

There are also properties that can be changed which are specific to particular chart types. See the Object property reference for more information on specific area properties.

Changing a chart's fonts

Use the Font palette to specify a chart's typeface, size, and style.

To change a chart's fonts

- 1 Open a form or report in the Design window, right-click a portion of the chart that has text (like the title or an axis) and click Title, Font.
- 2 Change the typeface, size, style, color, and script of the font.

Changing a chart's background

The chart's background is the area not being filled with data, for example above and between the columns in a tabular chart. You can change the background's color, pattern, and pattern color.

To change a chart's background color

- 1 Open a form or report in the Design window, select the chart.
- 2 Right-click the background area, click Color, and then click a color from the palette.

To change a chart's background pattern

- 1 Open a form or report in the Design window, select the chart.
- 2 Right-click one of the following:
 - The background area, click Pattern, and then click a color from the palette to change the pattern's color.
 - The background area, click Pattern, and then click a style from the palette to change the background pattern.



- To make the chart transparent, select the chart rather than the background; right-click the chart and click Properties. Enable the Transparent check box on the General page of the Properties dialog box.
-

Changing a chart's color and transparency

Use the Color palette on the chart's General page of the Properties box to specify a chart's color and transparency and to create custom colors for the chart.

To change a chart's color and transparency

- 1 Open a form or report in the Design window, right-click the upper-left corner of the chart and click Properties.
- 2 On the General page of the Properties dialog box, click a color on the color palette.
- 3 Enable the Transparent check box to make the chart transparent.

To change the color of an area of a chart

- 1 Right-click the area, click Color
- 2 Click a color on the palette.

Creating custom colors for a chart

Paradox saves custom colors in the Registry, not with the particular document you are working on when you create the color. Therefore, you can create a custom color in one design document and use the color in any other design document.

To create custom colors for a chart

- 1 Open a form or report in the Design window, right-click the upper-left corner of the chart and click Properties.
- 2 On the General page of the Properties dialog box, click one of the blank spaces on the color palette.
- 3 Click the Add Custom Color button.
- 4 In the Custom Color dialog box, choose a color scheme (RGB, HSV, or CMY).
- 5 Drag the sliders to mix a color.
- 6 Click OK to add the custom color to the color palette.

The custom color appears on the color palette and is available for use whenever you change a color.

Working with crosstabs

A crosstab is a data analysis tool that summarizes (cross-tabulates) information according to one or more categories.

A crosstab is a design object, and the categories are fields. The summarized data for a crosstab are created by a query. Because crosstabs automatically create and run queries, it is not necessary to define a query to create a crosstab. It is, however, a way to understand the type of information a crosstab can contain.

A crosstab

- classifies data by one or more categories
- summarizes the data within those categories
- sorts the summarized information
- displays the data in a spreadsheet-like format

The following crosstab was created on the sample Orders table. Terms was selected as the column field, Ship Via as the category, and Total Invoice as the summary field. The crosstab summary region shows the sum of Total Invoice by shipment and terms.

	FOB	Net 30
DHL	\$324,808.10	\$290,850.50
Emery	\$57,926.35	\$5,029.50
FedEx	\$212,816.45	\$420,095.85
UPS	\$576,386.60	\$525,118.05

As another example, you may know that in your organization, last year's sales totaled \$100 million nationwide. But what if you wanted to know where you should concentrate your advertising dollars? Breaking the information down by region would provide better information on which to base such a decision.

Region	Sales
North	\$25,000,000
South	\$30,000,000

East \$15,000,000

West \$30,000,000

You could break this table down even further to show, for example, how much each product contributed to its region's sales.

SALES

Region	Product #1	Product #2
North	\$12,000,000	\$13,000,000
South	\$10,000,000	\$20,000,000
East	\$10,000,000	\$5,000,000
West	\$15,000,000	\$15,000,000

You can quickly get an in-depth look at your data by using crosstabs.

Crosstab basics

Crosstabs may be one dimensional or two dimensional, and may be based on one or more tables.

One-dimensional crosstabs

When you create a one-dimensional crosstab, you can analyze one type of data in relation to another.

.....
An example of a
crosstab used to
break down order
amounts by payment
method.
.....

Payment Method							
	AmEx	COD	Cash	Check	Credit	MC	Visa
Number of Orders	18	7	15	21	95	34	38

The Orders table has a Payment Method field. The crosstab counts the number of orders placed using each of the seven possible payment methods. In this case, Payment Method is the category of information, and the calculation Count(ORDER.Order No) provides the data for each category.

You can arrange the display of information horizontally or vertically. Paradox can usually calculate and generate a vertical one-dimensional crosstab faster than a horizontal one.

Two-dimensional crosstabs

A two-dimensional crosstab summarizes information by more than one category.

An example of a two-dimensional crosstab.

	AmEx	DD	Cash	Check	Credit	MC	Visa
Apr	5		3	1	10	5	5
Aug		3	3	1	8	2	4
Dec	4			1	3	1	2
Feb			1	3	4	3	
Jan			1		7		2

To create a two-dimensional crosstab, indicate two category fields (the Column and Categories boxes in the Define Crosstab dialog box), and a field whose data you want to summarize (entered in the Summaries box of the Define Crosstab dialog box). In this case, using the Orders table, you could show the count of orders (the summary appearing in the cells of the crosstab object) placed for each payment method and each month (the categories appearing across the top and down the left side of the crosstab object). The data are two-dimensional because they reflect both the month in which the orders were placed and the method used to pay for the orders.

The summary information (count of Order No) appears in the crosstab cells sorted in rows by Month and in columns by Payment Method. To find the number of orders in a given month, you would find the intersection of the appropriate row and column. For example, the number 4 in the first column of cells indicates that four orders were placed in the month of December by customers who used an American Express charge card to pay for the orders. This is a convenient way to analyze the buying habits of customers over time.

Multi-table crosstabs

To analyze (cross-tabulate) data contained in two or more tables, the tables must be linked. A crosstab can draw information from any number of tables that are linked in a single-value (one → one or many → one) relationship. Before you create a multi-table crosstab of a linked one-to-one relationship, you must define the relationship with a data model.

For example, to view the number of items in stock by equipment class and the vendor that supplies them, you can link the Stock and Vendors tables. You're then free to define the rows, columns, and summary fields using any field from either table.

The following figure shows a multi-table crosstab that uses the Vendors Name field from the Vendors table and the Equipment Class field from the Stock table:

	Photo Equipment	Search Equipment	Small Instruments	Tools	Vehicle
Aqua Research Corp.	2				
Cisco Corporation			3		1
Dive & Surf	3			3	
Dive Canada			2		
Dive Time				1	
J.W. Luchow Inc.	1	2			

This figure displays:

- Summary values show how many pieces of each type of stock came from each vendor.
- Row titles show values from the Vendor Name field of the Vendors table.
- Column headings show values from the Equipment Class field of the Stock table.

You can combine fields from linked tables in the same crosstab only if the link is single-valued. You cannot cross-tabulate information from combined fields of tables linked in multi-value (one → many) relationships. You can cross-tabulate information from the detail table only in a one → many relationship.

Crosstabs of detail tables

Suppose you have a linked multi-valued (one-to-many) relationship and you want a summary crosstab of only those records in the detail table that apply to a specific record in the master table.

For example, you might want to define a crosstab in the detail table Orders that sums the Total Invoice field by Payment Method and by Month for each customer in the Customer table.

Name : Kauai Dive Shoppe

	Cash	Check	Credit	Visa
Apr			\$22,402.85	\$8,223.80
Dec			\$5,427.35	
Feb	\$33,540.00			
Jul		\$1,414.00	\$9,471.95	\$4,178.85
May			\$325.00	

In the relationship between the Customer and Orders tables, each customer can have many orders. You can link the two tables and create a crosstab in the detail table, Orders. You can then place the Customer No or Name field (or both) from the master table, Customer, on the form. Paradox knows from the data model that the information in the crosstab applies only to the current record of the master table. In this example, the Name field at the top comes from the Customer table. As you scroll through Customer, the crosstab updates to show each customer's order information.

Creating a crosstab on a form or report

When you create a crosstab in a form or report, the crosstab uses the data model of that form or report.

If you want to see the data from your tables placed in the crosstab you have created, you will have to run the crosstab.

To create a crosstab in a form or report



- 1 Open a form or report in the Design window, click the *Crosstab tool*.
- 2 Click the form or report to create a crosstab at its default size, or click and drag to size the crosstab.

An empty crosstab object appears with undefined fields in the row header, column header, and first summary area.

To run a crosstab

Open a form or report in the Design window, do one of the following:

- Click View, Run Form or View, Run Report.
- Press (F8).



- Paradox runs a query to calculate a crosstab's summary information. The process might fail if the resulting Answer table contains too many fields or if you have inadequate disk space for the query. When the crosstab fails, an empty grid appears in its place.

Saving a crosstab to a table

Once you have created a crosstab on a form, you run the form, then save the crosstab to a table.

To save a crosstab to a table

- 1 Create a crosstab and save the form containing the crosstab.
- 2 Click Edit, Save Crosstab (this menu command is available only when running a form that contains a crosstab.)
- 3 Type the name you want to give to the new table, or select one from the list.

Defining a crosstab

Crosstabs may be based on one or on many tables, and may compare two or more categories of data. The only requirements for crosstabs are that the tables being examined must be in the data model, and that the categories being compared are either linked in the data model or are linked via referential integrity. You define crosstabs using fields from the tables in your data model.

Defining a crosstab

Define the crosstab using fields from the table(s) of the data model of the form or report.

To define a crosstab

- 1 Open a form or report in the Design window, right-click the upper left corner of the crosstab object and click Define Crosstab.
- 2 In the Define Crosstab dialog box, enable the Column button and choose the fields from the table list box that you want to use as column headings across the top of the crosstab.

- 3 Enable the Categories button and choose the field from the table list box that you want to use as row headings down the left column of the crosstab.
- 4 Enable the Summaries button and choose the field from the table list box on which you want to perform a summary operation. This provides the data for the crosstab.



- You can choose more than one field at a time from the tables in the data model. You can also revise the document's Data Model and choose summary operations.
 - The total number of category fields plus the number of columns created for a crosstab cannot exceed 254.
-

Defining the fields of a crosstab

When you place a new crosstab object in a form or report, the first column field, first row field, and first summary field are undefined. You can define or remove the fields used for column headings, row categories, and summaries at any time.

To define the fields for a crosstab

- 1 Open a form or report in the Design window, right-click a crosstab field and click Define Field.
- 2 In the Define Field Object dialog box, choose the field that you want to use in that field from the table list box.

To remove a field from a crosstab

- 1 Open a form or report in the Design window, right-click the upper-left corner of the crosstab object and click Define Crosstab.
- 2 Select a field in the Column, Categories, or Summaries panels.
- 3 Click the Remove Field button.

Specifying column headings and row headings (categories) for a crosstab

When Paradox generates a crosstab with multiple fields specified for categories, it sorts the information by the top category first, then by the next, and so on. For one-dimensional crosstabs you can choose only one field to supply column-heading values. For two-dimensional crosstabs, as long as you have at least one field specified for column headings, you can choose as

many fields as are available and that are valid in the tables of the data model for the row categories. Each field you add to the Categories list further refines the grouping of information.

To specify column headings for a crosstab

- 1 Open a form or report in the Design window, right-click a crosstab field and click Define Field.
- 2 In the Define Crosstab dialog box, enable the Column button and choose the field from the table list box that you want to use as column headings across the top of the crosstab.

To specify row headings (categories) for a crosstab

- 1 Open a form or report in the Design window, right-click a crosstab field and choose Define Field.
- 2 In the Define Crosstab dialog box, enable the Categories button and choose the field from a table list box that you want to use as row headings down the left column of the crosstab.



- You cannot use the same field for column headings and row categories. If you have already chosen a field from this table to supply the column heading values, that field will be dimmed.
- If you are creating a horizontal one-dimensional crosstab, do not choose a field for row categories.



- If you are creating a vertical one-dimensional crosstab, do not choose a field for column-heading values.

Specifying summary fields for a crosstab

Unlike fields you choose for column-heading values and row-category values, fields you summarize can be chosen more than once. The number of summary fields times the number of column values cannot exceed 254. After you specify the field(s) to summarize in a crosstab, you can specify which summary operation to perform (sum, count, min, max, or average). By default, Paradox performs the following operations:

- Sums number, money, short integer, long integer, autoincrement, and Binary Coded Decimal (BCD) field data
- Counts alpha, date, time, timestamp, or logical field data

To specify summary fields for a crosstab

- 1 Open a form or report in the Design window, right-click a crosstab field and click Define Field.
- 2 In the Define Crosstab dialog box, enable the Summaries button and choose the field from table list box on which you want to perform a summary operation. This provides the data for the crosstab.

To change a summary operation

- 1 Open a form or report in the Design window, right-click a crosstab field and click Define Field.
- 2 In the Define Crosstab dialog box, enable the Summaries button and choose a summary operation from the Summary list box.



- You cannot choose the same field to summarize as you have chosen for column headings or for row categories. If you have already chosen fields from the table to supply column heading and row category values, those fields will be dimmed.
- You can choose as many fields as are available and that are valid from the tables of the data model. The order in which you choose them determines the order in which the summarized data appears in the crosstab.

Modifying a crosstab

You can modify both the properties of each section of the crosstab, and the order in which the data appears within the crosstab. For more information on the properties available to crosstabs, see the Object property reference.

Changing the appearance of a crosstab

You can change the way each part of a crosstab looks; in other words, you can change the properties of the fields, columns, rows, and summary areas of the crosstab by using the Properties dialog box.

You can change the size of the entire crosstab, the column area, or the row area.

To change the appearance of a crosstab

- 1 Open a form or report in the Design window, select the crosstab. Selection handles appear around the crosstab.

- 2 Right-click the appropriate area of the crosstab and click Properties.
- 3 Select the properties you wish to be associated with the crosstab.

To change the size of the entire crosstab

- With the crosstab selected in the Design window, drag the crosstab's borders to the appropriate size.

To change the size of the column area

- Drag the grid lines surrounding the selected crosstab.

To change the size of the row area

- Drag the borders of the row area of the selected crosstab.

Rearranging category and summary fields on a crosstab

When you choose more than one field to define the row categories and more than one field to summarize, you can change the order in which the fields appear in the Categories and Summaries panels.

To rearrange category and summary fields in a crosstab

- 1 With the form or report open in the Design window, right-click the upper-left corner of the crosstab object and click Define Crosstab.
- 2 Use the Change Order arrows at the bottom of the Field Used In area.

These arrows become active when you select either Categories or Summaries and when you have more than one field in their panels.



- You can rearrange the categories or summaries in the Form Design and Report Design windows by dragging them to a different location.
-



QUERYING YOUR DATABASE

7

A query is a way to retrieve information from your database. Queries are usually in the form of a question. For example, you can find out which customers placed orders in a given month, the total amount billed for all orders, and which orders haven't been paid.

In a query, you can specify

- tables to ask questions about
- fields you want to see in the Answer table
- records you want to select
- calculations you want to perform
- new fields you want to create through calculations on table data.

You can query one table or several tables to get the information you need. Paradox finds the records that meet the conditions you specify and presents the results to you in an Answer table. If a query does not obtain the results you want, you can refine the query and run it again. You can also save a query definition to use it again.



- Many of the procedures and examples in this chapter use files from the Paradox Samples directory (default location is C:\Program Files\Corel\Shared\Samples). If you did not install the sample files, you can do so by performing a custom installation.

Uses of queries

By constructing queries that build on each other, you can ask “what if?” with your data. For example, you can find out:

- How much would total sales increase if sales to Oregon residents increased by 8%?
- How much would our travel costs increase if airline prices went up 10%?

You can also use a query to insert, delete, change, or perform calculations on your records.

Query properties and preferences

You can set properties for individual queries, such as the type and name of the results table, and whether the results are sorted. You can also set default preferences for all queries.

Live query views

Normally, when you perform a query, Paradox generates an Answer table that is read-only. In other words, you cannot change the information in the records. However, you can generate a live query instead of an Answer table by changing a query-property setting and then updating the information in the selected records.

Query building methods

Paradox provides four different methods to create queries for your database:

- Query By Example (QBE) is a popular query building method from earlier versions of Paradox. To perform a QBE query, you give Paradox an example of the result you want. You use selection conditions and example elements to define the query.
- The Visual Query Builder (VQB) provides a method to generate SQL queries quickly and easily without typing any SQL code. You create your query by choosing tables, fields, and other options through a graphical interface while the SQL code is generated in the background. You can see the SQL code being generated in the SQL editor as you choose options in the VQB window. For information about the VQB, see Using the Visual Query Builder to create SQL queries in the online Help.

- Direct coding in the SQL Editor is an advanced method for experienced database developers who have expertise in SQL. You can also use the SQL Editor to modify queries that were previously created through the Visual Query Builder or the Query Expert. For more information on SQL, see Using the SQL Editor and Using Local SQLLink the online Help.
- The Query Expert is the easiest method and will appeal to new database users. It takes you through a step-by-step process to create commonly-used query models. To launch the Query Expert, click Tools, Experts, and then double-click the Query icon.

Creating a QBE query

The types of queries you can create with Paradox and QBE are almost limitless. You can use query operators and calculation statements to extract just the information you need. No matter what kind of query you're creating, the technique you use to create the query has very little variation.

Creating a QBE query from a table

You can create a QBE query image directly from one or more existing tables.

To create a query based on a table

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Choose one or more tables from the list of tables, and click Open.
To choose more than one table, hold down CTRL and click each table you want to open.
- 4 Enable the check box beside each field you want to display in the Answer table.
- 5 Click Query, Run Query.



- If your query contains more than one table, you must link the tables with example elements before you run the query. See "Linking tables in a QBE query" on page 319.
-

Creating a QBE query based on a data model, form, or report

You can create a query based on an existing data model, form, or report. When you create a query based on a form or report, Paradox places in the

Query window an image of each table used in the data model of the chosen form or report. It also places example elements (and inclusion operators, if necessary) to join the tables according to the data model. Multiple tables in a query must be joined in this way.

To create a query based on a data model, form, or report

- 1 Click File, New, Query.
- 2 Choose Data Models, Forms, or Reports from the Files Of Type list box.
- 3 Choose the folder in which your data model, form, or report is located from the Look In list box.
- 4 Double-click a data model, form, or report from the list of files.
- 5 Enable the check box beside each field you want to display in the Answer table.
- 6 Click Query, Run Query.

Creating a QBE query based on another query

If you want to create similar queries, you can modify an existing query and save it under a new name. When you create a query based on another query, Paradox places a copy of the query in the Query window. Any existing selection conditions, example elements, (and inclusion operators, if necessary) are included in the query images.

To create a query based on another query

- 1 Click File, New, Query.
- 2 Choose the folder in which the existing query is located from the Look In list box.
- 3 Choose Queries in the Files Of Type list box.
- 4 Double-click a query in the list of files.
- 5 Make changes to the query image as appropriate.
- 6 Click File, Save, and type a name in the File Name box.

Opening and running a QBE query

As the information in your database increases or changes, you may have occasion to run the same query on it several times. After you have created and saved one or more queries, you can open and run them to obtain updated information. After Paradox runs a query, it either displays an Answer table or

changes data in a table, depending on the kind of query. See “Viewing query results” on page 324 for more information.

To open a query

- 1 Click File, Open, Query.
- 2 Choose the folder in which your query is stored from the Look In list box.
- 3 Click the query in the list of files.
- 4 Click the Open button.

To run a query

- Click Query, Run Query.

Example of creating a simple QBE query

To create a simple query that results in a list of customer names and phone numbers, follow these steps. This example uses the CUSTOMER.DB table located in your Samples directory.

- 1 Choose Sample from the list box in the Project Viewer.
- 2 Click File, New, Query.
- 3 Double-click the CUSTOMER.DB table.
- 4 Enable the check box beside the Name field.
- 5 Enable the check box beside the Phone field.
- 6 Click Query, Run Query.

Paradox displays the data in an Answer table.

QBE Query operators

There are eight types of Paradox query operators:

Reserved symbols

Operator	Meaning
Check	Display unique field values in an Answer table
CheckPlus	Display field values including duplicates in an Answer table
CheckDescending	Display field with values sorted in descending order
GroupBy check	Specify a group for set operators

Reserved words

Operator	Meaning
CALC	Calculate a new field
INSERT	Insert records with specified values
DELETE	Remove records with specified values
CHANGETO	Change specified values in fields
SET	Define specific records as a set for comparisons

Arithmetic operators

Operator	Meaning
+	Addition or alphanumeric string concatenation
-	Subtraction
*	Multiplication
/	Division
()	Group arithmetic operations

Comparison operators

Operator	Meaning
=	Equal to (optional)
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

Wildcard operators

Operator	Meaning
..	Any series of characters
@	Any single character

Special operators

Operator	Meaning
LIKE	Similar to
NOT	Does not match
BLANK	No value
TODAY	Today's date
OR	Specify OR conditions in a field
, (comma)	Specify AND conditions in a field
AS	Specify the name of a field in an Answer table
! (exclamation mark)	Display all values in a field, regardless of matches

Summary operators

Operator	Meaning
AVERAGE	Average the values in a group
COUNT	Count the number of values in a group
MAX	Find the maximum value of a group
MIN	Find the minimum value of a group
SUM	Total the values in a group
ALL	Calculate summary based on all values in a group, including duplicates
UNIQUE	Calculate summary based on unique values in a group

Set comparison operators

Operator	Meaning
ONLY	Display records that match only members of the defined set
NO	Display records that match no members of the defined set
EVERY	Display records that match every member of the defined set
EXACTLY	Display records that match all members of the defined set and no others

Operator precedence in QBE queries

Paradox evaluates operators in queries in a specific order.

In expressions that contain more than one operator, the operators are evaluated in the order of precedence shown in the following table:

Precedence	Operator
1	()
2	* /
3	+ -
4	= < > < <= > >=
5	NOT
6	OR
7	, (comma)

Any expression contained in parentheses is evaluated first, and inner levels of parentheses are evaluated before outer levels. When two or more operators of equal precedence are in a single expression, they are evaluated from left to right.

Rules for entering numbers in QBE queries

When you type a number into a number field (Paradox number, short integer, long integer, or money field and dBASE number or floating number fields) of a query image, do not type:

- dollar signs
- parentheses to signify a negative value
- thousand separators (neither a comma nor a period) when you specify a pattern match with the .. or @ wildcard operators. For more information see “Using wildcards to match a pattern” on page 338.

On the other hand, do type:

- decimal separators (a period in United States convention and a comma in international convention)
- the minus symbol to signify a negative value
- thousand separators when specifying an exact match numeric-selection condition

Paradox determines when a comma or a period is a whole-number or a decimal separator, first based on whether you have a United States or international number convention set, and second, based on the symbol’s position and context. Ambiguity arises when a comma could be Paradox’s AND operator, which is a comma, and when a period could be part of Paradox’s .. wildcard operator, which is two periods in a row.

If the meaning of a comma or period is not clear, you must help Paradox understand the symbol’s meaning by using double quotation marks or spaces.

The meaning of a comma or period meaning will not be recognized as a thousand separator if you are specifying a pattern match with the `..` or `@` wildcard operators; therefore, do not type thousand separators when you specify a numeric pattern with `..` or `@`.

If you are using the United States number format

Paradox interprets a single period in a number field as a decimal separator.

Paradox interprets the first two periods in a row as the `..` wildcard operator.

In a number field, if Paradox encounters three periods in a row, it interprets them as the `..` wildcard operator followed by the decimal separator. To make Paradox interpret the first period as the decimal separator, enclose it in double quotation marks.

Paradox interprets a comma in a number field as a thousand separator if you are specifying an exact match and if the comma is in the proper position to be a thousand separator. To make Paradox interpret a comma as the AND operator where this meaning might not be clear, type a space or any other non-numeric character (except `@` or a period) after the AND comma. For example, you could type a comparison operator.

If you are using the international number format

Paradox interprets the first comma in a number field within a number as the decimal separator.

Paradox interprets a comma followed by a space or any other non-numeric character (except `@` or a period) as the AND operator in a number field.

Paradox interprets a single period in a number field as a thousand separator if you are specifying an exact match and if the period is in the proper position within a numeric selection condition.

Using reserved words or symbols in selection conditions

In a QBE query image, to specify an alphanumeric value that contains a period or comma or a Paradox reserved word, the value must be enclosed in double quotation marks. Paradox then recognizes the quoted characters as a value and does not act on their special meaning.

If the value itself contains a double quotation mark, precede the quotation mark with a backslash (`\`):

- Thomas E. \"Ned\" Lawrence

If the value contains a backslash, precede that backslash with another backslash (`\\`).

You do not need quotation marks to enclose blank spaces in a value. You do need them, however, for all other symbols and operators that have special meanings in Paradox, such as commas, periods, and asterisks.

Choosing tables for a QBE query

You can create a simple query based on only one table, or a complex query based on up to 24 tables. If you are querying more than one table, you must link the tables under common fields.

Multi-table queries

Two or more tables usually contain different information about the same person, place, or thing. To combine this information, you can query more than one table at the same time.

Multi-table queries are similar to single-table queries, except that

- you must fill out a separate query image for each table
- you must use example elements to identify common fields among the tables. In other words, you must link the tables based on their common fields for the query to work.

Linking tables in a multi-table query

Sometimes, three or more tables you are querying have the same field in common. In that case, you use the same example element to link all the tables.

The more usual case occurs when three or more tables have different fields in common. For example, Table 1 and Table 2 have one field in common, Table 2 and Table 3 have a different field in common, and Table 1 and Table 3 have no fields in common. You must use a unique example element for each link. In this case, you could use the example element abc to link Tables 1 and 2 and use xyz to link Tables 2 and 3.

Using a multi-table design to link tables

Paradox lets you automatically link tables in a query by using a linked multi-table design document you have already created. If you have already set up table relationships for the purpose of a multi-table design document, you can use that object as the basis of your query. Paradox adds the tables used in the document to the Query window and places example elements to join the tables according to the document's data model. For more information, see "Creating a QBE query based on a data model form or report" on page 311.

Adding query tables

You can open a query with one or more tables and add tables to the query.

To add tables to a query

- 1 Open the query to which you want to add tables.
- 2 Click Edit, Insert Table.
- 3 Select the table(s) you want to add to the query.

To select multiple tables, hold down CTRL and click the name of each table.

- 4 Click Open.



- Whenever you create a query using more than one table, you must link them. For more information, see “Linking tables in a QBE query” on page 319.
-

Removing query tables

You can open a query with one or more tables and remove tables from the query.

To remove tables from a query

- 1 Open the query from which you want to remove tables.
- 2 Click Edit, Remove Table.
- 3 Select the table(s) you want to remove in the Table To Remove list.

To select multiple tables, hold down CTRL and click the name of each table.

Linking tables in a QBE query

When you query more than one table, you must use example elements to link the tables under a common field. These linking fields are fields in each table that contain the same kind of information. For example, Customer and Orders both have a field that contains customer identification numbers called Customer No. Because the information in both fields is compatible, you can link these two tables on that field.

Linking fields do not need to have the same field name, but they must meet the following requirements:

- They must be of compatible types. You cannot, for example, link a number field in one table to an alpha field in another.
- They cannot be memo, formatted memo, graphic, OLE, or binary fields.

The example elements you use to join your tables can be any unique combination of letters and numbers. If you use the Join command to link your tables, Paradox assigns an example element automatically, in the form of “join1”, “join2”, etc. When you use an example element to link tables, you must enable the check box beside one of the fields in one of the tables to display that field in the Answer table.

To link tables using example elements

- 1 Click the first field you want to link.
- 2 Press F5, and type your example characters in the field.
The example characters should appear in red.
- 3 Click the next field you want to link.
- 4 Press F5, and type the same example element as you typed in step 2.
- 5 If you need to link additional fields, repeat steps 3 and 4 using the same example element, as necessary.

To link tables using the Join command



- 1 Click the *Join Tables* button.
- 2 Click the appropriate field of each query image.



- You can only link two tables at a time using the Join command.

Examples of a multi-table QBE query

Example 1

Suppose you want to use the sample tables to see which dive shops have placed orders. The sample Orders table, however, only shows the Customer ID number and not the dive shop names. The sample Customer table contains the dive shop names. Therefore, you want to use example elements to link Customer and Orders on their common Customer No fields to retrieve

- orders information from Orders
- the names of the dive shops that have placed orders from Customer

The following figure shows the use of an example element to link two tables:

Query: BLINKSCUBIE

Customer.db	Customer N	Name	Street	City

Orders.db

Order No	Customer N	Sale Date	Ship Date

Table: PROVANSWER.DB

	Customer No	Name	Order No
1	1,221.00	Kauai Dive Shoppe	1,001.00
2	1,221.00	Kauai Dive Shoppe	1,023.00
3	1,221.00	Kauai Dive Shoppe	1,059.00
4	1,221.00	Kauai Dive Shoppe	1,076.00

Example 2

Suppose you want to know which dive shops outside of California have placed orders for items from \$500 to \$1,500 in selling price and have had these items shipped via Federal Express or Emery.

The following figure shows the use of two example elements to link three tables:

Query: DASHROTT.DB

Customer.db	Customer N	Name	Street	State/Prov

LineItem.db

Order No	Stock No	Selling Price

Orders.db





Order No	Customer N	Ship VIA

Table: PROVANSWER.DB

	State/Prov	Selling Price	Order No	Ship VIA
6	AL	599.00	1,061.00	FedEx
7	FL	599.00	1,071.00	FedEx
8	FL	599.00	1,171.00	FedEx
9	Grand Cayman	599.00	1,004.00	FedEx
10	Grand Cayman	650.00	1,392.00	FedEx
11	Grand Cayman	735.00	1,292.00	FedEx
12	HI	599.00	1,006.00	Emery
13	Jamaica	735.00	1,145.00	FedEx

Selecting fields to display in a QBE query

After you select the tables you want to query, you need to specify what fields you want to see in the Answer table. Each field of a query image has a check box. The column on the far left under the table name also has a check box. Enable a field's check box to include that field in the Answer table for the query. When you right-click a field's check box, you see the different types of checks you can use.

Check type	Properties
 Check	Displays all unique values for the selected field in ascending order (A to Z or 0 to 9). When used with a summary operator, a check mark specifies that the records should be divided into groups based on the values in the checked field.
 CheckPlus	Displays all values in a field, including duplicates, without sorting. The values sort in the Answer table in the same order they appear in the queried table.
 CheckDescending	Displays unique values sorted in descending order (Z to A or 9 to 0).
 GroupBy	Specifies a group of records to use in a set query. A field with the GroupBy checkmark does not appear in the Answer table.

Selecting fields using the Check symbol.



Customer No.	Name	Street	City	State/Prov	Zip/Post
1,221,000	Wine Dark Shoppe	4-BN Eagle Road Hwy	Papua New		
1,231,000	Wine	PO Box 2,547	Portmout		
1,261,000	Sight Dore	1 Reg Lane East	Palo Papias		
1,264,000	Cayman Dore World Unlimited	PO Box 541			
1,268,000	Tom Sawyer Shog Centre	8032 1 Ward Pyndens	Cromland		
1,268,000	Blue Jack Aqua Center	29-730 Paddington Lane	Wagafu		
1,264,000	WPF Quary Club	30 Main St	Cromland		



- When you use CheckPlus in any field of the query image, it overrides any Checks or CheckDescendings you have placed in any other field. This is because Paradox cannot both sort and exclude duplicates — which is what the Check and CheckDescending tell it to do — and not sort and include duplicates — which the CheckPlus tells it to do.
- Although you can place Checks and CheckDescendings in BLOB fields, Paradox treats them as CheckPluses in these fields. Paradox cannot sort or distinguish unique from duplicate values in these field types.

Selecting QBE query fields

To display a field in the Answer table, you must place a check mark of one type or another in the check box next to that field.

To place the default check mark

- Enable the field's check box.

To place a CheckPlus, CheckDescending, or GroupBy check mark

- Right-click the field's check box, and choose the type of check mark you want from the menu.

To select all fields in a table

- Enable the check box in the left-most column of the query image (under the table name).

Working with QBE query images

After you select the table(s) you want to query, Paradox opens the query window that contains query images of each table you have selected to query. The query image has the same fields, in the same order, as the table it represents, but no data. If you have changed the table's properties (for example, changed the field order or the way heading text is displayed), the query image does not reflect them.

You type data into and navigate through the fields of a query image the same way you would in a table in Edit mode. For example:

To...	Do this...
Add a row	Press the INSERT key (works only if you have changed the current row).
Delete a row	Press CTRL + DELETE.
Enter Field View	Press F2.

To cascade or tile query images

Paradox provides two ways for you to display multiple query images in a Query window:

- Click View, Cascade Tables to view multiple query images cascaded in the Query window.
- Click View, Tile Tables to view multiple query images tiled vertically in the Query window.

Moving fields in a QBE query image

You can move a field to a new position in the query image, or to the end of the query image. The position of the fields in the query image does not affect the sort order of the Answer table.

To move a field in a query image

- Drag a column heading to a new location in the query image.

To move a field to the end

- Select the column you want to move and press CTRL + R.

Viewing query results

When run, most queries display an Answer table, which is placed in your private directory. However, if your query uses the INSERT, DELETE, or CHANGETO reserved words, Paradox does not display an Answer table. Instead, it changes the data in one of the tables represented in the query and creates an Inserted, Deleted, or Changed table. If you have enabled the Fast Queries option on the QBE page of the Preferences dialog box, Paradox will not create INSERTED, DELETED, and CHANGED tables.

Live query views

You can edit the Answer table, but any changes you make are not reflected in the original table or tables that you queried. If you want to create an Answer table that does update the original table when you change it, you must create a live-query view instead of an Answer table. For more information, see “Live query views” on page 328.

The Answer table

A Paradox query that retrieves data or performs calculations gives you an Answer table. The Answer table is a temporary table that Paradox stores in your private directory and replaces each time you perform a query. Paradox deletes the Answer table when you exit Paradox. If you want to save the Answer table, you must rename it, or save it to a different directory.

Modifying and renaming the Answer table

You can change the properties of the Answer table before you run the query, and you can rename an Answer table after you run a query. By default, Paradox names the result of a query ANSWER.DB and places it in your private directory. If you rename this table, Paradox does not treat it as a

temporary table, and does not delete it when you change working directories or exit the program.

The structure of the Answer table closely reflects the structure of the query example: the left-most field checked in the first image becomes the left-most field of the Answer table, and so on. You can change the field order to better suit your needs.

To change Answer table properties

- 1 Click Query, Properties.
- 2 Click the Answer tab.
- 3 Choose any of the following options:
 - Enable the Live Query view button to create a Live Query View instead of an Answer table.
 - Enable the dBASE button to generate an Answer table as a dBASE table.
 - Type a new name and location for your Answer table in the Table Name box.

For a complete description of available query properties, see “Setting QBE query properties” on page 352.

To rename the Answer table

- 1 Run your query.
- 2 Click Format, Rename Table.
- 3 Type a new name for the table.

You can type the full path if you want to save the table to a different folder (other than your private folder).

To change the Answer table field order

- 1 Click Query, Properties.
- 2 Click the Structure tab.
- 3 Click the name of a field you want to move in the Answer Fields list.
- 4 Click the UP ARROW or DOWN ARROW buttons to move the field.



- Settings made with the Query Properties command are saved with the query.

Renaming Answer table fields

When you enable the check box beside a field in a query image, Paradox displays that field in the Answer table with the same name it had in the original table. If the Answer table contains fields with duplicate field names from two or more tables, Paradox names the first field by its exact field name and numbers the duplicates, calling them Name_1, Name_2, etc. You can use the AS operator to change the field name in the Answer table. The AS operator changes field names only in the Answer table. It doesn't change field names in the table(s) you query.

When you use the CALC operator, Paradox creates a new field in the Answer table that contains the results of a calculation. Paradox automatically places the new calculated field at the end of the Answer table and gives it the name of the calculation. You can specify a new name using the AS operator.

To specify a different name

- 1 Click the field in the query image to which you want to assign a different name.
- 2 Type "AS", followed by a space.
- 3 Type the name you want the field to be called in the Answer table.

To specify a different name when using a selection condition

- Type the selection condition followed by a comma (,), and then type "AS", followed by a space, followed by the new field name.

Sorting the Answer table

You can change the sort order of the Answer table before you run your query. By default, Paradox sorts first under the left-most field in the Answer table, followed by the next-to-left-most field, and so on. You can set your Answer table to sort first under any of the fields, without changing the order in which they appear.

To sort the Answer table

- 1 With the query open, click Query, Properties.
- 2 Click the Sort tab.

- 3 Use the RIGHT ARROW button to move the fields from the Answer Fields list to the Sort Order list. Add the fields in the order you want the Answer table sorted.
- 4 To remove a field from the Sort Order list, click its name, and click the LEFT ARROW button.
- 5 To change the order of the fields in the Sort Order list, select a field and use the UP ARROW and DOWN ARROW buttons to move the field up or down in the list.



- Because Sort is a query property, sort information is saved with the query and applies only to that query.

Sorting Answer-table values in descending order

By default, Paradox sorts records in the Answer table in ascending order based on the values in the fields you enable, from left to right. That is, it sorts on the left-most field, then the next field, and so on.

Here is how sort order applies to the different Paradox field types:

Field type	Examples of sorted values (low to high)
Number	0 to 10
Alpha	A, a to Z, z
Date	1/1/97 to 12/31/97
Money	\$1.99 to \$99.99
Memo	(not sorted)
Graphic	(not applicable)
Time	00:00:01 to 23:59:59
Logical	False to True F to T No to Yes 0 to 1

Paradox sorts numbers and other nonalphabetic characters according to the sort order you installed. Alphanumeric "10" sorts before "2" although it is numerically larger.

To specify that values be sorted in descending order

- Right-click the check box beside the appropriate field, and choose CheckDescending.



- In BLOB fields and in dBASE memo fields, Paradox treats Check and CheckDescending as if they were CheckPlus. You cannot use GroupBy in BLOB fields or dBASE memo fields.

Live query views

When you create a Paradox query that generates an Answer, the Answer table generated by the query does not maintain a relationship with the original table you queried. Edits you make to ANSWER.DB are not reflected in the original table. If you want changes you make to be reflected in the original table, you can create a live query view.

When you create a live query view, Paradox generates an answer set that is a limited, direct view into the table you queried. The view is limited by the selection conditions you specify in the query. When you edit the live-query view, you are really editing the table you queried and using this limited direct view to see only the data you want from that table.

Multi-table QBE queries can't return live-query views. Structured Query Language (SQL) queries on up to three tables can return live-query views.



- Although you request a live-query view on the Answer page of the Query Properties dialog box, Paradox might not actually produce a live-query view. Paradox will not produce a live-query view if you did not use CheckPlus; Check and CheckDescending caused sorting instead. Paradox will also not produce a live-query view if you performed an INSERT, DELETE, CHANGETO, or CALC query.
- If a query view can't be live, Paradox still generates a query view, not an Answer table; however, all the fields are read-only. You'll still see updates other users make to the table, provided it is a Paradox table and the Refresh Rate is not 0.



- You will get better performance on single-table queries if you use a live-query view. You can set your query options to default to create live-query views. See "Modifying and renaming the Answer table" on page 324.

Rules for live-query views

Not all queries can return live-query views. A live-query view must meet the following conditions.

- You can create a live-query view only on single-table queries.
- You must use the CheckPlus operator. The live-query view cannot be sorted; therefore, Check, CheckDescending, and GroupBy checks are not allowed.
- You cannot use the Sort Answer Table button or the Sort settings on a live-query view.
- You cannot use calculated fields in a live-query view.
- Multiline OR queries are not allowed.
- The selection conditions you specify in the query must be capable of being expressed as a filter. This means the following query structures are not allowed:
 - References to one field in the selection condition of another field.
 - References to aggregates in the selection condition.
 - Use of the @ wildcard operator.
 - Use of the “..” wildcard operator before selection conditions.
 - Use of the .. wildcard operator after a selection condition is allowed, as in the example Canada.., and produces a case-insensitive answer set.

Creating a live-query view

You can create a live-query view on any single-table QBE query that meets the requirements outlined in “Rules for live-query views” on page 329.

To create a live-query view

- 1 Open the query for which you want to generate a live view.
- 2 Click Query, Properties.
- 3 Click the Answer tab.
- 4 Enable the Live Query View button, and click OK.



- Remember that all selected fields in the query image must be selected using the CheckPlus option. To change to CheckPlus, right-click the check box, and choose CheckPlus from the list.
-

Editing a live-query view

You can edit the data in a live-query view in the same manner as you would edit any other table in Paradox. When Paradox creates a live-query view, you'll see the words Query View and the name of the .QBE file that generated the live-query view (if the .QBE file has been saved) in the Title Bar of the live-query view. All changes to data in the live view immediately appear in the original table.

To edit the live-query view

- 1 Click View, Edit Data.
- 2 Edit the data in the live view as needed.



- You can use CTRL + DELETE to delete a record from the live-query view; this command also deletes the record from the table you queried. Deletions from Paradox tables cannot be undone.



- For more information on editing table data, see “Editing data” on page 144.
-

Saving a live-query

You can save a live query view in the same manner as you would save a query that generates an Answer table. Each time you open and run the query, Paradox generates a new live-query view of the table's data.

The live-query view is a temporary view of the table you queried. You can save this query view as a new table. Edits you make after saving a live-query view are no longer reflected in the table you queried.

To save a live query

- 1 Click File, Save As.
- 2 Choose the folder in which you want to save the live-query from the Save In list box.
- 3 Type a name for the live-query in the File Name box.

To save a live-query view as an Answer table

1 Run the live-query.

2 Click File, Save.

The live-query view is converted to a standard Answer table and placed in your private directory.

To save a live-query view as a Paradox table

1 Run the live-query.

2 Click File, Save As.

3 Choose the folder in which you want to save the live-query view from the Save In list box.

4 Type a name for the live-query view in the File Name box.

Specifying query selection conditions

In most queries, you want to see only records that meet certain conditions. You use the query operators to define selection conditions.

You can define selection conditions that test for the following types of matches:

- exact matches
- matching a range of values: comparison operators
- inexact matches: the LIKE operator
- non-matches: the NOT operator
- blank values: the BLANK operator
- today's date: the TODAY operator
- character patterns: wildcard operators

You can also use AND and OR to indicate whether a record must match all the defined selection conditions or just one of them.

Understanding selection conditions

Selection conditions are used to narrow the scope of the information you retrieve with a query. You use combinations of operators, reserved words, and symbols to define the type of information you are looking for. You must follow certain rules when you enter selection conditions and calculation statements in query images.

You can type a selection condition in a field without enabling the check box for that field. Enabling the check box tells Paradox to display that field in the Answer table. You do not have to include a field in the Answer table to use its values to select records.

Specifying two selection conditions for a field

You can enter two or more selection conditions in the same field of a QBE query image by separating the conditions with commas. The comma acts as an AND operator and tells Paradox that both (or all) of the selection conditions must be met for a match to occur. You can also combine AND and OR conditions in a single query.

To match a value that includes a comma (like Acme, Inc.) you must enclose the value in quotation marks or Paradox will interpret the comma as an AND operator. For example, you would type "Acme, Inc".

Sometimes you use the OR query when you are asking an "and" question. For example, if you want all records in CA and HI, you must query for CA OR HI because no single record has both values.

Using Arithmetic operators in QBE queries

You can use arithmetic expressions in number, date, time, and money fields of a query image.

Operator	Meaning
+	Addition or string concatenation
-	Subtraction
*	Multiplication
/	Division
()	Used to group expressions

Use parentheses () to combine and group operations and to indicate which calculations should be performed first. In expressions without parentheses, multiplication and division are performed before addition and subtraction. Operations with equal precedence are calculated from left to right. For more information on operator precedence, see "Operator precedence in QBE queries" on page 315.

Arithmetic operators are especially useful with the TODAY operator, the CALC operator, and with example elements.

You can use arithmetic expressions with date values and the TODAY operator to

- add a number of days to a date
- subtract a number of days from a date
- subtract one date from another date to produce a range of days

Use arithmetic operators to create arithmetic expressions with field values. You can use any of the arithmetic operators in the number fields — Paradox number, short integer, long integer, BCD, money, dBASE number, and dBASE floating number fields.



- Not all Paradox field types will support arithmetic operators. For a list of compatible field types, see Paradox field types allowing arithmetic operators in the Reference section of the online Help.
-

Specifying matches in selection conditions

Paradox allows you to create selection conditions that match one or more specific values in the queried table(s). You can also match types of values, or character patterns.

You can specify the following types of matches:

- exact matches
- inexact matches (the LIKE operator)
- ranges of values (comparison operators)
- non-matches (the NOT operator)
- blank values (the BLANK operator)
- today's date (the TODAY operator)
- patterns of non-specific characters (wildcard operators)

Specifying exact matches

You can define a selection condition that retrieves only records that have a specific value in a field. Paradox includes in the Answer table only records with that value in that field. Exact matches are case-sensitive. You can specify exact matches for as many different fields as you want. Type all of the values you want to see — exactly as they appear in the table — in the appropriate fields of the query image.

To create an exact match selection condition

- Type the value you are looking for in the appropriate field of the query image.

Field type restrictions

You cannot specify exact matches for BLOB fields. You must use the .. wildcard operator to specify selection conditions in memo and formatted memo fields. See “Using wildcards to match a pattern” on page 338.

Exact matches of logical fields include uppercase or lowercase T and F and any combination of uppercase and lowercase letters of the entire words True and False.

Specifying inexact matches: the LIKE operator

You can use the LIKE operator in a QBE query image to match inexact alphanumeric values. This is particularly useful for finding values that contain typographical errors or alternate spellings.

If the Answer table to a query does not include some records you expected to see, try using LIKE with one or more alpha fields; the records you are looking for might contain typographical errors, misspellings, or alternate spellings.

There are two general rules for obtaining a match with the LIKE operator:

- The first character of the pattern you specify with the LIKE operator must match exactly (though case does not matter). “LIKE California” does not match Kalifornia.
- A pattern matches if at least one-half to two-thirds of the characters match.

To use the LIKE operator

- Type “LIKE” in front of the value you think will match the records you want.

Field type restrictions

You cannot use LIKE on BLOB fields or dBASE memo fields.

Although you can use LIKE in number and date fields, you will get better results by using the wildcard operators .. and @ to specify a number or date pattern.

Matching a range of values: comparison operators

If you want a QBE query to retrieve records that match a range of values, use comparison operators, also known as range operators. Comparison operators let you specify a range of values in a single field. You can combine comparison operators to construct a limited range of values.

To use a comparison operator

- Type it in front of the value you are using to define the range.

To combine comparison operators

- Separate all the comparison conditions with a comma.

Equal to* (=)

Examples	Match
= 3/17/97	Only March 17, 1997
= Ralph	Only Ralph
= False	Only False

Greater than (>)

Examples	Match
> 3/17/97	Dates later than March 17, 1997
> "Ralph"	"Rat", "Rudolph", etc.
> "False"	True, T, Yes, I

Less than (<)

Examples	Match
< 3/17/97	Dates before March 17, 1997
< "Ralph"	"Charles", etc.
< "True"	False (by convention, False < True)

Greater than or equal to (>=)

Examples	Match
>= 3/17/97	March 17, 1997 and later dates
>= "Ralph"	"Ralph", "Raphael", "Randolph", etc.

Less than or equal to (<=)

Examples

Match

<= 3/17/97

March 17, 1997 and earlier dates

<= "Ralph"

"Ralph", "Manny", "Charles", etc.

*The = operator is optional in these cases because it is assumed when no other comparison operator is used.

Example

The following query retrieves all stock that costs more than \$1000:



The screenshot shows a Paradox database window titled "Query : QGREATER.QBE". It displays a table with columns "Stock No" and "List Price". The table contains four rows of data. The window also shows a filter condition ">1000" for the "List Price" field.

	Stock No	List Price
1	900.00	\$2,524.25
2	912.00	\$1,932.00
3	11,221.00	\$2,724.35
4	11,238.00	\$2,872.70

Field type restrictions

You can use comparison operators with alphanumeric values and all number, date, and logical values. You cannot use them with BLOB or dBASE memo values; you can only use the equal to (=) operator with these types.

Specifying non-matches: the NOT operator

The NOT operator finds records that do not have a specified value in a particular field. NOT can precede exact values, ranges, wildcard patterns, or other selection conditions. In fact, you can precede any valid Paradox selection condition with NOT.

If the selection condition you specify after NOT is an exact match condition, you must type the condition with exactly the same capitalization and spelling as the matching value appears in the table. Values in logical fields are an exception to this rule. The case of the NOT operator does not matter.

To use the NOT operator

- Type “NOT” before the example of the value you do not want to see.

Finding blank values

The BLANK operator finds records with no value in a specified field. In some cases, the absence of a value is in itself a useful piece of information. You might also want to find records with a blank field so you can fill in information that was unavailable when the record was entered. You can combine NOT with BLANK to find all records that have any value in the specified field.

Searching for blank field values is entirely different from leaving a field blank in a query image. Using the BLANK operator tells Paradox you want to see only those records that have no value in the specified field. However, when you leave the field of a query image blank, Paradox does not consider the field at all when selecting records.

To use the BLANK operator

- Type “BLANK” in the appropriate field of the query image.



- When you use comparison operators or sort by a field that has blank values, blank fields are considered to have a lower value than any nonblank value.

Finding the current date

In date fields of a QBE query image, the TODAY operator always stands for today’s date. Make sure your computer’s calendar is set properly. TODAY is especially useful for aging payables and receivables when you use Paradox’s arithmetic operators.

To use the TODAY operator

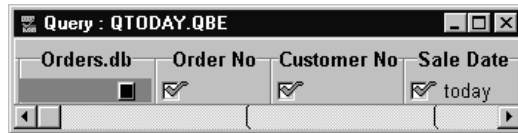
- Type “TODAY” in the appropriate field of the query image, in combination with the appropriate operators or values.

For example:

Expression	Meaning
< TODAY	Finds dates earlier than today’s date
< TODAY - 90	Finds dates earlier than 90 days ago
TODAY + 30	Finds dates 30 days ahead of today’s date

Example

The following query retrieves orders that were placed on the day that the query is run:



Using wildcards to match a pattern

Paradox provides two wildcard operators to match patterns of characters in QBE queries. Although the LIKE operator is useful for finding inexact matches in alpha fields, wildcard operators give you more flexibility.

You can type any combination of uppercase and lowercase letters and your query will produce the same results.

The .. wildcard operator

The .. wildcard operator matches any series of any number of characters, including blank spaces. The .. wildcard operator is case-insensitive.

Pattern	Matches
G..	Giant, gigantic, Georgia
g..t	Giant, gross weight
..D	Grand, Elm Road
..e..s	Phillip Edward Wilson, roses
7..5	7485, 70,005
6/../%	6/01/96, 6/25/96

The @ wildcard operator

The @ wildcard operator matches any single character (letter or number). You can use any number of @ characters to specify a pattern. The @ wildcard operator is case-insensitive.

When you know how many characters are in the pattern you're looking for, you can use that number of @ wildcard operators instead of using the .. wildcard operator.

Pattern	Matches
m@@e	Mike, more, made
wom@n	Woman, women
s@@@@	Smith, Smyth, scent
19@2	1922, 1972, 1992

Field type restrictions

You can use these operators in any field except in binary, graphic, OLE, or logical fields.

To retrieve values from a memo or formatted memo field, you must use the `..` wildcard operator to specify a pattern-selection condition. Typing an exact match in these field types means typing the entire memo value; to prevent this unnecessary effort, Paradox does not allow it. You can also use the `@` wildcard operator to specify a pattern match in these field types, but you must use it in combination with the `..` wildcard operator.

Using wildcards with numbers

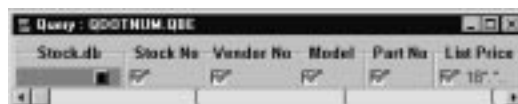
If the meaning of a comma or period is not clear, you must help Paradox understand the symbol's meaning with double quotation marks or spaces. The meaning of a comma or period will not be clear as a thousand separator if you are specifying a pattern match with the `..` or `@` wildcard operators; therefore, do not type thousand separators when you specify a numeric pattern with `..` or `@`.

If there is a chance that a decimal or thousand separator will be confused with the `..` or `@` wildcard operator, use quotation marks. For details, see "Rules for entering numbers in QBE queries" on page 316.

Paradox considers only significant digits in Paradox number fields when you use wildcard operators. For example, `@@@@.@` matches 400.70, because the last 0 isn't significant. By contrast, `@@@@.@@` doesn't match 400.70 for the same reason.

Example

The following query finds all stock having a list price of \$18 and any number of cents.



dBASE numbers

A dBASE number field has trailing zeros to the right of the decimal place. Therefore, you must add the `..` operator to the end of a numeric pattern, even if you are trying to match the last digits. For example, `...95..` will match all numeric values ending in `.95`, but `...95` will not match.

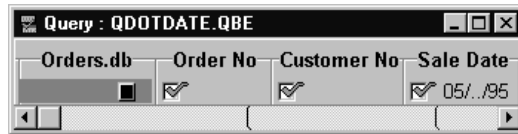
Using wildcards with dates

When you enter date values for exact matches in a query image, you can use any date format that Paradox supports, including custom formats.

However, when you use a wildcard to find a date, the pattern you define with the wildcard operator must reflect the date format you have set in both the Borland Database Engine (BDE) Configuration Utility and the Regional Settings in the Windows Control Panel. The BDE and Control Panel date settings must match.

Example

If the date format set in both BDE and Control Panel is `mm/dd/yy`, you can find orders placed in May of 1995 like this:



If you have another date format set, use that format in the wildcard query.

Using AND in selection conditions

When you enter selection conditions in separate fields on the same line of a QBE query image, all conditions on that line must be met by a record in the table for the query to retrieve that record. This type of operation is called a logical AND, and means that all conditions must be met.

You can also express a logical AND in a single field — that is, enter more than one condition in a field and require that they all be met — by separating the conditions with commas.

The comma acts as an AND operator and tells Paradox that both (or all) conditions must be met for a match to occur.



- If you want to enter a comma in a query without Paradox interpreting it as the AND operator, enclose the comma in quotation marks.
- You can use the AND operator in all field types including BLOBs. Whenever you query a memo or formatted memo field, you must use the .. wildcard operator in addition to any other selection conditions or operators you use.

Specifying AND conditions in the same field

The comma (,) acts as an AND operator, and tells Paradox that both (or all) conditions must be met for a match to occur. Because a value in a single field cannot be two or more values at the same time, the AND conditions you specify in a single field can be any kind except exact match conditions — for example, two or more types of patterns, or two range conditions.

You can specify AND selection conditions across linked tables in the same way as you would specify AND conditions for a single table.

To specify an AND selection condition in a single field

- Use a comma (,) to separate AND conditions in a single field of a QBE query image. Type the entire AND expression on the same line of the field.

Example

The following query asks to see list prices in the Stock table that are less than or equal to \$50.00 and that end with the number 5.

	Stock No	Model	Part No	List Price
1	2,350.00	89T pp1	28-033-008	\$33.35
2	5,313.00	X-Suf	32-401-000	\$47.15
3	5,324.00	X-Chi	32-402-000	\$47.15



- If you have the United States number format set, spaces are not necessary between the conditions and the AND (,) operator. If you have the international number format set, a space is necessary on one side of the comma.

Specifying AND conditions in different fields

You can specify exact matches on more than one field in a single query — that is, all conditions must be met for a match to occur. You can specify AND selection conditions across linked tables in the same way as you would specify AND conditions for a single table.

To specify AND conditions in different fields

- Type the conditions on the same line of the QBE query image, and place each condition in its respective field.

You must type all of the values you want to see — exactly as they appear in the table — in the appropriate fields of the query image.

Example

The following query specifies AND conditions on more than one field:

Query: GANDHII DEC

	Stock No	Vendor No	Equipment Class
	5,313.00	3,511.00	Tools

Table: PRIVANSWER.DB

	Stock No	Vendor No	Equipment Class
1	5,313.00	3,511.00	Tools
2	5,324.00	3,511.00	Tools
3	5,349.00	3,511.00	Tools
4	5,366.00	3,511.00	Tools
5	5,378.00	3,511.00	Tools

Using OR in selection conditions

You can set logical OR operations in a QBE query. That is, you can retrieve records that meet either of two (or any of several) conditions. You can create a query that specifies OR conditions in two or more tables. You can also combine AND and OR conditions in a single QBE query.

Field type limitations

You can use the OR operator in all field types, including BLOBs. Whenever you query a memo or formatted memo field, you must use the .. wildcard operator in addition to any other selection conditions or operators you use.

Specifying OR conditions in the same field

Specify conditions in a single field on the same line of a QBE query image to tell Paradox you want records that meet any of two or more conditions in that field.

To specify an OR selection condition in a single field

- Type the conditions in the field, separated by the OR operator.

Example

The following query retrieves a list of all dive shops from the sample Customer table that are in either California or Hawaii.



The screenshot shows a Paradox database window titled 'Query: Q001.qbe'. Below the query image, a table titled 'Table: :PRIVANSWER.DB' displays the results of the query. The table has four columns: 'Name', 'City', and 'State/Prov'. There are four rows of data, each with a row number in the first column.

	Name	City	State/Prov
1	American SCUBA Supply	Longs	CA
2	Blue Glass Happiness	Santa Monica	CA
3	Blue Jack Aqua Center	Waipahu	HI
4	Catalina Dive Club	Catalina Island	CA

Specifying OR conditions in different fields

You can specify OR conditions for different fields of the table you are querying. You perform this kind of OR operation by typing selection conditions on different rows of the QBE query image.

To display fields in the Answer table with this kind of query, you must check the check boxes in the same field in each row. For example, if you check the Name field in the first row, you must also check the Name field in all other rows of the query. Otherwise, Paradox displays error messages that state that the query appears to ask two unrelated questions or that one or more query rows do not contribute to the Answer.

If you are working with multiple tables, all query images of linked tables must have the same number of rows and be linked with different example elements for each line of the common field.

To specify an OR selection condition between different fields

- Type the conditions on separate rows of the query image.

To add additional rows to the query, follow the editing instructions in “Working with QBE query images” on page 323.

Example

The following query finds the names of the contacts for customers located either in the city of Nassau or in the country of Jamaica. The same example elements are used on corresponding rows of the query images (join1 on the top rows and join2 on the bottom rows).



- You can't use the OR operator on example elements. The condition Qty or Price, where Qty and Price are example elements, returns an error message. This is because an example element stands for all the values in the field. You can't tell Paradox that either Qty or Price can represent all the values in the field.

Using example elements in QBE queries

An example element represents values in the field in which it is placed. Example elements are used in two ways in Paradox:

- In single-table queries, you can use example elements with query operators to perform calculations with the values in a particular field. An example element represents each value in turn from that field in the selection condition.
- In multi-table queries, you can use example elements to link tables by common fields. The example elements tell Paradox that two fields contain common data although their field names differ. Each example element acts as a place marker and means “If a record selected from Table A has a value in this field, link it with all the records from Table B that have the same value in the corresponding field.”

You can use example elements in all fields except BLOB fields.

Creating example elements

You can type your own example elements directly in the query image, or you can let Paradox do it for you by clicking the Join Tables button. When you create your own example elements, you make up names that are meaningful to you. The Join command creates a special example element, specifically designed for the purpose of linking tables in a multi-table query. For more information on linking tables, see “Linking tables in a QBE query” on page 319.

When you use example elements to link tables, you can add as many selection conditions as you want. You can place conditions in any QBE query image. The only requirement of a multi-table query is that all tables in the Query window be linked to each other.

Example elements can contain any alphabetic characters (A-Z, a-z), digits (0-9), or both. They must not contain spaces, or any of the following characters:

* () - + / .

Paradox assumes you have completed the example element when you do any of the following:

- Move to another field, line, or query image.
- Press SPACEBAR.
- Type one of the characters that can’t be part of an example element.

Subsequent characters you type appear in normal text.

To create an example element

- 1 Click the field in the query image for which you want to create an example element.

- 2 Press F5 and type the word you want to use as an example element.

The text for an example element should appear in red.

Using an example element to represent a value

You can use an example element in a selection condition when the value you want to use is stored in a table. The example element stands for whatever value Paradox retrieves.

Example

Suppose you want to know what dive shops in the sample Customer table are located in the same city as the VIP Divers Club. Rather than ask what city that is and then ask what cities match it (a two-query process), you can find the value and all matching values in one query:

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Double-click the Customer table.
- 4 In the Name field of the query image, type “VIP Divers Club”.
- 5 In the City field, press F5 and type “city” as the example element to represent the city where VIP Divers Club is located.
- 6 Press the DOWN ARROW to create a second line in the query image.
- 7 On the second line of the query image, enable the check boxes beside the Customer No, Name, and City fields.
- 8 In the City field on the second line, press F5 and type “city” again to retrieve all records whose City values are the same as the City value for VIP Divers Club.
- 9 Click Query, Run Query.

Using an example element in a range

You can use example elements in queries to retrieve records that match a range of values.

Example

The following query lists all the stock items whose cost is greater than the cost of item number 1320.

	Stock No	List Price
1	900.00	\$2,524.25
2	912.00	\$1,992.00
3	1,313.00	\$287.60
4	1,314.00	\$419.75

The first line of this query retrieves the record that contains Stock No 1320 from the sample Stock table. The cost of item 1320 is represented by the example element cost. The same example element is used in the second line to retrieve all records with a cost greater than the cost of item 1320. The cost of 1320 is \$171.00.

Using an example element in a date condition

You can use an example element in a date expression.

Example

The following query lists all orders that were shipped less than 30 days after order number 1010 (this includes orders that were shipped before order number 1010). Order 1010 shipped on 5/14/91.

	Order No	Ship Date
1	1,001.00	4/5/1991
2	1,002.00	4/15/1991
3	1,003.00	4/23/1991
4	1,004.00	4/28/1991

This query uses

- an example element to represent the shipping date of order number 1010
- an arithmetic expression to calculate the date 30 days after the shipping date
- the < (less than) operator to select the records that have shipping dates earlier than the date 30 days after the shipping date of Order No 1010

Using LIKE or NOT with an example element

You can use example elements with the LIKE and NOT operators.

Example

The following query finds contacts who have been entered more than once in the sample Contacts table with slightly different last name spellings. You could use LIKE to look for alternative-spelling duplicates of each name, one at a time, or you could use LIKE and NOT with example elements to find all alternative-spelling duplicates at once.



	Last Name	First Name
1	Benson	Raymond
2	Benson	Doug
3	Borkes	Vivian
4	Paskon	Leann
5	Wang	Monica
6	Wong	Kathleen

The statement “like name, not name” specifies last names that are like one another and at the same time not exactly one another — just names that have in common at least one-half to two-thirds of the same letters. The space after the comma is not necessary but makes the expression easier to read.

Performing calculations with QBE queries

The CALC operator performs calculations on the information in your tables. Use CALC to

- construct and evaluate mathematical expressions
- combine values from two or more fields
- combine field values with constants
- create a new field with a constant value

CALC capabilities

Using the CALC operator, you can

- specify selection conditions to define the records on which to perform calculations
- type the CALC expression itself in any field of the query image
- use CALC with alphanumeric values and with summary operators
- use values from several tables in a calculation
- use example elements in the CALC expression to refer both to values in the same table and to values in other tables

Rules for using the CALC operator

When you use CALC in a query, the Answer table generated by that query contains an additional field for the calculated result. This means that

- when you create tables, there is no need to include fields for any data that can be calculated from the values in other fields
- the field of the query image in which you choose to type the CALC expression does not matter
- you don't need to check the field in which you enter the CALC expression because the CALC operator always causes Paradox to create a new field in the Answer table. If you do check the field in which you enter the CALC operator, the grouping is changed and the results are altered.

Paradox gives the new field a name based on the calculation. You can use the AS operator to give the calculated field another name.

Using CALC with arithmetic operators

You can use CALC in any field of a QBE query image. After you type the CALC reserved word, you type the expression for the calculation you want to perform.

Expressions can contain

- constants such as 154 or 12/24/91
- example elements such as QTY
- arithmetic operators such as + - * / ()
- summary operators such as SUM or MAX
- comparison operators such as = < > <= >=

Example

Suppose you want to multiply the values of the Quantity (Qty) field in the STOCK.DB table by the values in the List Price field to obtain total costs of the stock you have on hand.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Double-click the STOCK.DB table.
- 4 Enable the Stock No, Part No, Description, Qty, and List Price check boxes in the query image.
- 5 Type an example element in the Qty field (press F5 and type something like “Qty”).
- 6 Type an example element in the List Price field (press F5 and type something like “Lp”).

After you’ve defined the field values you want to work with by placing example elements in the List Price and Qty fields, you can type the CALC expression using these example elements in any field of the query image.

- 7 In any field, type “CALC” and follow this with the example element you’re using for the Qty field; then type “*” followed by the example element you’re using for the List Price field. Your query statement should look something like this: “CALC Qty * Lp”. (You can choose whether or not to type spaces; Paradox disregards them.)
- 8 Click Query, Run Query.

Using CALC with alphanumeric values

You can combine (concatenate) alphanumeric values and constants by using CALC and the + operator.

For example

- you can add “Ms. ” in front of a list of last names when the value in the Sex field is F
- you can use CALC to combine values from the City, State/Prov, and ZIP/Postal Code fields into a single Address field

Creating a new answer field with a constant value

You can create a new Answer table field that contains a constant value (number, date, or alphanumeric) rather than the result of a calculation. Paradox names the new field in the Answer table the same name as the constant value. To name the new field something else, use the AS operator,

as described in “Renaming Answer table fields” on page 326. If the new field is alpha, it has as many character spaces as necessary to hold the constant value.

You can also create a new blank field. In this case, you must type the CALC expression in the same type of field as you want the resulting Answer field — number, short integer, long integer, money, date, or alpha.

To create a field with a number or date constant

- 1 Click in any field of the query image.
- 2 Type the reserved word “CALC”, a space, and the constant number or date value.

To create a field with an alphanumeric constant

- 1 Click in any field of the query image.
- 2 Type “CALC”, a space, double quotation marks, the alphanumeric constant (with respect for case), and end with double quotation marks.

To create a blank field

- 1 Click in any field of the query image that is of the same type as the field you want to create.
- 2 Type “CALC blank”.

Calculating with numeric values from different tables

You can link tables and perform calculations that call on values from different tables in a single QBE query.

Suppose you want to calculate the total dollar value of all currently on-order items based on List Price (in STOCK.DB) rather than on Selling Price (in LINEITEM.DB).

To calculate this information, you must multiply the list price of all items by the quantity of that item ordered.

The following figure shows the results:



Stock No	Part No	List Price	Order No	Qty	Qty * List Price
900.00	T-6180	\$2,195.00	1,000.00	4.00	\$8,780.00
900.00	T-6180	\$2,195.00	1,004.00	3.00	\$6,585.00
900.00	T-6180	\$2,195.00	1,007.00	6.00	\$13,170.00
900.00	T-6180	\$2,195.00	1,008.00	6.00	\$13,170.00
900.00	T-6180	\$2,195.00	1,043.00	4.00	\$8,780.00
900.00	T-6180	\$2,195.00	1,047.00	7.00	\$15,365.00

Create the following example elements by pressing F5 and then typing

- “qty” in the Qty field of the Lineitem query image
- “price” in the List Price field of the Stock query image
- a comma, then the expression “CALC qty * price” (entering Qty and Price as example elements)

Use the Join Tables button to place example elements in the Stock No fields of both query images.

Setting QBE query properties

After you choose the table(s) you want to query, and Paradox displays the query image for the table(s), you can use the Query Properties command to specify how you want Paradox to run your queries and display the results.

Answer table properties

You can specify whether the results appear as an Answer table or live-query view, whether the table type is Paradox or dBASE, and the name and directory of the Answer table. You can also specify the display order of fields in the Answer table. For more information, see “Modifying and renaming the Answer table” on page 324. You can specify which Answer table fields are to be included in a sort and in what order the sort is to be done. For more information, see “Sorting the Answer table” on page 326.

QBE properties

You can specify where queries are to be run (locally, remotely, or either) and whether Paradox creates auxiliary tables for queries that change data (INSERT, DELETE, and CHANGETO queries).

Query defaults or preferences

You can set global defaults for some of these properties and for preferences such as the Default QBE Check Type. These defaults are called preferences and are set with the Preferences command (Tools, Settings menu) on the Query Page of the Preferences dialog box. All preference types can be accessed through Setting system preferences.



- Query properties are saved with the query.

Handling table updates

Table Update Handling settings appear on the Query page of the Preferences dialog box. However, if you want to change these settings temporarily for a single work session, choose commands on the Query menu instead of clicking Query, Properties.

When using Paradox on a network, multiple users can make changes concurrently to a shared table in a shared data directory. You can choose whether you want your Answer table to reflect changes made to the source table(s) of your query while the query is running.

To change table update handling for the current work session

- 1 Click Tools, Settings, Preferences.
- 2 Click the Query tab.
- 3 Enable one of the following table update handling options:
 - Choose Restart On Changes — makes Paradox restart the query when it detects a change to the source table(s).
 - Lock Tables — locks all tables in your query and prevents any changes to the tables while Paradox runs the query. Paradox releases the locks when it finishes running the query. If someone else is already using the table(s) you want to lock and query, Paradox can't place your locks. You'll see a message informing you that a table is locked.
 - Ignore Changes — allows other users to make changes to the source table(s) while Paradox runs your query and prevents Paradox from restarting the query if they make changes. This is the default selection.

Setting auxiliary table properties

The INSERT, DELETE, and CHANGETO queries generate more than an Answer table. For example, CHANGETO queries create a Changed table and

INSERT queries create an Inserted table. It takes time to create these extra tables, and you may not want to create them.

The auxiliary table preferences and properties let you specify whether to create these tables for queries that change data.

To change the default auxiliary table options

- 1 Click Tools, Settings, Preferences.
- 2 Click the Query tab.
- 3 Enable one of the following auxiliary table options:
 - Fast Queries — stops Paradox from generating auxiliary tables when you run queries that change data. When you generate only Answer tables, your queries run more quickly.
 - Generate Auxiliary Tables — produces auxiliary tables when you run queries that change data.

To change auxiliary-table options for the current query

- 1 With the query open, click Query, Properties.
- 2 Click the QBE page.
- 3 Enable one of the following auxiliary table options:
 - Fast Queries
 - Generate Auxiliary Tables

Settings made with the Query Properties command are saved with the query.

Setting remote query properties

When you create a query that uses data from a remote database server, you can choose whether you want Paradox to process the query locally (on your hard drive) or remotely (on the server). Or, you can let Paradox decide how the query can be run most efficiently.

Whether you create a query on local (Paradox or dBASE) or remote (SQL) data, Paradox can translate your QBE statement into valid SQL syntax. This is done automatically when you query remote data. You can view this SQL syntax.

To view SQL syntax

- With the appropriate query open, click View, Show SQL.

If you prefer to write SQL syntax rather than to create QBE statements, you can use the SQL Editor to write SQL statements to be run against local (Paradox or dBASE) or remote (SQL) tables. The only restriction is that QBE must be able to interpret the SQL syntax correctly.

To change the default remote query settings

- 1 Click Tools, Settings, Preferences.
- 2 Click the Query tab.
- 3 Enable one of the following remote query options:
 - Query May Be Local Or Remote — makes Paradox attempt to run the query remotely (on the server). If this fails, Paradox runs the query locally (on your computer).
 - Run Query Remotely — makes Paradox request that the server run the query and send back only the answer data.
 - Run Query Locally — makes Paradox run the query locally. Paradox requests all data in queried tables from the server and runs the query on your desktop system.

To change remote query settings for the current query

- 1 With the query open, click Query, Properties.
- 2 Click the QBE page.
- 3 Enable one of the following remote query options:
 - Query May Be Local Or Remote
 - Run Query Remotely
 - Run Query Locally

Settings made when you click Query, Properties are saved with the query.

Advanced QBE queries: groups, sets, and inclusive links

Paradox can perform a variety of advanced queries on groups and sets of records:

- Work with groups of records using summary operators and other analysis tools.

- Define and compare sets of records to show records that are and aren't part of a set.
- Create and use inclusive links to retrieve all the records in a table, whether or not they match a selection condition.

You can also use Paradox to answer questions about groups of records:

- Select records based on characteristics of a group, such as items that appear in two or more orders.
- Calculate statistics on groups of records, such as the average invoice total of orders placed in each state or province.
- Compare characteristics of a group with other records, such as which of the customers have placed more orders than any customer in Hawaii.

These questions all consider more than one record at a time. No individual record can answer them — you have to look at the group of records.

You can use the summary operators to answer these and other questions about groups of records.

Querying groups of records using summary operators

A summary operator performs an operation on a group of records that you define by checking a field or fields. You specify which records to group by using selection conditions. Paradox has five summary operators:

AVERAGE	Averages the values in a group
COUNT	Counts the number of values in a group
MAX	Finds the maximum value in a group
MIN	Finds the minimum value in a group
SUM	Totals the values in a group

As with Paradox's other reserved word operators, summary operators and summary-operator modifiers are case-insensitive. You can type them in uppercase or lowercase.

Field type limitations

You cannot use summary operators in Paradox BLOB fields or dBASE memo fields. In addition, AVERAGE and SUM cannot be used in alpha, date, time, or timestamp fields. For a complete description of field type limitations when using summary operators, see Paradox field types allowing QBE summary operators in the Reference section of the online Help.

Summary operator modifiers

All of the summary operators except COUNT perform their operations by default on all of the values in a group. COUNT counts only unique values in a group by default. To change the default behavior, apply one of the summary-operator modifiers:

ALL	Considers all values in a group, including duplicates. You must use ALL with COUNT, in the format COUNT ALL, to make COUNT count all values in a group, including duplicates.
UNIQUE	Considers only unique values in a group. You must use UNIQUE with all summary operators except COUNT to make them perform their operation on unique values in a group instead of on all values.

Defining groups

You can use summary operators in combination with the type of check mark you place in the check box beside a field to define groups of data. Check marks (Check, CheckPlus, and CheckDescending) that appear on the same line as a summary operator serve two functions:

- They divide the records into groups based on the values in the enabled field.
- They include the enabled field in the Answer table (their usual function).

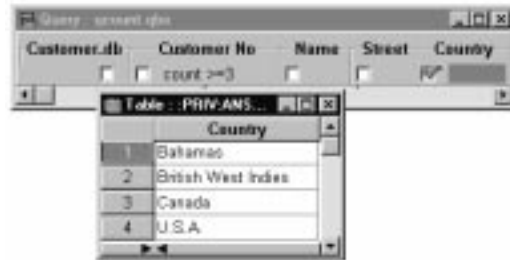
Example of using COUNT: selecting records based on a group count

Use the COUNT summary operator to count unique values in each group.

For example, suppose you want to know which countries have three or more dive-shop customers.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Double-click the CUSTOMER.DB table.
- 4 In the Query window, enable the check box beside the Country field to group the records by country and include the Country field in the Answer table.
- 5 Type "COUNT >=3" in the Customer No field to have Paradox count all the different customer numbers for each group (country) and select groups for which the count is three or more.

- 6 Click Query, Run Query.



The screenshot shows a database window titled 'Query - unsorted.qbm'. It displays a table with columns: Customer No, Name, Street, and Country. Below the table, a smaller window titled 'Table - PRIV-ANS...' shows the results of a query. The results are as follows:


	Country
1	Bahamas
2	British West Indies
3	Canada
4	U.S.A.

Because the Customer No field is the table's keyed field, you know that all customer numbers are unique. The COUNT operator counts unique values by default. If you want to count all values, including duplicates, use COUNT ALL.

Example of using SUM: selecting records based on a group sum

Use the SUM summary operator to sum values within each group in a query.

For example, suppose you want to know which customers have placed orders for which they owe \$5,000 or more.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Hold down CTRL and click the CUSTOMER.DB and ORDERS.DB tables.
- 4 Click the Open button.
- 5  Click the *Join Tables* button, and click the Customer No field of each query image.
- 6 Enable the check boxes beside the Customer No and Name fields of the CUSTOMER.DB query image.
- 7 Type "SUM >5000" in the Balance Due field of the ORDERS.DB query image.

The expression SUM >5000 sums the balance due for each group (customer) and selects those with balances greater than \$5,000.

- 8 Click Query, Run Query.



- If you enable the check box in the Customer No field, Paradox groups the records by customer and includes this field in the Answer table. When you also enable the check box in the Name field, Paradox also groups records by customer name and includes this field in the Answer table. Paradox does not form a different group because there is a one-to-one correspondence between Customer No and Name; both form the same group.

Example of using AVERAGE: selecting records based on a group average

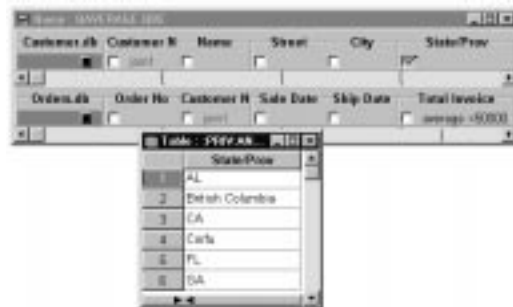
Use the AVERAGE summary operator to average the values in each group in a query.

For example, suppose you want to know the states/provinces in which the average invoice total is less than \$50,000.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Hold down CTRL and click the CUSTOMER.DB and ORDERS.DB tables.
- 4 Click the Open button.
- 5 Click the *Join Tables* button, and click the Customer No field of each query image.
- 6 Enable the check box in the State/Prov field of the CUSTOMER.DB query image to group the table's records by State/Prov values and include this field in the Answer table.
- 7 Type "AVERAGE <50000" in the Total Invoice field of the ORDERS.DB query image to average the invoices for each group (state/province) and select those groups with less than \$50,000.
- 8 Click Query, Run Query.



Your query result would look like this:



Example of using MAX and MIN: selecting records based on a group maximum or minimum

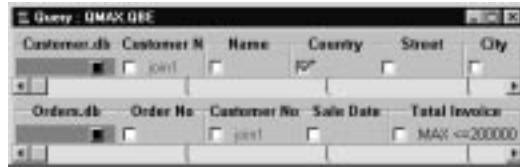
Use the MAX summary operator to find the maximum value in a group. Use the MIN summary operator to find the minimum value in a group. The following example shows a query using the MAX summary operator. You could do the same query with the MIN summary operator to retrieve the minimum value from the same group.

Suppose you want to know the countries in which the highest total invoice is \$200,000 or less.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Hold down CTRL and click the CUSTOMER.DB and ORDERS.DB tables.
- 4 Click the Open button.
- 5 Click the *Join Tables* button, and click the Customer No. field of each query image.
- 6 Enable the check box beside the Country field of the CUSTOMER.DB query image to group the table's records by Country values and include this field in the Answer table.
- 7 Type "MAX <=200000" in the Total Invoice field of the ORDERS.DB query image to find the total invoice for each group (country) and select those which total \$200,000 or less.
- 8 Click Query, Run Query.



Your query result would look like this:



Using the CALC operator with summary operators

In a query, you can calculate new fields for each record, as well as calculate statistics (like total and average) for groups of records. For example, you can ask

- how many of each stock item have been ordered?
- what is the total amount of sales for each customer?
- how many customers live in each country or state/province?
- what are the highest and lowest priced stock items?

Use summary operators with the CALC operator to count, summarize, average, and find the minimum or maximum values in the fields of your tables.

Like all CALC queries, those using groups also create a new field in the Answer table. Paradox automatically names the new Answer-table field according to the group calculation. You can use the AS operator to rename the new field. For information, see "Renaming Answer table fields" on page 326.

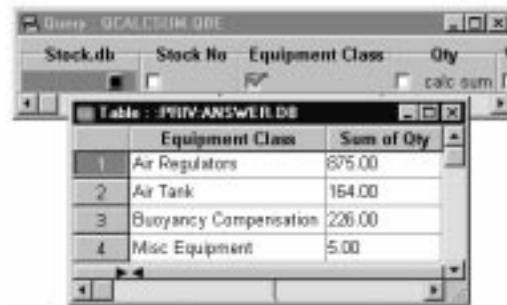
Example of a basic calculation on a group

Suppose you want to know how many of each class of items you have in stock.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Double-click the STOCK.DB table.
- 4 Enable the check box beside the Equipment Class field to group the table's records by equipment classification and include this field in the Answer table.

- 5 Type “CALC SUM” in the Qty field to calculate the sum of the values in this field.
- 6 Click Query, Run Query.

Your query result would look like this:



The screenshot shows a Paradox window titled 'Query: QCALCUM.QBE'. It displays a table with the following data:

	Equipment Class	Sum of Qty
1	Air Regulators	875.00
2	Air Tank	164.00
3	Buoyancy Compensation	226.00
4	Misc Equipment	5.00

Example of performing a group calculation on the entire table

If you do not check any fields in a query, Paradox performs the summary operation or summary calculation on all the records in the table — the whole table is the group.

Suppose you want to know the total number of items ordered, regardless of who ordered them or what they are or cost.

- 1 Click File, New, Query.
- 2 Choose the folder in which your tables are located from the Look In list box.
- 3 Double-click the LINEITEM.DB table.
- 4 Type “CALC SUM” in the Qty field to calculate the total number of items ordered.
- 5 Click Query, Run Query.

Your query result would look like this:



The screenshot shows a Paradox window titled 'Query: QWHOLE.QBE'. It displays a table with the following data:

	Sum of Qty
1	7,102.00

Because no field is enabled, the group is the whole Lineitem table; the only field in the Answer table is the Sum of the Qty field (the result of the CALC SUM operation).

Example of counting unique values

The CALC COUNT query operator counts only unique values. You cannot use COUNT in Paradox BLOB fields and dBASE memo fields. In these field types, CALC COUNT counts all values, even if you specify the UNIQUE operator.

Suppose you want to know how many customers have placed orders with your firm.

- 1 Click File, New, Query.
- 2 From the Samples folder, double-click the ORDERS.DB table.
- 3 Type "CALC COUNT" in the Customer No field.
- 4 Click Query, Run Query.

Your query result would look like this:

The screenshot shows a Paradox query window titled 'Query : QUNIQUE.QBE'. It displays the 'Orders.db' table with fields 'Order No', 'Customer No', and 'Sale Date'. The 'Customer No' field has 'calc count' entered. Below the query window, a small table titled 'Table : :PRIV:ANSWER...' shows the result: 'Count of Customer No' with a value of 55.00.

Count of Customer No
55.00

Because no check boxes are enabled, the whole Orders table is the group; the only field in the Answer table is the Count Of Customer No field (the result of the CALC COUNT operation).

Querying sets of records

In general, a set is a collection of objects. In Paradox, a set is a specific group of records that you intend to query. You can use a SET query to answer a question that might otherwise take two or more queries. Use a SET query when you need to ask questions about the characteristics of a group rather than about individual records. SET queries are particularly useful for revealing trends and patterns in data.

Components of SET queries

Every SET query consists of the following components:

- one or more lines that define a set
- one or more lines, all of which define other records that meet certain comparisons to the set
- optionally, one or more lines that display related information

Guidelines for querying sets

To query a set, follow these general steps:

- 1 Define the set.
- 2 Define groups to compare to the set.
- 3 Select special groups with set comparisons. Use the following set-comparison operators to compare the set to other records or groups of records:
 - ONLY
 - NO
 - EVERY
 - EXACTLY

Using the GroupBy check

Sometimes you might want to group records in a query by the values in a specified field without including those values in the Answer table. To do so, choose the GroupBy check from the menu of checks for the field. You can only use the GroupBy check with SET queries. You cannot use it in BLOB fields.

Defining a set

Defining a set of records in a query is very much like selecting the records to be included in the Answer table. A set definition is a query within a query.

To define a set of records in a query

- 1 Click File, New, Query.
- 2 In the Select File dialog box, select the table(s) you want to query.
- 3 In the query image(s), enter selection conditions that define the records to be included in the set.

If the records are in more than one table, use example elements to link the tables.

- 4 Right-click the left-most field of the query image(s), and click Set.

- 5 Instead of enabling the check boxes beside fields to define them, type example elements.

You must use example elements because lines that are a part of the set definition cannot have their check boxes enabled or contain summary operators. When you compare and retrieve records, you will use these same example elements to link the comparison lines to the set definition.

Example of defining a set

This example uses the sample STOCK.DB table. The single line of this query defines the set of stock items that are Small Instruments, but it is not a complete query. You must still compare the set to another factor.



Performing set comparisons

After you have defined a set in a query, you can compare the set to other records. One way of doing this is to compare groups of records to the set.

You can make set comparisons of two different kinds:

- compare other groups of records to the set
- use the summary operators to compute the SUM, COUNT, AVERAGE, MIN, and MAX of a set's values and then compare the results to values in other records

Paradox provides four special set-comparison operators to define different sets of records.

Operator	Description
ONLY	Displays only records that match members of the set
NO	Displays records that match no members of the set
EVERY	Displays records that match all members of the set
EXACTLY	Displays records that match all members of the set and no others

You can use set-comparison operators in all field types except Paradox BLOB fields and dBASE memo fields.

To form groups of records to compare to the defined set, you use check marks. The method is the same as for summary operators.

Example of performing a set comparison

The Stock query image of this query (created in “Example of defining a set” on page 365) defines the set of stock items that are Small Instruments, but it is not a complete query. To complete the query, add the Lineitem table and enable the Order No check box to display the group of order numbers that contains records that meet the conditions of the set. Now, type the set comparison-operator “ONLY”, followed by the example element item, in the Stock No field of Lineitem. The query looks like this:



This query:

- defines the set of stock items that are of the equipment class Small Instruments
- groups the records in the Lineitem table by order number
- displays the Order No field of the Lineitem table in the Answer table
- compares the group of line items of each order number to the set of stock items that are small instruments, and selects those orders that contain only line items that are only small-instrument stock items

The Answer table shows those order numbers that contain line items that are only of the equipment class Small Instruments.

You can use the NO, EVERY, and EXACTLY set-comparison operators the same way you use ONLY.

Example of the ONLY set comparison operator

The ONLY operator works the same way as summary operators in that it selects groups that contain records with the same value and no others. However, ONLY is not a query summary operator because you cannot use it to perform calculations.

You can use ONLY in all field types except Paradox BLOB fields and dBASE memo fields.

The following example demonstrates another SET query that is almost the same as the SET query in “Example of performing a set comparison” on page 366, except that it includes the Orders table. Both queries produce the

same Answer table. The difference between the two queries is where you define the group of order numbers.

Orders is a parent table to Lineitem and the two tables are linked by their Order No fields; therefore, Lineitem shouldn't have any order numbers that don't exist in Orders. If records with order numbers that don't exist in Orders were present in Lineitem, those records would be orphans — you'd have line items for nonexistent orders. If those orphan records were in Lineitem, their order numbers would appear in the query in Example of performing a set comparison, but not in the query of the following example.

Suppose you want to query the sample tables to see orders placed for the Small Instruments equipment class and no other class of equipment. To create this query, you must select the tables, join the query images, and create the Set comparison.

To select the tables and join the query images

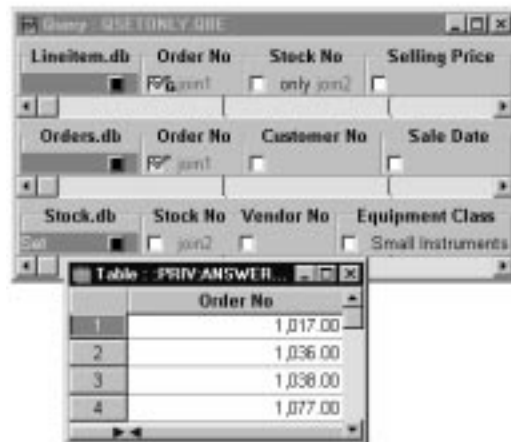
- 1 Click File, New, Query.
- 2 From the Samples folder, hold down CTRL and click the LINEITEM.DB, ORDERS.DB, and STOCK.DB tables.
- 3 Click the Open button.
- 4 Click the *Join Tables* button, and click the Order No fields of the LINEITEM.DB and ORDERS.DB query images.
- 5 Click the Join Tables button and click the Stock No fields of the LINEITEM.DB and STOCK.DB query images.



To create the Set comparison

- 1 Click and then right-click the left-most column of the STOCK.DB query image, and choose Set from the list of query operations.
- 2 In the Equipment Class field of the STOCK.DB query image, type "Small Instruments" to define the set of stock items that are small instruments.
- 3 Enable the Order No. check box of the ORDERS.DB query image to group by the values of this field and display the field in the Answer table.
- 4 Right-click the Order No field of the LINEITEM.DB query image and click the GroupBy check mark from the menu to group by the values of this field but not display this field in the Answer table.

- 5 Type “ONLY” before the example element (join2) in the Stock No field of the LINEITEM.DB query image to have Paradox select only orders placed for Small Instrument stock numbers.
- 6 Click Query, Run Query.



- If you were to run this query without the ONLY set operator and without SET in the left-most column of STOCK.DB, you would get orders placed for Small Instruments in combination with any other equipment-class items.

Performing set summaries

You can compare groups of records to a defined set. You can also compare groups of records to summary values derived from a set. To do this, you define the set as usual. In the line of the query that selects the records to compare to the set, however, you use a summary operator instead of a set-comparison operator. You can place the summary operator in an arithmetic expression.

For example, suppose you want to know which dive shops had total invoice averages that were greater than the total invoice average for a particular dive shop, specifically the Adventure Undersea dive shop. You need to select and link the tables, and then define the query.

To select and link the appropriate tables

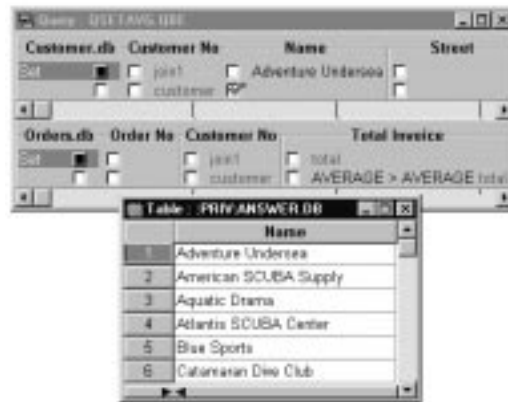
- 1 Click File, New, Query.
- 2 From the Samples folder, hold down CTRL and click the CUSTOMER.DB and ORDERS.DB tables.
- 3 Click the Open button.
- 4 Click the *Join Tables* button, and click the Customer No fields of the CUSTOMER.DB and ORDERS.DB query images.



To define the query

- 1 Click and then right-click the left-most field of both query images and click Set from the menu of query operators.
- 2 In the CUSTOMER.DB query image, type “Adventure Undersea” in the Name field to define the set of dive shops that consists of just Adventure Undersea.
- 3 In the CUSTOMER.DB query image, click the Customer No field and press the DOWN ARROW to add a second line to the field. In the second line of the Customer No field, press F5 and type “customer” as an example element that represents each customer-number value.
- 4 In the second line of the CUSTOMER.DB query image, enable the check box beside the Name field.
- 5 In the Total Invoice field of the ORDERS.DB query image, press F5 and type “TOTAL” as an example element that represents the set of the single-invoice total for the Adventure Undersea dive shop.
- 6 In the ORDERS.DB query image, click the Customer No field and press the DOWN ARROW to add a second line to the field. In the second line of the Customer No field, press F5 and type “customer” as an example element representing each customer number value.
- 7 In the second line of the Total Invoice field in the ORDERS.DB query image, type “AVERAGE > AVERAGE”, and then press F5 and type “TOTAL” to select only those dive shops whose total-invoice averages are greater than the total-invoice average for Adventure Undersea.
- 8 Click Query, Run Query.

Your query result would look like this:



The screenshot shows a QBE query window titled 'Query: QBE.T.ANS.QUE'. It displays two tables: 'Customer.db' and 'Orders.db'. The 'Customer.db' table has fields 'Customer No', 'Name', and 'Street'. The 'Orders.db' table has fields 'Order No', 'Customer No', and 'Total Invoice'. The query result is shown in a table titled 'Table: PIVOTANSWER.DB'. The result table has a header 'Name' and six rows of data.

	Name
1	Adventure Undersea
2	American SCUBA Supply
3	Aquatic Drama
4	Atlantis SCUBA Center
5	Blue Sports
6	Catalonian Dive Club

Querying with inclusive links

QBE Queries that use example elements to link tables together usually retrieve all the records in one table that match records in another table. This type of query represents an exclusive link and is sometimes called an inner join.

To produce an Answer table that includes those records that do not match records in the table to which they are linked, use the Paradox inclusion operator (!). This type of query represents an inclusive link and is sometimes called an outer join.

Add the ! operator to an example element in a query to retrieve all of the records in that table, whether or not they match records in another table. You can also add selection conditions to define the set of master records included in the answer:

- Use multiple inclusion (!) operators to retrieve all the records from more than one table.
- Use ! in a query that contains an arithmetic expression.
- Use both inclusive and exclusive links in the same query.

Selection conditions with inclusive links

You can specify selection conditions for inclusive links just as you can in other queries. This lets you fine-tune either the set of master records or the Lookup table records to be matched with them.

- If you set selection conditions for the master table, the resulting Answer table contains only those records that match the specified selection condition. But the Answer table still contains all of those matching records, whether or not they are matched in the lookup table.

Linking to all records in a table

Sometimes you want all records from one table in a QBE query to appear in the Answer table even if they are not matched in the joined table. This is called an inclusive link and it uses ! (the inclusion operator).

When you use the inclusion operator in one of two tables, that table is the master table. The other table is the lookup table. Paradox first retrieves all records from the master table. It then looks for and retrieves any matching records in the lookup table. The resulting Answer table contains all records from the master table but only matched records from the lookup table.

You can also use the inclusion operator on both sides of the link. For example, in a database that tracks student and course information, you might want to know which students did not sign up for any courses and which courses have no students.



- The choice of which table to put the inclusion operator in is important. That table is the master table and is always processed first. Therefore, two queries that are identical except for the placement of the inclusion operator, can produce significantly different results.
-

Rules for linking tables

You cannot use both an inclusive and an exclusive link in two linked lines.

For any two linked lines in a QBE query, you can use either an inclusive link (!) or an exclusive link to associate them, but you cannot use both. This is because an inclusive link includes all the records from the master table; whereas an exclusive link includes only records whose values in the linked fields match each other. If you use both kinds, Paradox has no way to decide which link to process first. The resulting Answer table would be different depending on the sequence.

You will not violate this rule if you remember that you can use ! with any given example element only once per line and twice per query. In other words, you can use only one type of link to associate any two lines in a query.

You can use an inclusive and an exclusive link in the same query.

You can use both exclusive and inclusive links in the same query as long as they do not both involve the same pair of lines. When you have both types of link in one query, they are processed in order from least to most inclusive:

- 1 Exclusive links, which do not retrieve records that are not matched by records in another table, are processed first.
- 2 Asymmetrical inclusive links (with both master and lookup tables), which retrieve all of the records from the master table but only the matched records from the lookup table(s), are processed next.
- 3 Symmetrical inclusive links (with only master tables), which include all records from both tables, are processed last.

By processing exclusive links before inclusive links, Paradox guarantees consistent results to its queries. If you want Paradox to process the links in some other order, you must break your question into separate queries.

Example of linking to all records in a table

Suppose you want to find out if the Customer table contains customers who have never placed an order. If you link Customer and Orders by placing an example element in both Customer No fields, then check the fields you want to see in the Answer table, you will see only those customer records that match one or more records in Orders.

If, however, you add the inclusion (!) operator after the example element in the Customer No field of Customer, you will see all customer records, including those of customers who have never placed an order. To create this query, you will need to select the appropriate tables, add a new record to the Customer table, and then create the query.

To select the appropriate tables

- 1 Click File, New, Query.
- 2 From the Samples folder, hold down CTRL and click the CUSTOMER.DB and ORDERS.DB tables.
- 3 Click the Open button.

To add a new record to the Customer table

- 1 Click File, Open, Table.
- 2 From the Select File dialog box, double-click the CUSTOMER.DB table.
- 3 Click Record, Go To, Last to move to the last record in the table.
- 4 Press F9 to switch to Edit mode.
- 5 Press the DOWN ARROW to add a blank record to the table.
- 6 Type the following information into the appropriate fields of the table:

Field Name	Data
Customer No	9999
Name	The Human Gill Dive Shop
Street	1225 E. River St.
City	Savannah
State/Prov	GA
Zip/Postal Code	30541
Country	U.S.A.
Phone	404-555-1451
First Contact	5/31/92

- 7 Press F9 to end Edit mode.
- 8 Click File, Close to close the table.

To create the query



- 1 Click the *Join Tables* button, and click the Customer No fields of both the CUSTOMER.DB and ORDERS.DB query images.
- 2 Type “!” after the example element (join1) in the Customer No field of the CUSTOMER.DB query image to include all customers from the Customer table in the Answer table, even if they don’t have a matching record in the Orders table.
- 3 Enable the check box beside the Customer No and Name fields of the CUSTOMER.DB query image.
- 4 Enable the check box beside the Order No field of the ORDERS.DB query image.

- 5 Click Query, Run Query.

If you scroll to the end of the Answer table, you will notice that customers without an Order No entry appear there.

Example of using the Inclusion operator in a QBE query that performs a calculation

You can use inclusion operators in a query that performs a calculation.

For example, suppose you're concerned about orders you can't fill with your current inventory. More specifically, you want a list of all orders and to highlight orders for quantities that exceed one quarter of the quantities in stock. To do this, you need to select and join the appropriate tables and create the query.

To select and join the appropriate tables

- 1 Click File, New, Query.
- 2 From the Samples folder, hold down CTRL and click the STOCK.DB, LINEITEM.DB, and ORDERS.DB tables.
- 3 Click the Open button.
- 4 Click the *Join Tables* button, and click the Order No fields of the ORDERS.DB and LINEITEM.DB query images.
- 5 Click the Join Tables button to place example elements in the Stock No fields of the LINEITEM.DB and STOCK.DB query images.



To create the query

- 1 Type “!” after the example element in the Order No field of the ORDERS.DB query image to see all order numbers.
- 2 Enable the check box beside the Order No field in the ORDERS.DB query image.
- 3 Enable the check boxes beside the Stock No and Qty fields of the LINEITEM.DB query image.
- 4 In the Qty field of the LINEITEM.DB query image, press F5 and type “qty” as the example element that represents all the values, in turn, of the Lineitem table's Qty field.
- 5 In the Qty field of the LINEITEM.DB query image, type “, as Order Qty” after the “qty” example element (from step 4).
- 6 Enable the check box beside the Qty field of the STOCK.DB query image.

- 7 In the Qty field of the STOCK.DB query image, type “< (,” then press F5 and type “qty” and a space and type “* 4), as Stock Qty”.
- 8 Click Query, Run Query.

The ! operator in Orders ensures that the Answer table contains all orders. The qty example element is used in the expression qty * 4 to multiply each stock item quantity value in the Qty field of the Lineitem table (which represents the order quantity of each stock item) by four. The < comparison operator then looks for actual stock quantities that are less than this amount and retrieves records of orders that exceed one quarter of the inventory. Records in the Answer table that contain only an order number are those that do not meet the selection conditions, but are included because the inclusion operator was used.

Inserting, deleting, and changing values with QBE queries

Use DELETE, CHANGETO, and INSERT queries to change the data in a table. These types of queries produce temporary tables which appear in a separate window. The temporary tables hold data that was inserted, deleted, or changed; therefore, you can restore the original table if necessary.

You can combine several operations in a single query. If you do, Paradox performs all DELETES first, then all CHANGETOs, then all INSERTs. You choose INSERT and DELETE from a menu in the left-most field of a query image. You place CHANGETO in the field that contains the value you want to change.

- DELETE—deletes records that match conditions you specify.
- CHANGETO—changes existing values to a new value you specify.
- INSERT—inserts new records from one table into another table.



- The table you change with these queries does not have to be open in a window.
-

Operation order in a query involving multiple operations

You can perform multiple table-changing operations in a single query. If you have more than one query image in a Query window, the only basic requirement for the query to work is that all tables be linked with example elements.

You can, for example, perform a single query that deletes records from one table, inserts records into another table, and changes values in yet another

table. You can also do a query that does an INSERT, DELETE, and CHANGETO operation in a single table.

The following rules describe the order in which Paradox performs queries that involve multiple operations:

- 1 Paradox retrieves records based on all selection conditions.
- 2 Paradox performs any DELETES in the order specified — that is, Paradox looks in the first query image, then the second, and so on.
- 3 Paradox performs any CHANGETOs specified in the order it finds them.
- 4 Paradox performs any INSERTs specified in the order Paradox finds them.
- 5 Paradox displays any temporary tables, including an Answer table, provided you checked any fields in the query image (and have not disabled the Generate Auxiliary Tables button in the QBE page of the Query Properties dialog box (Query menu)).

You can design intricate queries that save you from having to perform multiple, sequential queries. The more operations you design into a single query, however, the harder it becomes for you to undo the query.

Inserting records with QBE queries

Use an INSERT query to insert records from one or more sources into a single target table. INSERT queries let you map which values from your source(s) to insert into fields in your target table.

With INSERT you can insert records from one table type into another; for example, from dBASE to Paradox or Paradox to dBASE tables. For example, you can put

- any numeric data into any numeric field type (Paradox or dBASE)
- alphanumeric or character data into any alpha or character field
- dates into date fields

Fields you leave blank (with no example element) in the target table receive no values from the source table(s). You cannot put example elements in Paradox BLOB or bytes fields or in dBASE memo fields; therefore, you cannot insert these types of values into these types of fields.

Instead of producing an Answer table, an INSERT query produces a temporary table called INSERTED.DB, which includes only the records inserted.

Using INSERT query temporary tables

Paradox generates one or two temporary tables during an INSERT query.

INSERTED.DB

An INSERT query produces a temporary table called INSERTED.DB. As with an Answer table, Paradox saves INSERTED.DB to your private directory, overwrites it each time you run an INSERT query, and deletes it when you exit the program.

To save INSERTED.DB with a different name

- 1 With INSERTED.DB open, click Format, Rename.
- 2 Type a new name in the Rename dialog box.

You can produce an Answer table in addition to the Inserted table if you enable the check boxes of fields on a separate line of the target query image. If you also supply selection conditions on that line, the records in the Answer table will reflect those conditions. However, such an Answer table does not contain any information that has to do with the INSERT operation. For more information, see “Operation order in a query involving multiple operations” on page 375.

You can use the INSERTED table along with DELETE to undo an insertion.

ERRORINS.DB

If you try to insert records that violate the referential integrity of the target table or that violate validity checks established for that table (except picture validity checks), Paradox places the new records into a temporary table called ERRORINS.DB. Those records that do not violate referential integrity or validity checks are placed in INSERTED.DB.



- Paradox does not create the INSERTED table if you have enabled the Fast Queries option in the Query Properties dialog box.
-

Performing an INSERT query

When you perform an INSERT query, Paradox inserts the records from the source into the target table for every field you specified. The source table is not affected by the INSERT query.

If the target table is new, you must create it before you create the query.

To perform an INSERT query

- 1 Click File, New, Query.
- 2 In the Select File dialog box, hold down CTRL and select the appropriate source and target tables.
- 3 Click the Open button.
- 4 Link all tables using example elements.
- 5 For each source table, specify any selection conditions.
- 6 In the target table, place the word INSERT in the left-most column (under the table name) by doing one of the following:
 - Type the letter “i”.
 - Right-click the column and click Insert.
 - Press SPACEBAR, and click Insert.

Do not check any of the fields on the same line as the INSERT operator. If you do, you will get an error.

- 7 Click Query, Run Query.

Example of inserting a record with an INSERT query

Suppose you want to insert a record of literal values into the CONTACTS.DB table using an INSERT query.

- 1 Click File, New, Query.
- 2 In the Samples folder, double-click the CONTACTS.DB table.
- 3 Right-click the left-most column of the CONTACTS.DB query image and choose INSERT from the menu of query operations.
- 4 In the Last Name field, type “Salviola”.
- 5 In the First Name field, type “Dolores”.
- 6 In the Company field, type “Keith’s Dive Shop”.
- 7 In the Phone field, type “404-555-4251”.
- 8 Click Query, Run Query.

Paradox opens the INSERTED.DB table.

If you open the CONTACTS.DB table and scroll to the end, you will see the record you inserted.

Deleting records with QBE queries

Use DELETE queries to remove selected records from a table. DELETE queries are effective when the records to be deleted have something in common that you can specify in one or more selection conditions. DELETE removes only records, not specific field values within records. Use CHANGETO to change or remove specific field values.

Instead of producing an Answer table, a DELETE query produces a temporary table in the Private folder called DELETED, which includes only the records deleted.

Using DELETE query temporary tables

Paradox generates one or two temporary tables during a DELETE query.

DELETED.DB

A DELETE query produces a temporary table called DELETED.DB, which contains only the deleted records. Paradox saves DELETED.DB to your private directory, overwrites it each time you run a DELETE query, and deletes it when you exit the program.

To save DELETED.DB with a different name

- 1 With DELETED.DB open, click Format, Rename.
- 2 Type a new name in the Rename dialog box.

You can produce an Answer table in addition to the DELETED.DB table if you check fields on a separate line of the query image. If you also supply selection conditions on that line, the records in the Answer table will reflect those conditions, as you might expect. However, such an Answer table is not particularly valuable, since it does not contain any information that has to do with the DELETE operation.

Using DELETED.DB to undo a deletion

You can use DELETED.DB, along with INSERT, to undo a deletion. Use DELETED.DB as the source table to insert the deleted records back into the table from which they were deleted. If you are reinserting records you deleted from an unkeyed table, the records are inserted at the end of the table and therefore MAY not necessarily be in their original order.

You can also reinsert the deleted records into the original table by clicking Tools, Utilities, Add. Apart from these two methods, you have no other way of recovering records deleted from a Paradox table.

ERRORDEL.DB

If you try to delete records that violate the referential integrity of the target table or that violate validity checks established for that table (except picture validity checks), Paradox places the new records into a temporary table called ERRORDEL.DB. Those records that do not violate referential integrity or validity checks are placed in DELETED.DB.



- Paradox does not create the DELETED.DB table if you have enabled the Fast Queries option in the Query Properties dialog box.

Performing a DELETE query

Instead of producing an Answer table, a DELETE query produces a temporary table called DELETED, which includes only the records deleted.

To perform a DELETE query

- 1 Click File, New, Query.
- 2 In the Select File dialog box, hold down CTRL and select the table from which you want to delete records, and the table(s) (if any) you want to join to the target table and use to define selection conditions.
- 3 Click the Open button.
- 4 Place the word DELETE in the left-most column (under the table name) of the table whose records you want to delete by doing any of the following in that column:
 - Type the letter “d”.
 - Right-click and click Delete from the menu of query operations.
 - Press SPACEBAR, then choose Delete from the menu of query operations.

Do not enable any of the check boxes on the same line of the query image as the DELETE operator.

- 5 Type any selection condition to select the records to be deleted. You can enter selection conditions in several fields of the same query image or in fields of tables linked by example elements.

Caution: If you do not enter any selection conditions, Paradox deletes all the records from the table.

- 6 Click Query, Run Query.

Example of removing a record with a DELETE query

Suppose Larry's Diving School has gone out of business and you want to remove this dive shop from the CONTACTS.DB table.

- 1 Click File, New, Query.
- 2 In the Samples folder, double-click the CONTACTS.DB table.
- 3 Right-click the left-most column of the query image and choose DELETE from the menu of query operations.
- 4 In the Company field, type "Larry's Diving School".
- 5 Click Query, Run Query.



- You can undo this query by following the steps in "Example of undoing a DELETE query" on page 381.
-

Example of undoing a DELETE query

Suppose you delete George Ahearn, your contact at Larry's Diving School, then decide you want to keep him as a contact for potential dive-shop customers.

The easiest way to undo the deletion in this case would be to click Tools, Utilities, Add, and then add the deleted record in DELETED.DB back into CONTACTS.DB. The following example shows you another way to undo a DELETE. The method you use will depend on the complexity of the deletion you are trying to undo. With any method, you should make copies of the tables at each stage in case you make a mistake in the recovery process and have to undo the change.

Using the Query window from "Example of removing a record with a DELETE query:" on page 381.

- 1 Clear the existing selection conditions in the CONTACTS.DB query image by pressing CTRL + DEL in any field of the image.
- 2 Add the Deleted.db query image to the Query window.
- 3 Click the *Join Tables* button, and then click in each pair of matching fields in CONTACTS.DB and DELETED.DB.
- 4 Right-click the left-most column of CONTACTS.DB, and click INSERT from the menu of query operations.



- 5 Click Query, Run Query.

If you open the CONTACTS.DB table and scroll to the end, you will see George Ahern's record has been added to the table.

Changing values with QBE queries

Use CHANGETO queries to change specific field values in a table based on conditions you specify in a query. CHANGETO provides you with a kind of global search-and-replace capability. It is particularly useful when you want to change many values that have something in common.

Instead of producing an Answer table, a CHANGETO query produces a temporary table called CHANGED.DB, which contains a copy of the records as they existed before you changed them.

Using CHANGETO query temporary tables

Paradox generates one or two temporary tables during a CHANGETO query.

CHANGED.DB

CHANGETO produces a temporary table called CHANGED.DB, which contains a copy of the records as they existed before you changed them. Paradox saves CHANGED.DB in your private directory, overwrites it each time you run a CHANGETO query, and deletes it when you exit the program.

To save CHANGED.DB with a different name

- 1 With CHANGED.DB open, click Format, Rename.
- 2 Type a new name in the Rename dialog box.

You can produce an Answer table in addition to the CHANGED.DB table if you check fields on a separate line of the query image. If you also supply selection conditions on that line, the records in the Answer table will reflect those conditions, as you might expect. However, such an Answer table is not particularly valuable because it does not contain any information that has to do with the CHANGETO operation.

You can use CHANGED.DB to undo changes made with CHANGETO.

ERRORCHG.DB

If you try to change records in a way that violates the referential integrity of the table or that violates validity checks established for that table (except picture validity checks), Paradox places the new records into a temporary table called ERRORCHG.DB. Only those records that do not violate referential integrity or validity checks are placed in CHANGED.DB.



- If you enabled the Fast Queries option in the Query Properties dialog box, Paradox does not create CHANGED.DB.

Performing a CHANGETO query

Instead of producing an Answer table, a CHANGETO query produces a temporary table called CHANGED.DB, which contains a copy of the records as they existed before you changed them.

To perform a CHANGETO query

- 1 Type the value you want to change in the appropriate field of the query image.
- 2 After the value you want to change, type a comma (,).
- 3 After the comma, type “CHANGETO” and a space. (As with all of Paradox’s operators, you can type it in uppercase or lowercase.)
- 4 After CHANGETO and the space, type the new value to which you want to change the current value.

You can also type selection conditions in other fields to specify further which records to change.

The CHANGETO operator must be on the same line in the query image as any selection conditions. Do not enable any of the check boxes on this line of the query image.

- 5 Click Query, Run Query.

Paradox changes all records that meet the selection conditions.

Undoing changes using the Changed table

Use the Changed table to verify that the correct records have been changed. If you changed records that you did not mean to change, you can delete the changed records from the queried table and reinsert the original records back into the table from CHANGED.DB.

To undo changes using the Changed table

- 1 Run a DELETE query on the table whose records you accidentally changed, by using the new field value(s) — the one(s) you changed to — as the selection condition(s).

This removes the incorrect records.

- 2 With CHANGED.DB as the source table, and the original table as the target table, use an INSERT query to insert the deleted records back into the original table.

This action restores the queried table back to its original state. If you are reinserting records into an unkeyed table, Paradox inserts them at the end of the table. Therefore, the records may not be in their original order.



- For information about running a DELETE query, see “Performing a DELETE query” on page 380.
- For information about running an INSERT query, see “Performing an INSERT query” on page 377.

Performing a multi-table CHANGETO query

You can create a CHANGETO query to change the records in one table to match the records in another table that is linked through referential integrity.

To perform a multi-table CHANGETO query

- 1 Click File, New, Query.
- 2 In the Samples folder, hold down CTRL, click both the master and detail tables, and click the Open button.
- 3 Click the *Join Tables* button, and then click the matching fields of both query images.
- 4 In the query image of the parent table, type “CHANGETO” and a space before the example element in each field that you want to change.
- 5 Click Query, Run Query.



Paradox changes the values of the appropriate fields of the master table to match those of the detail table.

Example of using CHANGETO with example elements

You can use a CHANGETO query with example elements to perform a calculation on values in a field and to change the original values to the new calculated values in the same field. (If you were to perform calculations using the CALC operator, Paradox would create a new field to hold the results in an Answer table and would leave the original values unchanged.)

This query increases the list price of all stock items in the Stock table by 15%. In the query image, ListPrice is an example element that represents the value in the List Price field.

Query: UPDATE STOCK.DBF
 Stock.dbf Stock No Vendor No List Price
 ListPrice, changes ListPrice*1.15

Table - STOCK.DBF

	Stock No	Vendor No	Qty	List Price
1	900.00	3,820.00	8.00	\$2,195.00
2	912.00	2,814.00	5.00	\$1,680.00
3	1,313.00	3,511.00	165.00	\$290.00

Table - Stock.dbf

	Stock No	Vendor No	Qty	List Price
1	900.00	3,820.00	8.00	\$2,524.25
2	912.00	2,814.00	5.00	\$1,932.00
3	1,313.00	3,511.00	165.00	\$337.50



WORKING WITH DESIGN OBJECTS

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8

Design objects are the fields, buttons, and other attributes you see when you open a design document in Paradox. A design object can be a simple visual attribute, such as a box or line, or it can be a data entry tool, such as a field. Design objects let you enhance the functionality and effectiveness of the forms and reports you create. For example, a button object can be programmed in ObjectPAL to move forward or backwards through table records.

Paradox provides a wide variety of design objects to enhance the appearance and functionality of your design documents:

- boxes, ellipses, and lines to add graphic elements to your design
- button objects to send commands to Paradox
- chart objects to display information graphically
- crosstab objects to summarize information according to one or more graphics
- field objects to display data from tables on which the form or report was built
- calculated field objects to perform calculations on the values of one or more fields
- graphic objects to place bitmap images in a form or report
- multi-record objects to display several records at one time

- notebook objects to organize large forms
- ActiveX and native Window controls, enable objects from Paradox to contain data from another application
- table frame objects for viewing all or part of a source table
- text objects to add titles, labels, and provide instructions

In various instances, design object properties may be modified to suit specific requirements. You can change an object's visual properties, such as size, color, or text style. You can also control the way an object behaves when you run your design document.



- To find out more about adding ObjectPAL methods to design objects, see the ObjectPAL online reference.
 - For a list of object properties, functions, and ways to modify objects, see Object property reference in the General Reference section of the online Help.
-

Boxes, ellipses, and lines

Paradox provides three drawing tools — the Box, Ellipse, and Line — that you can use to add graphic elements to your design.



Use the Box tool to create squares, rectangles, and boxes.



Use the Line tool to draw horizontal, vertical, or diagonal lines.

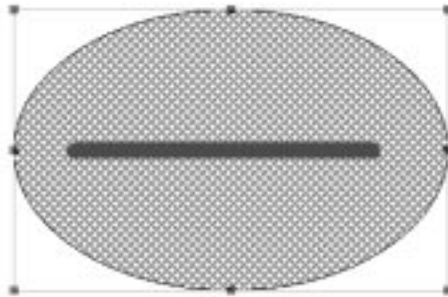


Use the Ellipse tool to create circles and ellipses.

Using boxes and ellipses to keep design objects together

When a box or ellipse completely surrounds the borders of another object, the object within the box or ellipse is “contained.”

.....
An example of a
contained object. The
line is contained
inside the ellipse.
.....



Contained objects

- move when you move their containers
- are deleted when you delete their containers
- are duplicated with the container as a group when you use the Duplicate command (Design menu)

Deleting objects within a box or ellipse

If a box or ellipse surrounds an object, and you want to delete the box or ellipse but not the object that it contains, make sure the Contain Objects property for the box or ellipse is disabled.



- For more information about the properties available to boxes, ellipses and lines, see the Object property reference in the online Help.

Placing a box on a form or report

Place a box around objects to give them frames, or use a box alone for visual impact. You can surround objects with a box by dragging a box around existing objects or by dragging existing objects into a box. You can customize boxes to get just the look and functionality you want.

To place a box on a form or report



- 1 Click the *Box tool*.
- 2 Click one of the following:
 - To create a box with the default size, click the area of the form or report where you want to place the box.

- To create a box of any size, click the area of the form or report where you want to place the box and drag to size the box.
- 3 Click and drag any of the eight handles that surround the box to create the desired shape.

Placing an ellipse on a form or report

Place an ellipse around objects to give them frames, or use an ellipse alone for visual impact. You can surround objects with an ellipse by dragging an ellipse around existing objects, or by dragging existing objects into an ellipse. You can customize ellipses to get just the look and functionality you need.

To place an ellipse on a form or report



- 1 Click the *Ellipse tool*.
- 2 Click one of the following:
 - To create an ellipse with the default size, click the area of the form or report where you want to place the ellipse.
 - To create an ellipse of any size, click the area of the form or report where you want to place the ellipse and drag to size the ellipse.
- 3 If you release the mouse button and the ellipse is not the desired size or shape, click and drag any of the eight handles that surround the ellipse.

Placing a line on a form or report

You can place the following types of lines on your forms:

- Straight lines at any angle
- Curved lines
- Lines with arrows on the ends (only applies to straight lines)

You can customize lines to get just the look and functionality you want.

To place a line on a form or report



- 1 Click the *Line tool*.
- 2 Click one of the following:
 - To create a line at its default size, click the area of the form or report where you want to place the line.

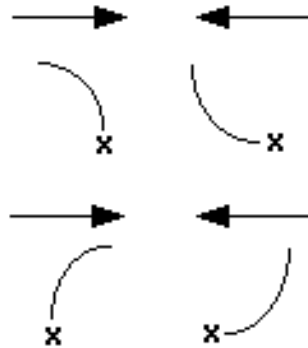
- To create a line of any size, click the area of the form or report where you want to start the line and drag to size the line.
- 3 If you release the mouse button and the line is not the desired size or shape, click and drag any of the eight handles that surround the line.

To create a curved line

- 1 Right-click the line, click Properties.
- 2 In the Properties dialog box, click the Style page.
- 3 Enable the Curved button.
- 4 Click OK to return to the form or report.
- 5 Drag an endpoint to adjust the angle of the curve.

The direction of the curve depends on the direction in which you draw the line, on which endpoint you drag, and on the direction you drag the endpoint.

In the following figure, each curved line was drawn in the direction of the arrow above the line. The X shows the endpoint that was dragged to make the curve.



Experiment by dragging either endpoint to get the effect you want.

To straighten a curved line

- 1 Right-click the line, click Properties.
- 2 In the Properties dialog box, click the Style page.
- 3 Enable the Straight button.

To add arrows to straight lines

- 1 Right-click the line, click Properties.

- 2 In the Properties dialog box, click the Style page.
- 3 Enable one of the following buttons:
 - No Arrow—removes arrows from a line.
 - Arrow On One End—places an arrow on the end of the line. The arrow points in the direction you dragged to create the line.
 - Arrow On Both Ends—places arrows on both ends of the line.

Button objects

You can create buttons on a form and then use ObjectPAL to associate a method with the button. The user clicks the button to initiate the operation you defined in the ObjectPAL method.

Paradox allows you to create three types of buttons.

Button type	Appearance and Function
Push	This is a rectangular button that carries out attached ObjectPAL code when clicked. You can use the button expert to attach code to a button, or, for more advanced code, you can manually program the button through the Object Explorer. This is the default button type.
Radio	This is a labeled round or diamond-shaped button that provides the user with two options. Every time this button is clicked, its value is toggled between true and false.
Check Box	This is a labeled square button that indicates a yes/no state. Each time the user clicks the button it toggles between yes/true or no/false.



- Buttons are available only in forms, not in reports.

Placing a button on a form

You place a button on a form using the button tool. After you add a button to your form, a text object appears on top of the button to allow you to add a label. You can also delete the label and use the Graphic tool to place a picture or icon on the button.

To place a button on a form

- 1 Open a form in the Design Window, click the Button tool.
- 2 Click the form to place the button at its default size, or click and drag to place the button and specify its size.

To change the label

- 1 Click the text object.
- 2 Click again to place the insertion point in the text object.
- 3 Type the new label.

To delete the label

- 1 Select the text object.
- 2 Click Edit, Delete.



- Paradox automatically centers the text on the button. If you don't want the label centered on the button, right-click the button, click Properties, and disable the Center Label check box on the General page.
 - If you move the label, you will automatically disable the Center Label option; you must then enable this option manually if you want to center the label.
-

Choosing a button type

A button's type controls its functionality. By default, a button is a standard push button. You can also create a radio button or check box. See "Button objects" on page 392 for a description of the three button types.

You can create a group of radio buttons or a check box from a field object. The advantage of using a field instead of a button is that a field object (the button or check box the user chooses) can post a value to the table to which the form is bound. Clicking the button posts the value to the table.

To choose a button type

- 1 Open a form in the Design Window.
- 2 Right-click the button, click Properties.
- 3 Click the General page of the Properties dialog box, choose Button Type and enable one of the following buttons:
 - Push Button — creates a labeled rectangular button that carries out an action described by an ObjectPAL method. When the button is pressed, its value is "True." When the button is not pressed, its value is "False." Push is the default Button Type.

- **Radio Button** — creates a labeled round or diamond-shaped button that provides an option. Each time a user clicks the button, it toggles between being empty and being darkened. Each click also toggles its value between “False” and “True.”
- **Check Box** — creates a labeled square button that indicates a yes/no state. Each time a user clicks the button, it toggles between being enabled and disabled. Each click also toggles its value between “False” and “True.”



- See Button type properties in the Object property reference in the online Help for more information about button types.
-

Choosing a button style

A button’s style controls its visual display. You can customize the style of radio buttons or check box buttons.

To choose a button style

- 1 Open a form in the Design Window, right-click the button and click Properties.
- 2 Enable the Radio Button button, or the Check Box button on the General page of the Properties dialog box.
- 3 Enable one of the following:
 - The Borland button to create radio buttons and check boxes that have a three-dimensional, raised look. Radio buttons are raised gray diamonds; check boxes are raised gray squares.
 - The Windows 3D button to create radio buttons and check boxes that look like the ones you see in many Windows products. Radio buttons are gray three-dimensional circles; check boxes are squares.



- See Style property in the Object property reference in the online Help for more information about button styles.
-

Editing button events and methods

You can use ObjectPAL to edit existing events and methods, or you can add new methods to the button. This is how you assign functionality to the button. The user clicks the button to initiate the operation you defined in the

ObjectPAL method. For example, you could add a method to a button that tells Paradox to print a specific report, move to a specific record, or find a certain value when you push the button.

To edit button events and methods

- 1 Right-click the button, choose Object Explorer.
- 2 Click on either the Method or Events page.
- 3 Edit one or more ObjectPAL methods or events for the button.

Chart objects

Charts can show you the overall view of your data. They can reveal trends and patterns and show how different parts contribute to a whole. You can use charts to draw conclusions quickly and to see relationships in your data that you might otherwise miss. They expose “hidden” information in your tables by

- breaking it into categories you specify
- summarizing the data within those categories
- sorting the summarized information



- See “Working with charts” on page 285 for more information charts and their properties.
-

Placing a chart on a form or report

To place a chart on a form or report, you use the chart tool. You make the chart any size.

To place a chart in a form or report

- 1 Open a form or report in the Design Window, click the Chart tool.
- 2 Click the area of the form or report where you want to place the chart.

An empty tabular chart object appears with undefined x-axis, y-axis, and charted data.
- 3 Drag the sizing handles to resize the chart.

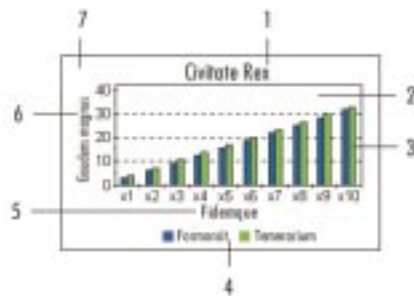


- In a report, the scope of a chart is determined in part by the section of the report in which it is placed.
-

Changing chart properties

Each part of a chart has unique properties, and the chart object as a whole has properties. See the Object property reference in the online Help for more information about specific chart properties.

To change chart properties



- 1 Right-click the title area to define or customize the display of the title.
- 2 Right-click the background to format its display.
- 3 Right-click the series to define the y-value for each series.
- 4 Right-click the legend to format its display and position.
- 5 Right-click the x-axis to define the field required to form the series along the x-axis.
- 6 Right-click the y-axis to define the fields forming the y-axis.
- 7 Right-click the upper left corner of the chart to define the chart object as a whole.



- Handles do not appear around the separate chart areas when you select them. This is because you cannot move the individual components of the chart object. However, the cursor changes to an up arrow when you pass over an area of the chart that can be modified.
-

Crosstab objects

A crosstab is a data analysis tool that summarizes (cross-tabulates) information according to one or more categories.

The categories on a crosstab are fields. The summarized data for a crosstab is created by a query. Because crosstabs automatically create and run queries, it is not necessary to define a query to create a crosstab. It is, however, a way to understand the type of information a crosstab can contain.



- See “Working with crosstabs” on page 299 for more information about crosstabs and their properties.
-

Placing a crosstab on a form or report

When you place a crosstab on a form or report, the crosstab uses the data model of that form or report.

To place a crosstab in a form or report



- 1 Open a form or report in the Design Window, click the *Crosstab tool*.
- 2 Click the form or report to create a crosstab at its default size, or click and drag to size the crosstab.

An empty crosstab object appears with undefined fields in the row header, column header, and first summary area.

Changing crosstab properties

A crosstab object is a composite object made up of:

- fields
- row area
- column area
- summary area

Each part of a crosstab has unique properties, and the crosstab object as a whole has properties.

To change properties of the entire crosstab

- Open a form or report in the Design Window, right-click the upper left corner of the crosstab and click Properties.

To change properties of a portion of the crosstab

- Open a form or report in the Design Window, right-click a portion of the crosstab and click Properties.

Field objects

You can place a field from a Paradox table on a form or report. Field objects display data from the tables(s) on which the form or report is built. In the Design Window, you do not see the data in the field. When you run the form or report, Paradox displays the field's data in the field object.

When you create a form or report and choose any layout other than blank from the Design Layout dialog box, Paradox places the fields from your table in the design. You can place more fields on the design.

Field objects in reports

In reports, you must follow certain rules when you place field objects in multi-table report designs.

- If the field object is defined as a field of the master table, you can place it in any band.
- If the field object is defined as a field of the detail table, it must be placed within the detail table's repeating region (a table frame or multi-region object).



- See the Object property reference in the online Help for more information about the properties associated with fields.
-

Placing a field on a form or report

You can place a field on any form or report. You must define the field so that it is linked to a field on a table in your data model. When you run the form or report, Paradox displays the data from that field of the table for each record you display.

Placing a field object

Depending on the properties of the tool, the field may be a labeled field, an edit field, a list box, combo box, a radio button, or a check box. You can also place a field that is not available from the menu (such as a summary field, a special field, or a calculated field), or you can leave the field undefined.



To place a field object

- 1 Click the *Field tool* on the tool bar.
- 2 Click to place the field object using its default size, or click and drag to place the field object and specify its size.

By default, Paradox creates a labeled field object, which consists of the label (a text object) and the edit region in which the field's data appears.

To define the table field you want to display

- 1 Right-click the field object and choose Define Field.

The Define Field Object dialog box displays a list box of each table used in the form.

- 2 Choose a field from the appropriate table's list box.



- To define a field, the form or report must be connected to a data model.

Using the Field Palette

The Field Palette allows you to quickly add table fields to a form or report. It contains the names of all the tables in your working directory. When you choose a table from the list box, the bottom panel of the Field Palette displays all of the fields in that table.

To open the Field Palette

- Open a form or report in a Design Window, click View, Field Palette.

To add a field to a form or report using the Field Palette

- 1 Choose a table from the Field Palette list box.
- 2 Drag the field from the list to your form or report.

Paradox adds the field to the form or report. If you add a field from a table that is not already part of the form's or report's data model, Paradox prompts you to confirm adding the table to the data model.



- Once you add a field, you can define the field and set its properties.

Specifying the functionality of a field object

There are six types of field objects: Combo fields, List fields, Edit fields, Radio Button fields, Check Box fields, and Toggle buttons.

Combo field objects

When users enter data using a list-box field, they can either type a value in the edit region, or choose the data value from a list box. Use a list box field object to provide users with a quick way to enter data into a field that has a limited number of valid values. When you create the field object, you specify the valid values in the Define Values dialog box; users pick from these values when they enter data while running the form.

For example, if you create a data-entry form for the Orders table and you know of six common values for the Payment Method field, you can display these values in a list-box field object.

These field objects are unavailable in reports.

List field objects

A list field offers users a list of values from which to choose. Users choose from the list to select a value and can only select values that are listed. Only one value can be selected at a time. Use a list-field object to provide users with a quick way to enter data into a field that has a specific number of valid values. When you create the field object, you specify the valid values in the Define Value dialog box; users pick from these values when they enter data while running the form.

For example, if you create a data entry form for the Orders table and you know that only five values are valid for the Ship Via field, you can display these values in a list-field object.

Edit field objects

A field where the user can view or enter data. To view values of a table, the form or report must be connected to a data model. This is valuable to users who want to view a specific field one record at a time. Instead of selecting the records from a list, use the navigation buttons to move through the records.

When you create the edit field, you specify the values in the Define Value dialog box; users pick from these values when they enter data while running a form. Editing the label does not change the value in the field; you must alter the field in the Define List dialog box.

Radio Button and Toggle Button field objects

Radio buttons and toggle buttons perform the same functionality. Both offer users a list of values from which to choose. Users enable a button to select a value from the list. Use these field objects to provide users with a quick way to select data from a field that has a specific number of values.

When you create the field object, you specify the valid values in the Define List dialog box; users pick from these values when they enter data while running the form. Changing the label of a button in the Design Window does not alter the field's value. You must alter the value in the Define List dialog box.

Check Box field objects

A check box has two states: enabled and disabled. The user enables the check box, an X appears in the box; when disabled, the box is blank. The field has one value when enabled another value when disabled. The check box values are defined in the Check Box Values dialog box. A logical field type is a perfect candidate for a check box display type. It's also a good idea to create a default validity check on the logical field and to specify False as the default value.

For all fields other than logical fields, any values can be entered for the check-box values. True and false must be used as the values in a logical field. Changing the label of a check box in the Design Window does not alter the field's value. You must alter the value in the Check Box Values dialog box.

For example, suppose you design a form using the Vendors sample table. The Preferred field, a logical field, indicates whether the vendor has preferred status or not. You could define the field as a check box, and define the values for the check box as "true" when enabled and "false" when left blank. If the user enables the box, "true" is entered into the table's field for that record. If the user leaves the box disabled, a "false" value is entered.

Specifying a field object's display type

You can choose from labeled, edit, combo, list, radio button, or check box field object.

To specify a field object's display type

- 1 Open a form or report in the Design Window.
- 2 Right-click the field and click Properties.
- 3 Click the General page.
- 4 Choose an option from the Display type list box.

- 5 Click Define Values.
- 6 Type one of the following:
 - In the Define List dialog box type the values that you want to appear in the field and press ENTER. Repeat for each additional value.
 - In the Check Box Values dialog box type the values you want the box to have when checked or unchecked.

To change the values for a field object

- 1 Follow steps 1 and 2 from the above procedure.
- 2 Choose the appropriate type of field from the Display Type list box on the General page of the Properties dialog box.
- 3 Click Define Values.
- 4 In the Define List or Check Box Values dialog box, type in new values for the object.



- If you change display types from an unlabeled field to a labeled field without enabling the Size To Fit check box on the Design page of the Properties dialog box, the field remains the same size and the label object and field object compete for space. When you enable Size To Fit, the field object expands to accommodate the new label.



- See Display Type property in the Object property reference in the online Help for more information about field display types.

Changing a label without changing the field value

For radio-button and check-box field objects, the values you define as choices for the fields are those that Paradox enters in the table when a user enters information by using that form. The default labels on the form match these values. However, you can change the labels on the form without changing the values the user can select. The labels are standard text objects on the form.

To change the labels after defining the values

- 1 Open a form or report in the Design Window.
- 2 Select the text label on the object by clicking the text until a flashing cursor appears.
- 3 Type the text for the label.

- 4 Without clicking again (the insertion point is still inside the text), move the mouse to any of the borders of the text box. Stop when the cursor changes to a double-headed resizing arrow to indicate the direction you can drag.
- 5 Click and drag in the indicated direction to resize the text area.

Special fields

A special field in a form or report contains information about the table or about the design as a whole. It is not a field of a table.

Table

The special fields that relate to a table are:

- <Table Name> (The table's name)
- <Record Number> (The current record number)
- <Number of Records> (The number of records in the table)
- <Number of Fields> (The number of fields in the table)

These fields are found on the master-table list box and are displayed in brackets, for example, <Table Name>.

Design

The special fields that relate to the design as a whole are:

- Date (Today's date)
- Now (The current time)
- Page Number (A page number)
- Timestamp (The current time and date)
- Number of Pages (The number of pages in the form or report)

These special fields are found in the Define Field Object dialog box on the list box in the Special Field area.

Placing a special field on a form or report

Although a special field is created just like any other field, it cannot be edited the way other fields can. Its purpose is to display information about the form or report, not to be an editing tool.

To place a special field on a form or report



- 1 Open a form or report in a Design Window.
- 2 Click the *Field tool*.
- 3 Click in the design area to create the field object.
- 4 Right-click the field object and click Define Field.
- 5 Choose one of the following:
 - For a field related to the table, choose a field from the list box that contains the name of the table. These special fields are bracketed at the bottom of the list, for example, <Number of Records>.
 - For a field related to the design, choose the appropriate field from the Special Field list box.



- To define a field, the form or report must be connected to a data model.

Summary fields

A summary is a type of field calculation in forms and reports. You can use summaries to sum, count, or average the values in a field. You can find the minimum, maximum, standard deviation, and variance of values in a field. If you want a field to calculate a value based on more than one field, you will require a calculated field. See “Calculated field objects” on page 412 for more information.

Paradox has the following summary operators:

Summary	Description
Sum	Sum of non blank values to use with number types.
Count	Number of non blank values to use with all data types.
Min	Minimum value to use with alpha, number, money and date data types.
Max	Maximum value to use with Alpha, number, money and date data types.
Avg	Divides the total of all non null values by the number (count) of all non null values to use with number data types.
Std	Standard deviation of values to use with number data types.
Var	Statistical variance of values to use with number data types.
First*	First value to use with all data types.

Last*	Last value to use with all data types.
Prev*	Previous value to use with all data types.

* These operators are not available in forms.

Normal, cumulative, and unique report summaries

When you create a report, you can choose from the following types of summaries. These options appear below the list of summary operators in the Define Field Object box.

- Normal — considers all non null values in the set, including duplicates.
- Unique — counts only unique non null values in the set. Duplicates are ignored. If you use a unique summary to perform a Sum or Avg function, you will not obtain true results because some values (duplicates) are not considered when the operation is performed.

A common use of a unique summary is to count all unique values in a set. For example, how many different types of items does a certain customer order?

- Cumulative — keeps a running total that extends from the start of the report to the end of the current set, instead of from the beginning of the current set to the end of the current set. For example, if you place a cumulative Sum summary on a Balance Due field, Paradox initially sets the value to zero, and then keeps a running total from the start of the report through to the end of the report.

Summary scope

A summary performs a calculation on a set of records. Before you can perform an operation on the set, you must define the set by defining the scope of the summary. The scope specifies on which values you want the summary to operate.

Forms

- In a single-table form, Paradox works with only one set of data. In this case, the scope of the summary is the whole table.
- In a multi-table form, the scope of a summary depends on the data hierarchy. The hierarchy is defined by the form's data model.

Example of creating a summary scope on a multi-table form

Suppose you have defined your data model as follows:

Customer → Orders → Lineitem

You can summarize values for fields in the Orders table for each record in the Customer table. In this relationship, Customer is the master table and Orders is the detail table. Paradox sums the set of Orders detail records for the current Customer record.

Likewise, you can summarize values in the Lineitem table for the current record in the Orders table. Again, the master table (Orders) determines the scope of a summary on the detail table (Lineitem). The summary of Lineitem is performed on the set of all items for the current customer's current order.



- In the data model Customer → Orders → Lineitem, you cannot create a summary of each customer's lineitems — only of each order's lineitems. Paradox can move up only one level in the data hierarchy when performing a summary.
- When placing a summary field on a set of detail records in a one to many relationship in a form, you must position the summary field within that detail's repeating region (the table frame or multi-record object that displays its records) or within the repeating region of the next table up in the data hierarchy.

Reports

- Both the report's data model and the placement of the summary field in the report design determine the scope of a report's summary.

Summary scope on single-table reports

When you place summaries in a single-table report, location affects the scope as follows:

- Corresponding band headers and footers calculate to the same value. This means you can place a summary in either the report header or report footer and get the same result. Likewise, a calculation in either the page header or page footer yields the same result.
- In a table frame, the scope of the calculation is over all records in the table (if it is a detail table, the scope is all records in the detail set).
- In a report band (either the header or the footer area), the scope of the calculation is all values contained by the report band — all records for the table.

- In the page band (either the header or the footer area), the scope of the calculation is all values contained by the page band — all records on the page.
- In a group band (either the header or the footer area), the scope of the calculation is all values contained by the group band — all records for the group.

In a record band, a summary will behave differently in different situations. In a report without a group band, Paradox performs the summary on all records in the table. In a report with a group band, Paradox performs the summary on all records in the group. In a tabular or multi-record report, if the Run Time property Show All Records of the table frame (or multi-record object) is disabled, Paradox performs the summary on the number of records that fit in the table frame or multi-record object. In this case, the table frame or multi-record object acts as if it were a band defined as a number of records.

Summary scope on multi-table reports

When you place summaries in a multi-table report, location affects the scope as follows:

Summaries on master tables

When you place a summary field on the master table of a multi-table report, the scope of the summary is the innermost group of data.

When you place a summary field in the record band of a report based on tables with a one-to-many relationship, the summary can calculate only on the current record of the master table. In this case, the current master record behaves like a group band and groups the detail records.

When Paradox works with a data model that contains one-to-many or many-to-one relationships, Paradox joins the two tables in the data model before it performs the summary, and then treats the joined tables as a single table.

Summaries on detail tables

When you place summaries on the detail table of a multi-table report, the record, page, and group band rules for summaries on single-table reports remain true. In addition, if you place a summary in the record band, Paradox performs the summary on all detail records of the current master record. If you embed a summary within a table frame or multi-record object defined as the master table, Paradox performs the summary on each record of the master table.

Summaries on unlinked tables

When you place a summary on an unlinked table in a multi-table report, the sum is performed for the whole table.

Defining a summary

A summary performs specific calculations on a specific set of values in a table. The set of records over which the summary is made is called its scope. The scope is determined by the location of the summary field in the form or report.

To define a summary

- 1 Right-click the field on which you want to perform the summary operation, and click Define Field.
- 2 In the Table list box, choose the field on which you want to perform the summary operation.
- 3 Choose the appropriate summary type from the Summary list box.

Returning a summary value relative to a particular report page

In a report that uses tables linked by a one-to-many relationship, if you want to perform a summary operation which is relative to a page and based on a field in the detail table, you may need to link the tables backward in the data model.

For example, if your report is based on two detail tables, you may have more than one page of detail data. Because of the links, Paradox automatically groups the records in the detail table. Summary operations on a field within a group do not respect page breaks and return a value for the group, not for each page on which the grouped data appear.

The solution is to link from the detail table to the master table. There will be no inherent grouping by Paradox. You can then group on a particular field, or even a set number of records, and have a summary value returned relative to a particular page.

To return a summary value relative to a particular page

- 1 In Design mode, click Format, Data Model.
- 2 Choose the details table in the Data Model designer, and click Unlink.
- 3 Redraw the link so that the old details table becomes the master table.
- 4 Define the summary as shown in “Defining a summary” on page 408.



- For more information on creating links in data models, see “Linking tables in a data model” on page 174 or “Understanding links and indexes” on page 176.

Example of creating an Avg summary on a single-table form

Suppose you want to know what average quantity your customers order per line item.

To create an Avg summary on the LINEITEM.DB table

- 1 Create a form based on the LINEITEM.DB table, click Form, New, Data Model.
- 2 Select LINEITEM.DB, click OK.
- 3 In the Define Layout dialog box, select the layout and fields you want to include in the form.
The form opens in the Design Window.
- 4 Click the field object tool in the Design Object toolbar, click an area of the form to place the object.
- 5 Right-click the field object, and click Define Field.
- 6 In the Define Field Object dialog box, choose Qty from the LINEITEM.DB list box.
- 7 Choose Avg from the Summary list box.
- 8 Click OK to return to the Design Window. Paradox changes the field object's label to Avg(Qty).
- 9 Click View, View Data to run the form.

Paradox calculates the average of all quantities ordered and displays the value in the summary-field object.

Example of creating a count summary in a report

Suppose you're working with a tabular report on the sample Customer table and want to know how many customers you have in each country.

Defining a count summary in a report

- 1 In the Report Design Window, create a group band on the Country field of Customers. See “Adding or defining a group band” on page 262.



- 2 Click the *Field tool* on the Toolbar, drag in the group band to place an undefined field object below the Country field.
- 3 Right-click the field object, and click Define Field.
- 4 Choose the Customer No field from the CUSTOMER.DB list box.
- 5 Choose Count from the Summary list box.
- 6 Click OK to return to the Design Window.
- 7 Click File, Print to print the report.

For each unique country value, Paradox shows the country name, the number of customers in that country, and a table frame that displays customer information.



- When you print or preview a report, Paradox performs the calculation defined by the summary and returns a value. In the example of the count-by-country summary, Paradox looks at the record band for each group and returns the number of records in that band.



- When you define a count, it is a good idea to count the values in a table's primary-key field. Because a primary-key field must contain data, you will be sure to get an accurate count.

Memo fields

When you create a memo or formatted memo field, you specify how much of the memo Paradox stores in the table. The entire memo is stored in a different file. For more information see “Creating a Paradox table” on page 53.

The time it takes Paradox to access the .MB file (Paradox stores memo data in a file with the name of the table and a .MB extension) and display its information in your form depends on a variety of factors, such as the size of the memo and the speed of your system. To increase performance, you can display only the data stored in the table.

Displaying memo field contents

You can choose to display only the first line of text in a memo field, or display the entire contents of the field.

To display the entire contents of a memo field

- 1 Open a form or report in the Design Window.
- 2 Right-click the memo field, click Properties.
- 3 Click the Run Time page.
- 4 Enable the Complete Display check box.

Protecting and hiding data in a field

In the run time version of your database, there are times when you want the user to be able to view a field, but not be able to change it. You can make a field read-only by using a password.

You can also suppress the contents of a field when you run a form. The field is visible, but not its value. This is especially useful for entering passwords or other protected information.

Protecting or hiding a field's contents

You can prevent a field's data from being changed when you run a form. To prevent someone from changing data in a field no matter how they access the field (from a table, any form, or a query), use a read-only auxiliary password. For more information see "Passwords" on page 73.

To make a field read-only

- 1 Open a form in the Design Window.
- 2 Right-click the field, click Properties.
- 3 Click the Run Time page.
- 4 Enable the Read Only check box.

To hide a field's contents

- 1 Follow steps 2 and 3 of the above procedure.
- 2 Enable the No Echo check box.

Paradox will not display data you enter in the field.



- For more information on the Echo check box, see No Echo property in the Object property reference online Help.
-

Calculated field objects

A calculated field in a form or report performs a calculation on the values of one or more fields. The calculation is an expression (which might have several components or terms) that must resolve to a single data value. If you only want to calculate a value based on the values in one field, you should use a summary field. See “Summary fields” on page 404 for more information.

Calculated fields are commonly used to determine values from two or more fields in a table. For example, you can create a field object in a form on the Lineitem table and define the field as a calculated field by using the formula

```
[LINEITEM.Qty] * [LINEITEM.Selling Price]
```

The value of a record in this calculated field is the product of the values of the Qty and Selling Price fields.

Why use a calculated field?

- Calculated fields are space savers in tables. In most cases, users want to see calculated results in reports and forms. Calculated fields perform calculations on existing data only at runtime (for example, when you view a report). This eliminates the need to store excess data in the table.
- Calculated fields offer a broad range of functionality. You can use calculated fields to perform many different operations besides mathematical calculations. You can use them to concatenate string values, call built-in and custom methods (those returning a single value), base operations on logical criteria, and perform special functions (such as Sum and Average). The combination of these and other attributes can be powerful additions to your application.

Storing values from calculated fields in a table

Values in calculated fields, whether in a form or report, are not stored in the table. Values are created strictly for viewing or printing purposes. If you want to store these values, perform the calculation in a query.

Calculated fields and summary fields

You can place calculated fields and summary fields on a form or report.

A calculated field performs a calculation on a set of records. Before you can perform an operation on the set, you must define the set by defining the scope of the calculation. The scope of a calculated field is the same as that of a summary field.

A summary is a type of field calculation. You can use summaries to sum, count, or average the values in a field. You can find the minimum, maximum, standard deviation, and variance of values in a field. See “Summary fields”

You create calculated fields and summary fields in the Define Field Object dialog box, which you can open by right-clicking the field and choosing Define Field.

Calculations on summary fields

In reports, you can perform calculations on the values generated by summaries.

For example, you can group the Orders table by Customer No and then create a summary field — Total Due — to sum the Balance Due field. This report would tell you the amount that each customer owes.

Suppose a new policy requires you to charge each customer \$5 if they have an outstanding balance. You can create the following formula:

```
[ORDERS.Balance Due]+5
```

As the report runs, Paradox adds all the values in the Balance Due field for each customer, then adds five to the total.

Summaries on calculated fields

Calculated field expressions can contain summary operators. For example, the sum of all invoice totals from the Orders table multiplied by a sales tax of 7.75% could be expressed as follows:

```
SUM([ORDERS.Total Invoice]) * .0775
```

You could also calculate the sum of all line item totals (in a given scope) and multiply that value by a sales tax of 7.75% using the following expression:

```
SUM([LINEITEM.Qty]*[LINEITEM.Selling Price])*0.0775
```

Creating calculated fields

Calculated fields can include

- arithmetic operators +, -, *, /, and ()
- logical operators AND, OR, and NOT
- comparison operators <, >, <>, =, >=, and <=
- summary fields (sometimes called aggregates). For example

```
SUM([table.fieldA] + [table.fieldB])
SUM([table.fieldA]) + SUM([table.fieldB])
```
- object references, such as the name of an object on the form. (Object names are always unique.)
- numeric constants
- alphanumeric strings

- any of the ObjectPAL mathematical, statistical, string manipulation, and date/time methods that return a single value
- custom ObjectPAL methods or procedures that are defined in forms or contained in libraries and accessed by forms. (Custom methods are not accessible by reports.)
- combinations of any of the above

Referring to fields and field objects

The field object in a form or report design is not the same as the actual field in the table that the field object represents and contains. This distinction is important to remember when you use field names in calculations. For example

- the expression Qty * Price performs a calculation on the field objects named Qty and Price
- the expression [LINEITEM.Qty] * [LINEITEM.Price] performs a calculation on the values in the actual Qty and Price fields in the Lineitem table

The field object in the design and the field in the table to which the form is bound are usually equivalent. At times, however

- a field object is not associated with a table (for example, it might be another calculated field)
- a field object might be unbound (not associated with a field in any table) and not defined as a calculated or special field
- a field from a table in the data model is not displayed in the design, but you must reference its field value

A field object might not have the same name as the field to which it is bound.

Creating a calculated field

To create a calculated field

- 1 Right-click the field object, and click Define Field.
- 2 Enable the Calculated check box.
- 3 Type the calculation you want in the Calculated box.

Example of calculating with a summary operator

You can use calculated fields in forms and reports to generate field values that you might otherwise store in the table itself. For example, tables are sometimes designed with quantity, selling price, and total invoice amount

fields. The total invoice is the price multiplied by the quantity. When you use calculated fields and summary operators, the total invoice field need not be part of the actual table. You can instead create a field in your form or report that calculates the total invoice value.

The following expression generates the total for each record in the Lineitem table:

```
[LINEITEM.Qty]*[LINEITEM.Selling Price]
```

This expression can be defined in a calculated field object in a table frame or multi-record object.

When you define a calculated field, you must type a value in the field's label. When you define the field as calculated, Paradox shows "formula" in the field object.

When you run the form (or print or preview the report), Paradox calculates the total for each record by multiplying the Selling Price value by the Qty value for each record in the table.

You can create a calculated field that calculates the total of all line items, rather than the total of individual records. To generate the total of all line items in a given scope, you could use the following expression:

```
SUM([LINEITEM.Qty]*[LINEITEM.Selling Price])
```



- The example above illustrates how you must use the sum() operator with a calculation. A reference to the UIObject name of a calculated field that contains the same calculation is not valid with the SUM() operator.
-

Using a field name in a calculation

When you create a calculated field on a form or report, the table name that field references is saved as part of the .FSL or .RSL file. If you open the form or report with a different table, the calculated fields may not be updated to reflect the change. Therefore, the calculation tries to reach information in a table (or tables) that is not bound to the document.

Punctuation marks, particularly periods, are reserved characters in Paradox. Paradox uses dot notation to reference objects within forms and reports, and uses periods (dots) in field names to invalidate this process. If you use the Copy Field button when you define a field, you can easily copy a punctuated field into the calculated field box. If the field name has periods in it, such as Total.Invoice, Paradox looks on the report or form for an object named Total containing another object called Invoice. Consequently, field names with punctuation can cause errors when you use them in a calculated field.

To use a field name in a calculation

- 1 Open a form or report in the Design Window.
- 2 Right-click the field, click Define Field.
- 3 Choose the field you want from the table's list box.

The field name appears in the box at the top of the Define Field dialog box.

- 4 Enable the Calculated check box.
- 5 Choose Copy Field to place that field in the Calculated box.

To reference another calculated field on the same form or report

- 1 Right-click the field objects and click Properties to determine their object names (displayed in the Name Of Object text box on the General page of the Properties dialog box).
- 2 Use these names in the calculation.

To update calculated fields when opening a form or report with a different table

- Redefine the calculated fields so they refer to the new tables, and save the form or report.

To use a field name that contains punctuation in a calculated field

- Enclose the field name in quotes.



- When Paradox places the field name in the box, it is selected. Move the cursor to deselect the field name before you begin typing. (If you accidentally type and replace the selected field name, press ALT + BACKSPACE to restore the name.)
 - In addition to the field name, the directory alias (if any) of the table and the table's name are visible. For example, if you choose the Balance Due field from the Orders table (and the Orders table is in your working directory), [WORK:ORDERS.Balance Due] appears in the Calculated text box. This points to the exact location of the field in the expression.
-



- If you have assigned a table alias to a table, use that alias instead of the table's name when you define calculated fields.
 - When an object is used in another calculated field or expression or in a report, you can rename the object so it is easily recognizable. To change the name, type in the desired name on the General page of the Field Properties dialog box.
-

Aligning a calculated field with data in a table frame

If you place a calculated field in a table frame column, for example, at the bottom of a column of numbers, you need to align the decimal points in the calculated field with the decimal points in the numbers in the column.

To align a calculated field with data in a column of a table frame in a report

- 1 Place the calculated field in the table frame.
- 2 Select the edit region on the calculated field.
- 3 Hold down SHIFT and click the field region of the table frame.
- 4 Click Format, Alignment, Align Right.
- 5 Right-click the edit region of the calculated field and click Properties.
- 6 Click the Run Time page, and disable the Fit Width check box.

Example of calculating with a field and a constant

Calculated fields can be used to perform calculations that include a field and a constant. For example, suppose you want to show what the selling price of line items would be if you raised all prices by 25%.

- 1 Create a form bound to the Lineitem table, click Form, New, Data Model.
- 2 Select Lineitem.db
- 3 Choose the tabular layout and the fields for your form.

The form opens into the Design Window.

- 4 Select the field object from the Design Object Toolbar, and place it on the form.
- 5 Change the field label to the following:

Selling Price increased by 25%:

(To change the field label, click three times on the field to place the cursor inside the text, then type the new label.)

- 6 Right-click the field object and click Define Field.
- 7 In the Define Field Object dialog box, enable the Calculated check box.
- 8 Type the following formula in the Calculated box:

```
[LINEITEM.Selling Price] * 1.25
```

When you run the form for each record in the table, the Selling Price field shows the current price, and the calculated field shows the price with the proposed increase.

Example of calculating with an alpha string

You can use the + operator to combine alpha strings.

For example, suppose you want to create a field called Address that combines the values of the Street, City, State/Prov., and Zip/Postal Code fields for the Customer table.

- 1 Create a form or report by using the Customer table in the data model. See “Creating data models” on page 171.
- 2 In the Design Layout dialog box, choose Blank style.
- 3 In the Design Window, use the *Table Frame tool* to place a table frame with three columns.
- 4 Select the first field in the table frame (click three times to get to the field), then right-click the frame and click Define Field.
- 5 In the Define Field Object dialog box, choose Customer No from the Customer list box.
- 6 Repeat step 4 with the second field in the table frame and choose Name.
- 7 Repeat step 4 with the third field in the table frame and click Define Field; in the Define Field Object dialog box, type the following calculation:



```
[CUSTOMER.Street] + " " + [CUSTOMER.City] + ", " +  
[CUSTOMER.State/Prov] + " " + [CUSTOMER.Zip/PostalCode]
```

The + sign appends one string to the end of another. (You must type within quotation marks the spaces and commas you want inserted between fields.)

- 8 Click OK.

In the Design Window, Paradox displays the word “formula” in the calculated field object.

- 9 Type the word Address as the calculated field's label.

When you run the form, Paradox combines the values from the four fields for each record of the table and inserts spaces and commas where you placed them in the calculated expression.

Number methods in calculated fields

Most of the number type methods, or procedures, also work in a calculated field. You can use number methods to do such things as round numbers in various ways, derive a fractional part of a number value, find the higher of two values, ensure integer answers from calculations, or find the differences between dates and times. For a complete listing of number methods, see Number methods in the online ObjectPAL Reference.

Paradox recognizes methods in calculated fields such as Round, LongInt, Fraction, and Max. Paradox also recognizes cos, sin, tan, acos, asin, and atan, which only deal with angles in radians.

Rounding a value

You can choose to round a value to a specific number of decimal places or to the nearest whole number.

To round a value to a specific number of decimal places

- 1 Open a form or report in the Design Window.
- 2 Right-click the field, click Define Field.
- 3 Enable the Calculated check box.
- 4 Type the following expression in the Calculated box:

```
round([fieldname], # of digits accuracy)
```

Example

```
round([ORDERS.Total Invoice], 1)
```

If the value in Total Invoice is \$555.94, \$555.90 is returned.

To round a value to the nearest whole number

- 1 Open a form or report in the Design Window.
- 2 Right-click the field and click Define Field.
- 3 Enable the Calculated check box in the Define Field Object dialog box.
- 4 Type the following expression in the Calculated box:

```
round([fieldname]), # of digits accuracy)
```

Example

```
round([Orders.Total Invoice],0)
```

If the value in Total Invoice is \$555.67, \$556.00 is returned. A value of \$555.45 returns \$555.00.

Altering the appearance of a value

You can set a field to display only a truncated whole number instead of a decimal, or you can set a field to display only the portion of a value that follows the decimal.

To format a decimal value as a whole number

- 1 Open a form or report in the Design Window.
- 2 Right-click the field, click Define Field.
- 3 Enable the Calculated check box.
4. Type the following expression in the Calculated box:

```
LongInt([fieldname])
```

Example

```
LongInt([ORDERS.Total Invoice])
```

A value of \$555.23 returns \$555, as does \$555.95.

To derive a fractional part of a numeric value

- 1 Open the Design Window of a form or report, right-click the field and click Define Field.
- 2 Enable the Calculated check box.
3. Type the following expression in the Calculated box:

```
fraction([fieldname])
```

Example

```
fraction([ORDERS.Total Invoice])
```

A value of \$555.23 returns 0.23.

Finding the higher or lower of two values

You can program a calculated field to return the maximum or minimum value of two fields.

To find the higher of two values

- 1 Open a form or report in the Design Window.
- 2 Right-click the field and click Define Field.
- 3 Enable the Calculated check box.
- 4 Type one of the following expressions in the Calculated box:

```
max(value1, value2)
```

```
min(value1, value2)
```

Example

```
max([ORDERS.Total Invoice], [ORDERS.Amount Paid])
```

Unless the amount has been paid in full, this will always return the value in Total Invoice.

Date and time calculations

Paradox allows you to perform calculations with dates just as you would perform calculations with any other numbers. You can use a calculated field to determine the difference between dates; this allows you to modify a large form or report so that it contains only specific information.

Finding the difference between two dates or times

You can find the difference between any two dates or times so long as they are represented in the same format.

To find the difference, in days, between two dates

- 1 Open a form or report in the Design Window, right-click the field and click Define Field.
- 2 Enable the Calculated check box.
- 3 Type one of the following expressions in the Calculated box:

```
number(date1-date2)
```

This assumes date1 and date2 are field objects of the same type.

For example, if date1 is 5/10/95 and date2 is 5/5/95, this example returns 5.00.

```
number(date(date1)-date(date2))
```

This example assumes date1 and date2 are strings that represent the appropriate date format. For example,

```
number (date ("5/10/95") - date ("5/5/95"))
```

This example also returns 5.00.

To find the difference between two times

- 1 Open a form or report in the Design Window, right-click the field and choose Define Field.
- 2 Enable the Calculated check box.
- 3 Type the following expression in the Calculated box:

```
format ("TO(%H Hours, %M Minutes)", time1-time2)
```

This example assumes that time1 and time2 are two fields that have time values in the appropriate format (HH:MM:SS am/pm).

For example, if time1 is 5:25:00 pm and time2 is 1:15:00 pm, this example returns an answer of 4 hours, 10 minutes.

Calculating a date based on the current date

You can establish a field that will calculate a date based on the current date. For example, in August you want to print a list of transactions that is current up to the last day of the prior month (July 31). In the report header, you want the title to read "Transactions as of 7/31/97."

To establish a field that will calculate a date based on the current date

- 1 Open a form or report in the Design Window, right-click the field and click Define Field.
- 2 Enable the Calculated check box.
- 3 Type the following expression in the Calculated box:

```
today() - day(today())
```

Today() is today's date, and day(today()) is the number of days since the beginning of the month. When you subtract the number of days since the beginning of the month from today's date, the last day of the prior month is returned.

Calculated fields and printing

Calculated fields increase your printing options. They allow you to control page numbering, capitalization and fields printed. You can also print the formula in a calculated field.

Controlling page numbering with a calculated field

You can start the numbering of the pages on a report at a value other than 1. For example, if you want the first page to have a page number value of 10, and the number to increase by one for each following page, perform the following steps.

To control page numbering with a calculated field

- 1 Open a report in the Design Window.
- 2 Place the field object in the page header or footer band.
- 3 Right-click the field, click Define Field.
- 4 Choose Page Number from the Special Field list.
- 5 Right-click the edit region, click Properties.
- 6 Click the Font page, set the font color to white (or whatever color the page background is) to make the field invisible.
- 7 Create a new field in the page header or footer band where you want the page number to appear.

This is the actual Page Number field that will be displayed.

- 8 Right-click the new field, click Define Field.
- 9 In the Define Field Object dialog box, enable the Calculated check box, and type the following expression in the Calculated box:

```
Page_number.value + 9
```

Page_number is the default object name given to the Page Number field you just created.
- 10 Change the label on the new calculated field to read “Page,” or whatever you would like.

Using a calculated field to print only fields containing data

You can vary what a field displays based on whether or not another field is blank.

To prevent blank fields from printing

- Create a calculated field, and type in the following formula:

```
iif(isBlank(fieldname), ValueIfTrue, ValueIfFalse)
```

If (fieldname) contains no value, ValueIfTrue is used. Otherwise, ValueIfFalse is used.



- For Number, ShortNumber, and Currency fields, isBlank always returns a FALSE value if Treat Blank Fields As Zero is enabled on the Database page of the Preferences dialog box (Edit menu).
-

Using a calculated field to capitalize fields when printing

You can capitalize certain fields and records from the database when you print a report.

To print the Name field as all capital letters



- 1 Using the sample Customer file as an example, place a Name field with the *Field tool*.
- 2 Right-click the field click Define Field.
- 3 Enable the Calculated check box and type in the following expression in the Calculated box:

```
Upper ([CUSTOMER.Name])  
  
format ("CC", [CUSTOMER.Name])
```

This calculation takes the Name field and converts each word to have an initial capital letter; for example, “sight diver” or “SIGHT DIVER” to “Sight Diver.”



- The Name field does not need to be in the report.
-



- If you want to convert all names to lowercase, replace “upper” in the above calculation with “lower.”
 - A calculation to return an initial capital letter on the name can be done like this:
-

Printing a calculation formula

When you define a field as a calculated field, the formula becomes an ObjectPAL source. This means that the formula prints with the other ObjectPAL methods that are connected to the document. You can print just the formulas for the calculated fields, or all the ObjectPAL code (for a form only).

To print only the formulas of calculated fields in a form

- 1 Open the Design Window of a form or report, click View, Document Source to create a temporary report that lists all the ObjectPAL code in that report. This report is based on a temporary table called PAL\$SRC.DB.
- 2 Click View, Design Report.
- 3 Click Format, Filter.
- 4 In the MethodName text box, type calcField, then click OK.
- 5 Click File, Print to print the temporary report.

To print all the formulas of calculated fields in a report

- 1 Click File, Open, Report.
- 2 Enable the Open As A Form check box.
- 3 Click the Edit The Form Design button.
- 4 Choose the appropriate report from the Look In list, and then click Open.
- 5 Click View, Design Form.
- 6 From the Form Design Window, click View, Document Source to create a temporary report that lists all the ObjectPAL code in that report. This report is based on a temporary table called PAL\$SRC.DB.
- 7 Click File, Print to print the temporary report.

Graphic objects

You can place graphic images in a form or report by putting a graphic object in the document, and then inserting the graphic inside the graphic object. You can paste a graphic from the Windows Clipboard, or paste the image from a .BMP, .PCX, .TIF, .GIF, .EPS, and .JPG file.

Using graphics

Although Paradox allows you to do some basic manipulation of graphics, it is best if you make major changes to your graphics in the server application. Paradox will allow you to size, move, copy, and crop a graphic that you place on a form or report.

See the Object property reference in the online Help for more information about graphics properties.

Placing a graphic on a form or report

Paradox uses frames to contain all graphics. To place a graphic on a form or report, first create the frame, and then insert the graphic.



To make a graphic frame

- 1 Click the *Graphic tool*.
- 2 Do one of the following:
 - to create a graphic frame at its default size — click the area of the form or report where you want to place the graphic.
 - to create a graphic frame of any size — click the area of the form or report where you want to place the graphic and drag to size the object.
- 3 If you release the mouse button and the frame is not the desired size or shape, click and drag any of the eight handles that surround the object.

The words Undefined Graphic appear in the graphic object.

To place a graphic in the frame

- Right-click one of the following:
 - In the Design Window, right-click the graphic frame and click Paste to place the contents of the Clipboard in the graphic frame. (If the Clipboard is empty, Paste is dimmed.)
 - In the Design Window, right-click the graphic frame and click Paste From to place a file in the graphic frame.

The Paste From Graphic File dialog box opens.



- When you define a graphic object, Paradox resizes it to fit the contents of its frame and checks its Size To Fit property. You must disable this property before you can resize the graphic object. For more information about the Size To Fit property, see the Object property reference in the online Help.

Moving a graphic

Click inside a graphic's frame to move the graphic within the container. To move the graphic as a whole, you must select both the graphic and the frame.

To move a graphic

- 1 In the Design Window, click outside the graphic object.
- 2 Click the frame of the graphic until the handles appear around the container.
- 3 Drag the object to a new place.
- 4 To move the graphic within the container, click the container a second time to activate the graphic. The handles disappear, but you still see shadows on the rulers and the pointer looks like a hand. Drag the graphic to a new location within the container.

To place a graphic on a button



- 1 Use the *Graphic tool* to place a graphic object on the button.
- 2 Right-click the button, click Properties.
- 3 Click the Design page.
- 4 Enable the Contain Objects check box.

Copying a graphic to a file without using Export

You can save a graphic to any file using the Copy to function.

To copy a graphic to a file without using Export

- 1 Click the graphic object.
- 2 Click Edit, Copy To.
- 3 In the Copy To Graphic File dialog box, type a file name, including the path if necessary, in the New File Name box.

Resizing a graphic or OLE object on a report

When you place a graphic or OLE (Object Linking and Embedding) object in the Report Design Window, the container you place automatically expands to fit the size of the contents. By default, Paradox enables the Size To Fit property. If a graphic is too big for its frame, you can move the graphic within its frame or crop the graphic to the size and area you want.

To resize a graphic or OLE object

- 1 Open the Design Window of a form or report, right-click the OLE object and click Properties.
- 2 On the Design page of the Properties dialog box, disable the Size To Fit check box.
- 3 Click OK to return to the Report Design Window.
- 4 Click the graphic to select it.
- 5 Drag the handles to resize the graphic.

To crop a graphic

- 1 Open the Design Window of a form or report, right-click the container and click Properties.
- 2 On the Design page of the Properties dialog box, disable the Size To Fit check box.
- 3 Click OK to return to the Design Window.
- 4 Drag one of the sizing handles of the container until it is smaller than the graphic it contains.
- 5 Click the graphic to select it. The pointer changes to an open hand.
- 6 Drag the graphic around in the container to the position you want within the frame.
- 7 Resize the container if necessary.



- For more information about the Size To Fit property, see the Object property reference in the online Help.
-

Understanding raster operations

When you define a graphic object, you identify a source graphic (a file) to be placed in a destination (your computer's screen). Most often, Paradox assumes you want an unchanged copy of the source placed on the screen.

Suppose, however, you want the source graphic and the screen to interact. You might want to make the source graphic transparent, to have the color of the page shows through, or you might want to invert the color of the source graphic.

Raster operations define how Paradox combines the source graphic with the destination — inverting, combining, including, or excluding colors to your specifications. Paradox uses the Boolean AND, OR, and XOR comparison operators to combine individual pixels of color during raster operations.

The following table briefly describes each raster operation:

Raster operation	Onscreen result
Source Copy	Copy an unchanged source graphic to the destination.
Source Paint	Combine the source graphic and the destination using the Boolean OR operator.
Source And	Combine the source graphic and the destination using the Boolean AND operator.
Source Invert	Combine the source graphic and the destination using the Boolean XOR operator.
Source Erase	Invert the destination and combine it with the source graphic using the Boolean AND operator.
Not Source Copy	Invert the source graphic and copy it to the destination.
Not Source Erase	Combine the source graphic and the destination using the Boolean OR operator.
Merge Paint	Invert the source graphic and combine it with the destination using the Boolean OR operator.

Demonstration of raster operations

To see the effects of these raster operations, open RASTEROPFSL in your SAMPLE folder (or wherever you installed the sample applications).

Creating a mask for a graphic

Suppose your form's page is colored, and you want to place a graphic object on the page. If the background of the graphic object doesn't match the color of the page, the borders of the graphic will show. Use a mask to make some

areas of the graphic transparent. Masks allow the page's color to show through it.

For example, suppose your form's page is yellow and that you want to place an oval-shaped graphic object on the page. Unless the background of the oval graphic and the yellow of the page match exactly, the borders of the graphic object will be visible.

To create the mask

- 1 Make a copy of the source graphic. Call it MASK.BMP.
- 2 In a graphics application, such as Corel PHOTO-PAINT™, modify MASK.BMP to make the parts you want to be transparent black and all other parts white.
- 3 In the Form Design Window, place a graphic object, then right-click the graphic object and click Paste From.
- 4 Choose MASK.BMP from the File Name list to insert this graphic into the graphic frame.
- 5 Right-click the graphic object and click Properties. Choose Source Paint from the Raster Operation box on the Raster Operation page.
- 6 Place another graphic object. Right-click the object and click Paste From. In the Paste From Graphic File dialog box, select your original graphic.
- 7 Right-click the original graphic object. In the Properties dialog box, choose the Source And Raster operation from the Raster Operation box on the Raster Operation page.
- 8 Select both graphic objects by clicking each object while you hold down SHIFT.
- 9 Right-click one of the objects and click Properties. In the Frame page, select the top left style in the Frame Style palette to remove the frames from the graphic objects.
- 10 With both graphic objects still selected, click Format, Alignment, Align Left. Then click Format, Align, Align Top. Finally, click Format, Group.

When the original graphic and the mask are combined, the areas you want transparent allow the page color to show through.



- The order you place the graphics on the form determines the results, because it affects which bitmap is in front. If you place the original graphic on the form before the mask, you must select the original and click Format, Order, Bring To Front before you align the graphics.
-

To choose which raster operation you want to use

The choices for raster operations are located in the properties dialog box.

To choose a raster operation

- 1 Select the graphic you wish to change.
- 2 Right-click the graphic, select Properties.
- 3 Click the Raster Operation page.
- 4 Choose the raster operation you want to use from the Raster Operation list.



- See “Raster Operation properties” in the online Help for more information on specific raster operations.
-

Multi-record objects

A multi-record object displays several records at a time by using a field layout that repeats a specified number of times horizontally and vertically on the page. You can place fields in any pattern. You define the field layout for one record and then specify how many records across and down you want.



- The record object inside the multi-record object is a container for the records. If you make the record object too small, Paradox will eliminate fields in the Define Multi-record Object dialog box (right-click menu) to make the record fit the container. To resize the records, select the master record region and drag any of its selection handles.
-

Placing a multi-record object on a form or report

After you place a multi-record object, you can specify which fields display in each record. Only the fields from a detail table can be displayed in a multi-record object.

To place a multi-record object on a form or report



- 1 In the Design Window, Click the *Multi-record tool*.
- 2 Click to place the multi-record object at its default size, or click and drag to place the multi-record object and specify its size.

- 3 Click the record object inside the multi-record object.
- 4 Resize the record object to make it large enough to contain all the fields you want to include in the record.

To define a multi-record object

- 1 In the Design Window, right-click the multi-record object and click Define Record.
- 2 In the Define Multi-record Object dialog box, which displays the tables bound to the document, choose the fields you want from the table list box (for example CUSTOMER.DB).



- If you make the record object too small, Paradox will eliminate fields in the Define Multi-record Object dialog box to make the record fit the container.
-

Specifying the record and field layout of a multi-record object

You can specify how many records to repeat across and down in a multi-record object. You can also specify whether you want fields to be displayed in columns or rows.

To specify the record layout of a multi-record object

- 1 In the Design Window, right-click the multi-record object and click Properties.
- 2 Click the Record Layout page to bring it to the front.
- 3 Specify the layout by:
 - Typing the number of records to repeat across and down the page in the Number boxes.
 - Setting the vertical and horizontal separation between the records by typing the appropriate numbers in the Separation boxes; Paradox uses the unit of measurement (inches or centimeters) you specify in the Grid Settings.
 - Establishing the order in which the records appear by enabling the appropriate Fill Order button.

To specify the field layout of a multi-record object

- 1 In the Design Window, right-click the multi-record object and click Define Record.

- 2 In the Define Multi-record Object dialog box, choose the field you want to display in the object from the table's list box.
- 3 Click OK to return to the form or report.
- 4 Right-click the multi-record object and click Field Layout.
- 5 In the Layout Multi-record Object dialog box, enable one or more of the following:
 - By Column button — displays fields by columns within the record
 - By Row button — displays fields by rows within the record
 - Label Fields check box — displays field labels within the record

On the Fields page, select fields to be included in the record and use the arrow buttons to set the order of the fields.



- When you specify the layout of a multi-record object in a report, the number of times records repeat can be affected by the Show All Records and Delete When Empty properties on the Run Time page of the Properties dialog box.

Resizing records in a multi-record object

You can expand or contract individual records in a multi-record object when you print or preview reports. This means that the multi-record object does not display the records in a fixed-size grid. If you use the Variable Height (Columnar) property, you can usually fit more records on a single page than you can without the Variable Height (Columnar) property.

To resize records in a multi-record object

- 1 Select the master record region of a multi-record object.
- 2 Drag any of its selection handles.

Paradox resizes the gray repeating regions along with the master record region.

To expand or contract records in a multi-record object

- 1 In the Design Window of a form or report, right-click the multi-record object and click Properties.
- 2 On the Record Layout page of the Properties dialog box, enable the Top-Down Then Left-Right button.

- 3 If you are creating a report, enable the Variable Height (Columnar) check box.

Columnar is not available unless you first select the Top-Down, Then Left-Right setting. The Columnar property is available only in reports.



- The record object inside the multi-record object is a container for the records. If you make the record object too small, Paradox will eliminate fields in the Define Multi-record Object dialog box to make the record fit the container.
- The record object inside the multi-record object is a container for the records. If you make the record object too small, Paradox will eliminate fields in the Define Multi-record Object dialog box to make the record fit the container.

Showing all records and columns in multi-record objects

When you run a form or report, Paradox can expand a multi-record object to create as many pages as necessary to display all records or columns.

To show all records and columns

- 1 In a Design Window, right-click a multi-record object, click Properties.
- 2 Click the Run Time page.
- 3 Enable the Show All Records check box. For table objects, you can also enable the Show All Columns check box.



- If Show All Records is disabled, Paradox displays a fixed number of records.

Notebook objects

Notebooks contain one or more pages. Each page has a tab that you can click to display the page. You can use a notebook to replace multiple form pages. For example, you can place the information from each table in the form's data model on a different notebook page, rather than on multiple form pages. This makes viewing and editing data much more efficient because the you can click a tab to display the page, rather than navigating through multiple pages of the form.

Notebooks are available only in forms, not in reports.

Working with notebook objects

Each notebook page is a container for other objects. Any design object that can be placed on a form can be placed on a notebook page. You can even place a notebook object on a notebook page.

.....
An example of a notebook object with button objects. Adding button objects to the notebook makes retrieving information more efficient.
.....



Data objects on notebook pages

You can place data objects on different notebook pages to make data maintenance more efficient.

For example, by using a data model that contains a one-to-many relationship, you might put the master-table records on the first notebook page, the first detail-table records on the second page, and the final detail-table records on the third page. You could then select the first notebook page, cycle through the master records, and consult the details only when needed. Not only does this simplify the display, but it improves performance.

Notebook properties

You can change the properties for the notebook as a whole, or for individual pages. For example, you can place the tabs on the top or bottom of the notebook and change the shape of the tab from square to angled. Individual pages can be colored, and each page can have a different color when it is active than when it is inactive. You can make the entire notebook, or individual pages, invisible at runtime.



- Two table frames on different notebook pages cannot refer to the same table in the data model.

Placing a notebook on a form

You use the Notebook tool to create notebooks on forms. A notebook cannot be placed on a report.

To place a notebook on a form

- 1 With a form open in the Design Window, click the Notebook tool on the Form Design Toolbar.
- 2 Click the form to place a notebook at its default size, or click and drag to place the notebook and specify its size.

Selecting a notebook or a notebook page

Notebooks conform to the conventions of the Select From Inside property. When that property is unchecked, the first click in the Design Window selects the outermost object. Subsequent clicks select the next smallest level of containership.

To select the entire notebook

- Click the notebook. (If you have already clicked once or twice on the notebook, clear the selection by clicking on the form page outside the notebook object.)

A double dotted line with sizing handles frames the notebook object. If you have difficulty selecting the entire notebook, make sure the Select From Inside check box on the Designer page of the Preferences dialog box (Edit menu) is disabled.

To select a notebook page

- 1 Click the notebook.
- 2 Click a page's page to select the page.
- 3 To select a different page, click the page's page.

Navigating notebook pages

You can move throughout the notebook you have placed on your form in a variety of ways.

Using the mouse or keyboard

- Display a notebook page by clicking its tab. (In a Design Window or when running the form).
- Cycle through the objects by pressing TAB and SHIFT + TAB. Use this technique to move to any notebook page, or to any object on any notebook page (Design Window only).
- Move through the notebook pages by pressing SHIFT + F3 (backward) and SHIFT + F4 (forward). (In a Design Window or when running the form.)

Using the right-click menu

You can right-click the notebook to move through its pages. This is similar to moving through the pages of a form.

- 1 Select the entire notebook.
- 2 Right-click the notebook,
 - Click Page, Next to move to the page to the right of the current page. If the current page is on the right edge of the notebook, Paradox chooses the left-most page on the row above the current page.
 - Click Page, Previous to move to the page to the left of the current page. If the current page is on the left edge of the notebook, Paradox chooses the right-most page on the row above the current page.
 - Click Page, First to make the first page (the one created first) current. In notebooks with multiple rows that have been shifted around, this indicates which page is first.
 - Click Page, Last to make the last page you created current.

Placing an object on a notebook page

You can place any design object on a notebook page. You can even place a notebook object on a notebook page.

To place an object on a notebook page

- 1 Select a notebook page.
- 2 Click an object's tool on the Form Design Toolbar.
- 3 Drag within the confines of the notebook page to create the object.



- To modify the label on the tab, select the label text object, press F2, and start typing. The label grows to fit the text.
-

Adding and removing notebook pages

The default number of pages for a notebook is two. There are times when you will want to have more than two pages in your notebook, so Paradox allows you to customize your notebook so that it has as many pages as you need.

Adding or deleting a notebook page

By default, a notebook has two pages. A notebook must have at least one page.

To add a page

- 1 Select the entire notebook.
- 2 Right-click the notebook and choose Properties.
- 3 On the General page, change the Number of pages to one more than the current number.

Paradox adds one page to the form at the end of the existing pages.

To add multiple pages

- 1 Select the entire notebook.
- 2 Right-click the notebook, click Properties.
- 3 On the General page of the Properties dialog box, type a number in the Number Of Pages dialog box.

To delete a notebook page

- 1 Select a notebook page.
- 2 Click Edit, Delete.



- You can control the number of tabs displayed and the number of rows that display them. For example, if you specify eight pages with four tabs across, the notebook will have two rows with four tabs on each row.
 - When you add rows, the tabs on any given row continue to remain on a common row. If you select a tab from the back row, the entire back row of tabs moves to the front row with the selected page.
 - To display the tabs in one scrolling row, add a scroll bar as described in “Placing a scroll bar on a notebook” on page 440.
-

Rotating notebook pages

You can move a selected notebook page to the last page’s position. You can also cut any page of the notebook and paste it to any other location.

To rotate notebook pages

- 1 Open the appropriate form in the Design Window, select the page you want moved to the end of the notebook.
- 2 Click off of the notebook then right-click the notebook and click Rotate pages.

To copy and paste a notebook page

- 1 Select a notebook page.
- 2 Right-click the page and click Cut or Copy to place the page on the Clipboard.
- 3 Select another notebook page.
- 4 Right-click that page and click Paste.

Paradox inserts the Clipboard’s notebook page after the active notebook page.



- You can also use the Cut, Copy, and Paste commands from the Edit menu.
-

Changing the appearance of a notebook

Although notebooks are somewhat fixed in appearance, you can change the size of the notebook and its tabs so as to fit the contained objects better. You can also place a scroll bar on the notebook, allowing you to work with small pages while still presenting all the fields you require.

Moving or resizing a notebook

Notebook pages cannot be moved or resized separately from the notebook, but you can change the height of the tabs on the top or bottom of the notebook.

To move a notebook

- 1 Select the entire notebook.
- 2 Drag it to a new location.

To resize a notebook

- 1 Select the entire notebook.
- 2 Drag one of the sizing handles to change the shape of the notebook.

To change the tab height on a notebook

- 1 Select the entire notebook so that a double dotted line with sizing handles frames the notebook object.
- 2 Drag one or more of the following:
 - The center sizing handle nearest the tabs to change the height.
 - The top center handle to resize the tabs on the top.
 - The bottom center handle to resize the tabs on the bottom.



- If you reduce the height of the tabs, you may want to choose a smaller font size for the labels.
-

Placing a scroll bar on a notebook

When the tabs do not fit in the available space, you either use multiple rows as discussed in “Adding or deleting a notebook page” on page 438 or you can use one row and add a scroll bar so that you can display the tabs in one scrolling row.

To add a scroll bar

- 1 Select the entire notebook.
- 2 Right-click the notebook, click Properties.

- 3 On the General page of the Properties dialog box, enable the Scrolling Tabs check box.

When the Scrolling Tabs check box is enabled, the notebook has one row of tabs. Those that do not fit are not visible. On the right side of the notebook are left and right arrow buttons. Click a button to scroll the tabs left or right. Hold down a button to scroll the tabs repeatedly.



- Scrolling does not change which page is active. You can scroll the tab for the active page off screen and still view the active page. When you scroll to the desired tab, you must click the tab to make its page active.
-

ActiveX and Native Windows Controls

ActiveX controls and native Window controls are useful tools in enhancing custom forms. They provide added functionality, such as adding a list box to help display items without taking up space or an ActiveX VCR control which allows you to scroll through records.

ActiveX Controls (OLE Control)

You can embed ActiveX (OLE control) controls into Paradox forms. ActiveX controls can be a complex miniature application such as a spreadsheet, Internet Web browser, communications package, or grid and graphing controls.

To interact with ActiveX controls at runtime, you can write ObjectPAL code to get and set properties, invoke methods, and handle events. To interact with an ActiveX control, you can refer to the UIObject name that hosts the ActiveX control directly or you can use the OleAuto ObjectPAL type. The OleAuto type lets you communicate with an OLE server and ActiveX control, and Native Window Controls, by translating ObjectPAL into OLE automation calls.

Each ActiveX control surface methods, properties, and/or events, which you can set and call when you design or run the form. Because ActiveX controls are a separate application running as a subprocess of Paradox, you will find the behavior different from normal Paradox UIObjects. Each ActiveX control has its own child window on the form and its own message queue. This gives the ActiveX control its own event model, which is sometimes called the “fire event” model.

ActiveX controls are said to “fire” events; they are either notifications that something is about to happen (before event), is happening (do event), has just occurred (after event), or requests to determine if an impending action is permissible (request event).

An ActiveX control application will often fire an event without asking first if it is acceptable to fire such an event. This is the way that the ActiveX control specification is written. You cannot use ObjectPAL to intercept events that are going to an ActiveX control application (for example, trying to disable a `mouseClick` on an ActiveX control). Because of this, ObjectPAL developers will find that the ActiveX control model requires some adjustment.

Native Window Controls

Paradox surfaces five controls we call native window controls (NCW). These are created using property, method, and event specifications from OLE embedding. You can link them as a hybrid between traditional Paradox controls (since these native Windows controls are built directly into Paradox itself) and regular ActiveX controls (because they follow the specifications in many areas).

The Application Program Interface (API) for a Native Windows Control is directly ported from the Windows API. These controls are wrapped in an ActiveX container in Paradox; therefore, they behave just like an ActiveX control. The ActiveX wrapper governs its size, position, and frame style, and it provides its hooks to ObjectPAL. NWCs use the same technique as regular ActiveX controls (OleAuto type) to set and get properties and to invoke methods. The NWC properties, methods, and events are visible in the Object Explorer, but cannot be set there. Their properties must be manipulated via ObjectPAL or interactively using the Object Explorer. Native Windows controls do not need to be installed, registered, or added to the toolbar. They come pre installed with Paradox.

For all practical purposes, a native Windows control looks like an ActiveX control to the Paradox form and language system. The same programming concepts that apply to ActiveX controls apply to native Windows controls. The only difference is that NWCs do not use OLE embedding or support any kind of user interface negotiation.

ActiveX control toolbar

Both ActiveX and native Window controls are found in the ActiveX control toolbar.



List Box—a native Window control that allows single or multiple selections.



Combo Box—a native Window control with an edit region and a list box.



Spin Box—a native Window control with Up and Down buttons to increase or decrease the value.



Progress Bar—a native Window control used to track the completeness of a process.



Trackbar — a native Window control that allows you to drag a pointer along a track to set numerical values.



Paradox® VCR Control — an ActiveX control used to move through records in forms.

Using ActiveXs and NWCs in Design mode

ActiveX controls are available from third-party vendors, and these vendors provide property pages for you to set properties during form design. This allows you to set the initial state of the ActiveX applications.

Before you can use a control, you must first register the control, then add the control to the ActiveX Control toolbar.

You can use ActiveX controls and Native Windows Controls the same way in forms. You place the control on the form, right-click the control to change its properties, and add new methods or events by using the Object Explorer.

For information on using and modifying your specific ActiveX control, see the documentation from the ActiveX control manufacturer.

ActiveXs in multi-record objects, table frames, and crosstabs

ActiveX Controls and Native Windows Controls do not clone in record objects or crosstab cells. This means that these controls will not embed in either object. If you create or move an ActiveX control inside a multi-record object or a tableframe, it will not be a child of the interior (repeating) record object. The same is true for crosstabs — the ActiveX control cannot be a child of a (repeating) cell object. ActiveX controls will not repetitively clone into multiple repeating record groups.



- For more information on ActiveX and Native Window Controls, see the ObjectPAL reference section in the online Help.

ActiveX control event types

ActiveX controls have events that are different from Paradox events. Each control comes with a primary event set that follows a basic convention for what types of events are fired and how the event parameters are packaged. If the default event type for the control can be canceled, you can modify the event parameters to make the control behave the way you want.

ActiveX controls can issue events, such as click events. The names of the events issued by a control are chosen by the creator of the control. You can see the names of the events in the tabbed pane of the Object Explorer on the Events page. All methods, events, and properties that come with a control are displayed in red text in the Object Explorer and are preceded by a round button. These methods, events, and properties will also be listed in the documentation for the control.

Controls usually follow a naming convention for their events. For example, Do events begin with the word Do, and Request events begin with the word Request. Because After events are the most common, any event that does not begin with one of the other type names is assumed to be an After event.

ActiveX control events fall into four basic categories: Request events, Before events, After events, and Do events. Of the four types of controls, Before and After events cannot be canceled.

Request events

A control fires a Request event to determine if an impending action is permissible and allows the user to cancel an action. Request events can be canceled.

Before events

Before events are notifications that something is about to happen. They are fired before an action occurs to allow the completion of actions that are needed before the event fires. Before events cannot be canceled.

Do events

Do events are notifications that something is happening. They are fired to allow the user to replace or supplement the control's default behavior. Do events can be canceled. Do events usually begin with the word Do, and the last parameter is the cancel flag.

After events

After events are notifications that something has just occurred. They are fired after an action occurs to allow response to the action. After events cannot be canceled.

Most real controls only do the After event. For example, a typical control issues only one event for a click. The event would be called Click, comes after the click has happened, and cannot be canceled.

Some controls will issue a series of related events. For example, for the Click event, you could see the following events:

- RequestClick (Request event)
- BeforeClick (Before event)
- DoClick (Do event)
- Click (After event)

Any particular control might not follow these guidelines. For example, it might only expose the DoClick or the Click event.

For information about using and modifying your ActiveX controls, see the documentation from the ActiveX control manufacturer.

Ambient properties

Ambient properties are properties a control adopts from its container. For example, an ActiveX control placed on a yellow form obtains information about the form's properties, determines that it can use the yellow background color, and incorporates the form's background color into its properties, along with any other properties it can use, such as foreground color and text font.

Ambient properties can be set for each control, but ActiveX controls are not required to use these properties. Therefore, not all controls will respond to changes in these ambient properties.

Ambient properties give information about the state of the container around the control. This can be the entire container (such as the background color) or the immediate area surrounding the control. For example, a control can be inserted into a text document that will have different sized fonts. The ambient font property of the control has different values, depending on where the control is placed.

Displaying the ActiveX Control toolbar

ActiveX and Native Windows Controls are both found in ActiveX Control toolbar in the Form Design Window.

To display the ActiveX Control toolbar

Do one of the following:

- Click View, Toolbars and enable the ActiveX Control check box.
- Right-click the background in the toolbar area, and enable the Add ActiveX Control option.

Placing a control on a form

You can easily place any of the controls from the ActiveX Control toolbar on your form, just as you would any other design object.

To place a control on a form

- 1 Click View, Toolbars and select the ActiveX Control toolbar.
- 2 Click one of the tools on the ActiveX Control toolbar.
- 3 Click in the Form Design Window to place the control at its default size, or click and drag to place the control and specify its size.
- 4 Right-click the object to add a method or event to the object by choosing the Object Explorer or to change its properties by choosing Properties.

Programming the Paradox VCR Control

The Paradox VCR control is an additional ActiveX control supplied by Paradox. You can attach it to your forms and use it as a tool for navigation. You must add ObjectPAL code to each button to define its action.

To program the Paradox VCR control

- 1 In a Form Design Window, click the Paradox VCR control on the ActiveX toolbar.
- 2 On a Form, click and drag to position the Paradox VCR control.
- 3 Select the Paradox VCR control and click Tools, Object Explorer.
- 4 On the Events tab, double-click any of the following events and add custom code:
 - Back
 - FastBack
 - FastForward
 - FirstRecord
 - Forward
 - Last Record



- For more information on defining the custom code for each button see Paradox VCR control in the online Help.
-

Registering an ActiveX control

You need to add the ActiveX control to the Toolbar before you can use it in a form.

To register an ActiveX control

- 1 Install the control on your computer according to the directions from the ActiveX manufacturer.
- 2 Start Paradox.
- 3 Click Tools, Register ActiveX Control.
- 4 In the Register ActiveX Control dialog box, locate and then double-click the appropriate file.

This registers the control and registers Paradox as an ActiveX automation server.

To add a control to the ActiveX Control toolbar from the Form Design Window

- Right-click an icon on the ActiveX Control toolbar, click Add ActiveX Control, and then select the appropriate tool.

To remove a control from the Toolbar

- 1 Open the Design Window of a form or report.
- 2 Right-click an icon on the ActiveX Control toolbar, click Remove ActiveX Control.
- 3 Select the tool you want to remove, click Remove.

Editing events on an ActiveX control

You can edit the manner in which Paradox responds to an event controlled by an ActiveX control by editing the event's code in the Object Explorer.

To edit events on an ActiveX control

- 1 Place an ActiveX control on a form.
- 2 Right-click the object, choose Object Explorer. (Make sure the tabbed pane is displayed with View, Tabbed Pane on the Object Explorer menu.)
- 3 Double-click the event on the Events page.
- 4 In the Editor window that opens, edit the method.

Table frame objects

If your form or report design includes a table, a table frame that represents the table will be visible. A table frame looks like its source table, but a table frame is not a table. It is a composite object that consists of:

- columns that represent fields
- rows (the top row represents all records)
- text objects that contain labels for the fields
- field objects that represent data from the source table in the first row below the header

Paradox automatically places a table frame on the design if you either choose a tabular layout in the Design Layout dialog box or create a multi-table form or report composed of a one-to-many relationship.

Working with Table frame objects

When creating a blank form or report, you can create a table frame and add only the fields you want to display. You must have at least one table in your data model in order to define the columns of your table. By setting the properties of your report, you can choose how many columns and rows you want displayed in Run mode.

Placing a table frame on a form or report

You might want to place a table frame on a design to display additional tables in a form or report.

To place a table frame on a form or report



- 1 With the appropriate form or report open in the Design Window, click the *Table Frame tool*.
- 2 Click the form or report to place the table frame at its default size, or click and drag to place the table frame and specify its size.

Paradox creates a table grid with labels and undefined fields. This is the table frame.



- If you specified a table in the document's data model, the new table frame can either be linked to or independent of that table.

Defining a table frame

When you define a table frame, you specify the table to use and which fields to include. Use the Table Frame tool to place linked or unlinked tables in a form or report.

Paradox creates an undefined table frame with a header that contains column labels that say “Label” and a record that contains undefined fields.

To define a table frame

- 1 Right-click the table frame and click Define Table.
- 2 In the Define Table Object dialog box, click the table you want from the data model.
- 3 Choose the fields you want to display from the appropriate table’s list box (for example, CUSTOMER.DB).

The fields and labels in the table are replaced by fields and labels that are appropriate to the chosen definition. Any contained objects, properties, or ObjectPAL code are lost.



- If the Size To Fit property is enabled on the Design page of the Properties dialog box, the table frame tries to size to the width required to show all columns. If it cannot, or if Size To Fit is not enabled, the missing columns are still there. You can view them by placing a horizontal scroll bar on the table frame.



- You can also define a table frame by either right-clicking the master record and clicking Define Record or defining individual field objects.
- If you want to delete or insert a column, simply right-click either on the column you want deleted, or the column to the right of where you want to insert the new column, and select Delete or Insert column.

Showing all records and columns in table frames

When you run a report, Paradox can expand a table frame object to create as many pages as necessary to display all records or columns.

To show all records and columns

- 1 Open the Design Window of a form or report, right-click a table frame object and click Properties.

- 2 Click the Run Time page.
- 3 Enable Show All Records In One Object and the Show All Columns check boxes.



- If Show All Records By duplicating object is enabled, Paradox displays a fixed number of records.
-

Modifying table frames

You can customize the properties of a table frame in a form or a report in the following ways:

- Right-click the field objects and click Properties to change properties.
- Right-click a record (row) as a whole and click Properties to change its properties.
- Right-click the table frame and click Properties to change any of its properties.
- Right-click the header and click Properties to change its properties.

Because the table frame you place in a design is not the actual table, property changes and table frame restructuring do not affect the actual table. Only changes made to the data appear in the table itself.

Changing the position and appearance of fields

You can move a field in a table frame object without removing the column to which the field belongs.

To move a field

- Click and drag it to a new position or move a field out of the table area by dragging it out.

Changing the appearance of columns and rows in a table

You can change the size, position, name and existence of any column or row in the table frame.

To change the appearance of rows in a table

- Drag the horizontal grid line under any field object.

This resizes the row height for all the rows in the table frame.

To change the appearance of columns in a table

- Resize a column by selecting the table frame and dragging the right grid line of the column.
- To resize all columns to the minimum width, right-click the table frame object and choose Minimize Columns.

To remove a column in a table

- Remove a column by selecting it and pressing DELETE.

You can also delete a column by resizing it to nothing. Drag the vertical grid line at the right of the column to the left. When you reach the minimum column width, the grid line changes to a dotted outline. Release the mouse button to delete the column.

To add a column in a table

- Add a column by selecting a column and pressing INSERT. The new column appears to the left of the selected column.

To move a column

- Move a column by selecting the header for the column and dragging it to a new position.

You can also select the whole column and drag it to the new location.

To change a column's name

- Select a column name (Paradox displays an insertion point) then type your change.

Changing header appearance and position

When a group breaks across several pages, you can repeat the group header at the top of each page. The Repeat Header property is not available for a table frame that has detached headers.

To resize header areas

- Drag the grid lines under the field labels.

The header labels must remain in alignment with the columns of the table; therefore, dragging either the header or the body of the table sideways causes both the header and the body of the table to move.

To repeat a table header in a report

- 1 Select the appropriate table frame.
- 2 Right-click the table frame and choose Properties.
- 3 On the General Page of the Properties dialog box, enable the Repeat Header check box.

To detach a header

- 1 Select the appropriate table frame.
- 2 Right-click the frame and choose Properties.
- 3 On the General Page of the Properties dialog box, disable the Attached Header check box.

You can now move the header to another location. In a report, you can move the header to another band.

Specifying grid style for a table frame

You can change the grid's style and color and also display a record divider between each row of data. When you enable the Record Divider check box, Paradox does not change the table frame image in the Design Window — that image already has visible record dividers. The difference will appear when you run the form or print the report. Without record dividers, horizontal lines do not appear between the records in the table frame.

To specify grid style for a table frame

- 1 Right-click the table frame and click Properties.
- 2 Click the Grid page
- 3 Set grid properties as appropriate.

Adding data and design objects to a table frame

You can add a regular, special, summary, or calculated field by placing and defining a new field object. These changes do not restructure the table itself. They change only the view of the table in this table frame on this document.

To change the definition of a field object

- Right-click the field, and click Define Field.

To add design objects and data elements such as other tables, charts, or crosstabs to a table

- 1 Select the container for the object you want to add.
- 2 Select the design tool for the object you want to add.
- 3 Draw the object so that it is contained within the boundaries of the container.

If you draw the object so that it extends beyond the boundaries of the container, it will only appear once on the form or report, rather than in every row of the selected column.

Combining (stacking) fields in a column

You can place the data from two columns into one column by stacking the columns. You do this by moving field objects from one column into another column, just as you would move any other design object. You can also add new field objects to an existing column.

To stack field objects in the same column

- 1 Resize the record area of the column to adjust its width and height.
- 2 Do one of the following:
 - Drag existing field objects from other columns into the desired column.
 - Create new field objects within the column.



- When you stack fields in a column, the document may be more readable if you right-click the table, choose Properties, and enable the Record Divider check box on the Grid page.
-

Text objects

Text objects in forms and reports fill a variety of needs. Use them to add labels, provide instructions, or create titles. You can change the formatting, alignment, color, font, and wrapping of text objects. Text objects can be placed separately on a form using the Text tool; or, they can appear automatically as part of another design object, for example as a label in a field or as a heading in a table frame.

Placing a text object on a form or report

You create a text object and type text inside the object's frame. Text objects in forms and reports grow and shrink to fit text differently, depending on how you create them.

To define the frame size before typing



- 1 Open a form or report in the Design Window, click the *Text tool*.
- 2 Click one of the following:
 - The form or report where you want to place the text object at its default size.
 - To create a text object of any size, click the form or report where you want to place the text object and drag to size the object.
- 3 Type the text.

As you type, Paradox automatically wraps the text at the right border of the frame. When you reach the bottom of the frame, Paradox scrolls the text upward so you can view the text you are typing.

To start typing without defining the frame size

- 1 Open a form or report in the Design Window, click the *Text tool*.
- 2 Click the form or report and begin typing without dragging to create a frame.

Paradox creates a single-row text object that expands to the right until you press ENTER. The insertion point then moves to a new line. As you continue typing, the text wraps automatically at the right border (which you defined by pressing ENTER) and continues to expand downward until you finish typing and click somewhere else. If you delete text, the text object shrinks in height to leave no empty space.



- The type of text object where the Fixed Size button is enabled on the General page of the Properties dialog box does not grow or shrink based on the amount of text you type. You can manually resize by dragging the frame.

- The type of text object where the Fit Text button is enabled on the General page of the Properties dialog box grows or shrinks to fit the amount of text you type. The Word Wrap property for this type of text object turns on automatically when you press ENTER. For more information on properties, see the Object property reference in the online Help.
 - When Word Wrap is enabled on the Text page of the Properties dialog box, you can only resize the object horizontally. When Word Wrap is disabled, you cannot resize the text object.
-

Using word wrap

You can specify Word Wrap for field and text objects in a form or report design. This feature wraps text automatically at the object's right border. Word wrap works differently for fields and text.

Fields

Word Wrap displays the contents of a field in more than one line when they exceed the width of the field object. Word Wrap is not available for graphic and Object Linking and Embedding (OLE) fields.

Text

Word Wrap creates a new line of text at the frame of the text object. If Word Wrap is disabled, only one line of text can be displayed in the text object. Pressing ENTER does not create a new line.

To enable word wrap

- 1 Right-click the field or text object in a Form Design or Report Design Window and click Properties.
- 2 Click the Text page of the Text Properties dialog box.
- 3 Enable the Word Wrap check box.

Changing text in a text object

You can only enter and edit text in text objects in the Design Window. When you run a form or preview a report, you can see text objects, but you cannot edit them.

To change text in a text object

- 1 Click the text object.

- 2 Click the text object again to place the insertion point in the text object.
- 3 Type the text.
- 4 After editing the text, do one of the following:
 - Press ESC or TAB.
 - Click outside the text object.
 - Click another tool from the Toolbar, or click the Selection Arrow.

If the Fit Text property for this object is enabled (on the General Page of the Properties dialog box) and the object contains no text, Paradox deletes the text object from your form or report.

To edit text using the keyboard

- 1 Press TAB to select the text object.
- 2 Press F2.
- 3 Use the arrow keys to move the insertion point to the place in the text you want to edit.



- For more information on properties, see the Object property reference in the online Help.
-

Inserting fields in text

You can insert fields within a text object in a form or report. This is especially useful in a report, because you can use this feature like a mail merge.

To insert fields in text

- 1 Open a form or report in the Design Window.
- 2 Click the text object.
- 3 Click inside the text object again so that the cursor appears inside the object.
- 4 Begin typing.
- 5 Press F5 to insert an unlabeled, undefined field.

- 6 Define this field as you would any other.

When you run the form or report, Paradox extracts the text value of the field and wraps it in its position within the line of text. The text following the field value is correctly spaced.

Example of inserting fields in a text object

Suppose you want to include the following line in a report using the Customer and Orders tables, with a Customer to Orders data model and a blank design layout.

“You have placed X orders for a total of \$X since you began doing business with us.”

To create the line



- 1 Using the *Field tool*, place a field object in the record band of the report. Define it as CUSTOMER.DB:Customer No.
- 2 Place another field object in the record band, only this time define the field as CUSTOMER.DB:Name.
- 3 Place a text object in the record band of the report.
- 4 In the text object, do the following:
 - Type “You have placed” and then press SPACEBAR to place a space between the text and the field value.
 - Press F5 to insert an undefined field.
 - Press SPACEBAR again to place a space after the field value, then type “orders for a total of.”
 - Press F5 to insert another undefined field.
 - Type, “since you began doing business with us.”
- 5 Select the first field object in the text object, then right-click the field object and define it as Count(ORDERS.Order No).
- 6 Select the second field object in the text object, then right-click the field object and define it as Sum(ORDERS.Total Invoice).
- 7 When you run the report, Paradox pushes or pulls the text surrounding the field objects to adjust for the size of the field values.



- If the text object's Line Squeeze property is enabled on the Run Time page of the Preferences page (Edit menu), and if there is only one field embedded in a line of text, and the field value is blank, Paradox blanks out the entire line of text that contains the blank field. A line of text is considered to be anything between two ENTER key strokes, and can be thought of as a paragraph. For more information on properties, see the Object property reference in the online Help.

Selecting text to change properties

When you specify properties for a text object, the way you select the text determines how Paradox applies the properties.

To change properties for the entire text object

- 1 Click away from the object.
- 2 Right-click the text object and click Properties.
- 3 In the Text Properties dialog box, specify properties for the text as appropriate.

Paradox applies the properties to all text in the text object.

To change properties for selected text

- 1 Drag to highlight the text.
- 2 Right-click the highlighted text and click Properties.
- 3 In the Text Properties dialog box, specify properties for the text as appropriate.

Paradox applies the properties only to the highlighted text.

To change properties for text you are about to type

- 1 Click within the text to place the insertion point in the text object but do not highlight any of the text.
- 2 Right-click the text object and click Properties.
- 3 In the Text Properties dialog box, specify properties for the text as appropriate.

Paradox applies the properties to any new text you type.

Specifying a font and typestyle for text

You can specify the font, typeface (for example, Courier or Times Roman), size, style (for example, bold or italic), and color of the text, by using the Text Formatting Toolbar and the text object property pages. You can also use the Properties dialog box.

To use the Text Formatting toolbar

- 1 Select the text object or highlight the text you want to change.
- 2 Click the appropriate tool on the Text Formatting Toolbar.

To use the Properties dialog box

- 1 Select the text object or highlight the text you want to change.
- 2 Right-click the text object or highlighted text and click Properties.
- 3 In the text Properties dialog box, specify properties for the text as appropriate.



- The typefaces available from the Typeface menu depend on which fonts are installed on your system.
-

Aligning text

You can align values in a field or table object, and you can align text in a text object and in the edit region of a field object. You can also use the Properties dialog box to align text.

To use the Text Formatting Toolbar

- 1 Select the field, table, or text object in the Form Design or Report Design Window.
- 2 Click an alignment tool on the Text Formatting Toolbar.

To use the Properties dialog box

- 1 Select the field, table, or text object in the Form Design or Report Design Window.
- 2 Right-click the object or highlighted text and click Properties.
- 3 Click the Text page.

- 4 Enable one of the following Alignment buttons:
 - Left — lines up text at the left, with the right edge ragged.
 - Center — clusters text in the middle of the object.
 - Right — lines up text at the right, with the left edge ragged.
 - Justify — spreads out text so both left and right margins are straight.



- Tabs, margins, indents, line spacing, and alignment options are also available from the expanded ruler.
-

Specifying the line spacing for text

You can specify the line spacing for text using the Text Formatting Toolbar or the Properties dialog box.

To use the Text Formatting Toolbar

- 1 Select the text object or highlight the text to change.
- 2 Click a line spacing tool on the Text Formatting Toolbar.

To use the Properties dialog box

- 1 Select the text object or highlight the text you want to change.
- 2 Right-click the text object or highlighted text and click Properties.
- 3 Click the Text page and set the Line Spacing property on the Text page.



- Tabs, margins, indents, line spacing, and alignment options are also available from the expanded ruler.
-

Specifying how a text object grows

Text objects in forms and reports grow and shrink to fit text differently, depending on how you create them. After you create a text object, you can specify how it resizes when the text within it grows and shrinks.

To specify how a text object grows

- 1 Right-click the text object and click Properties.

- 2 In the Design Sizing area of the General page, enable one of the following buttons:

- Fixed Size — wraps the text at the right border of the frame.

The object does not grow or shrink to fit the amount of text it contains. If you want to change the size of the object, select it and resize it manually.

- Fit Text — creates a single-row text object that expands to the right until you press ENTER, which moves the insertion point to a new line. As you continue typing, the text wraps at the right border that you defined by pressing ENTER.

The object grows or shrinks to fit the amount of text it contains.

- Grow Only — creates a single-row text object that works like Fit Text, except the object does not shrink when you remove text (unless you manually resize it using the handles).

The most common use for this type of text object is for a field label in a table.



- The Design Sizing choices control only how the object grows in the Design Window, not what happens when you run (view or print) the form or report.
-



EXCHANGING DATA

9

Paradox provides several ways to exchange data with other programs:

- Import or Export commands on the File menu can be used to open and save data in a variety of database, spreadsheet, and text formats.
- Object Linking and Embedding (OLE) can be used to insert files from an OLE server application into Paradox. When you place data into Paradox using OLE, you can then access the OLE source application directly from Paradox to make any changes you want. You can also use OLE to embed an entire Paradox table into another application's document.

Importing/exporting and OLE are both ways of exchanging information between applications. The difference between them is the method by which the information is exchanged. When you import or export a file, it must be converted to a format that can be understood by the application in which it is to be placed. This means that you must have a special filter installed on your system for each different file format. When you use OLE, you don't need to worry about filters or file formats. As long as all the applications involved support OLE, information can be freely exchanged.

- Dynamic Data Exchange (DDE) can be used to send field values from a Paradox table to other applications, or to send data from other applications to a Paradox table or query. Programmers can use DDE in ObjectPAL to send commands to other applications. Whereas Paradox supports an OLE field type that can store OLE data, DDE links cannot be stored in a table.
- File, Send can be used to transfer messages and attached files through MAPI-compliant mail systems such as Microsoft Exchange.



- You can also exchange information with client/server database applications using Structured Query Language (SQL). See Connecting to the SQL server in the online Help for details.

Sharing information between workstations

If you are sharing tables that are stored on a workstation's shared disk, the Local Share property for that workstation must be set to TRUE (using the Borland Database Engine Administrator, IDAPI or ODAPI utilities). Local Share only needs to be set to TRUE on the workstation that stores the tables. However, it is recommended that you set all your workstations to TRUE.

Setting the Local Share property

Configuring the Local Share property incorrectly can result in problems locking tables and records and the corruption of tables and indexes. To avoid problems entirely, you may want to set the Local Share property on all of your workstations to TRUE.

To set the Local Share property to TRUE

- 1 From the Start menu, click Start, Programs, Paradox 9, Utilities, Borland Database Engine 5.01.
- 2 Click the Configuration tab.
- 3 Open the Configuration/System folder so that INIT is displayed.
- 4 Click INIT.
- 5 In the Definition page, click Local Share to select it.
- 6 Choose TRUE from the Local Share list box.



- All BDE-based applications should be shut down when changing settings in the BDE Administrator.

Importing data

You can import data from a different file format to a Paradox or dBASE table. You can import only data files, not applications or forms. You can use the Text Import Expert to assist with importing fixed length and delimited text files. If the Expert is installed, you'll have an opportunity to use it when you click File, Import.

You can also import tables or lists from HTML files using the HTML Import Expert.

You can create a new table, replace data in an existing table, or add to data in an existing table. If you create a new table, Paradox defines its structure automatically. Then you can use Table Restructure to change it if you want.

Paradox imports files in the following formats:

- ASCII Delimited (.TXT, .CSV)
- ASCII Fixed (.TXT)
- dBASE tables (.DBF)
- Excel 3, 4, 5/95, 97 (.XLS)
- Lotus 1-2-3 v.1 (.WKS)
- Lotus 1-2-3 v.2 (.WK1)
- Paradox Tables (.DB)
- Quattro DOS (.WKQ)
- Quattro Pro DOS (.WQ1)
- Quattro Pro Windows 1 (.WB1)
- Quattro Pro Windows 6 (.WB2)
- Quattro Pro Windows 7, 8 (.WB3)
- Quattro Pro 9 (.QPW)

Determining field names

When you import files, you can enable the Use First Row Of Data As Field Names option. When it is enabled, Paradox generates field names from the first row of imported data that contains text. If Paradox cannot determine a field name from the imported file, it generates new field names beginning with the name FIELD001. Additional new field names are numbered FIELD002, FIELD003, and so on.

If more than one field seems to have the same name, Paradox adds letters to the duplicate fields (for example, CustomerA and CustomerB).

Importing spreadsheet data

When you import spreadsheet data, you can select a specific block in the spreadsheet to import, or you can import the entire spreadsheet. To avoid conversion problems, you should edit the spreadsheet before importing. For best results, do the following:

- Remove extraneous entries (such as hyphens, asterisks, and exclamation points).
- Make sure each column contains only one kind of data and uses only one formatting option.
- When importing dates, ensure you import year dates with all four digits to avoid confusion about the implied century.
- Place column titles in the top row of the selected range because Paradox uses the first row that contains text to generate field names. (If there are no column titles on the spreadsheet, disable the Use First Row Of Data As Field Names check box in the Spreadsheet Import dialog box.)
- Make sure both the spreadsheet you are importing into Paradox and the destination table in Paradox are closed (if you are importing into an existing table). Otherwise, Paradox assumes the items are in use.

To import spreadsheet data

- 1 Click File, Import.
- 2 Click the Import button.
- 3 Type the full path and filename of the spreadsheet you want to import in the From box, or press “...” to browse your files.
- 4 Type the name of the table into which you want to import data in the To box, or press “...” to browse your files.
- 5 If you are importing data into an existing table, enable one of the following buttons:
 - Overwrite Existing Table—imports data over existing table data.
 - Append To Existing Table—imports data without affecting existing records.
- 6 If you want Paradox to create a table called Problems.db if errors occur while importing, enable the Write Transfer Failures To Problems.db check box.
- 7 Click the From Spreadsheet page to bring it to the front and enable the Use First Row Of Data As Field Names check box if you want Paradox to use the first row of data in the spreadsheet as field names.
- 8 If you don’t want to import the entire file, specify the range you want to import by specifying the spreadsheet and cell information. For example, if you wanted to import cells A1 to B4 from spreadsheet A, you would enter the following range: **A:A1..A:B4**.

By default, Paradox displays the table and any auxiliary tables on completion.

Determining spreadsheet field types

When you import data from a spreadsheet, Paradox automatically assigns field types to the data. The following table shows how Paradox determines a field's type.

Spreadsheet value	Paradox field type	dBASE field type
Labels	Alpha	Character
Integers	Short, Long Integer, or Number (depends on value)	Float number (6,0) or more (depends on value)
Decimal numbers	Number	Float number (20,4)
Money	Money	Float number (20,4)
Dates	Date	Date
Date/Time (Excel)	Timestamp	Character
Time (Excel)	Time	Character

The following rules determine which category a column falls into. The data type for a column is whatever data type can hold all the values in the column.

A column containing	is converted to
Label (text) cell	Alpha field (or dBASE character field)
Dates and numbers	Alpha field (or dBASE character field)
Money only	Money field in a Paradox table
Money and numbers	Number field
Dates and times	Timestamp field (or dBASE character field)

As a result of these conversion rules, Paradox often imports numbers in unedited spreadsheets as alpha fields. For example, spreadsheet columns often have rows of hyphens separating sections of numbers. Since only an alpha field can contain both the numbers and hyphens, the column is converted to an alpha field even though it contains mostly numbers.



- Dates are formatted to the Windows short format. Numbers are formatted to the Windows number format.

Importing from a table

Paradox lets you import data from tables in other programs. Paradox may need to convert the data in the other application into a different format before it can be accessed.

To import data

- 1 Click File, Import.
- 2 Click the Import button.
- 3 Type the full path and filename of the file you want to import in the From box.
- 4 Type the name of the table into which you want to import data in the To box.
- 5 If you are importing data into an existing table, click the To Table page and enable one of the following buttons:
 - Overwrite Existing Table—imports data over existing table data.
 - Append To Existing Table—imports data without affecting existing records.
- 6 If you want Paradox to create a table called Problems.db if errors occur while importing, enable the Write Transfer Failures To Problems.db check box.
- 7 If you are importing records to an existing file, enable the Write Duplicate Key Records To KeyViol.db check box if you want Paradox to write key violation errors to a separate table.
- 8 Click the Import button.

By default, Paradox displays the imported table and any auxiliary tables when the import operation is complete.

Importing delimited text

You can use the Import command to import delimited text files. Delimited text is text that is separated and/or enclosed by the characters you specify. In order to read the file, each line of the text file you want to import must end with a carriage return/linefeed combination to mark the end of a record. By default, Paradox expects the fields in the text file to be separated by commas with quotation marks surrounding each text field; however, if your file uses other characters, you can specify them in the Import dialog box.

When you import a delimited text file, Paradox scans the file to determine the number of fields and the field types the file contains. Dates are formatted to the Windows short format. Numbers are formatted to the Windows

number format. Paradox trims strings longer than 255 characters. It stores these as alpha fields.

Importing delimited text involves specifying the files you want Paradox to create during the import and then specifying the format of the delimited text in the source file so that Paradox interprets it correctly.

To specify the files you want Paradox to use

- 1 Click File, Import.
- 2 Click the Import button.
- 3 Type the full path and filename of the file you want to import in the From box.
- 4 Type the name of the table into which you want to import data in the To box.
- 5 If you are importing data into an existing table, enable one of the following buttons:
 - Overwrite Existing Table—imports data over existing table data.
 - Append To Existing Table—imports data without affecting existing records.
- 6 If you want Paradox to create a table called Problems.db if errors occur while importing, enable the Write Transfer Failures To Problems.db check box.
- 7 If you are importing data into existing data, enable the Write Duplicate Key Records to KeyViol.db check box if you want Paradox to write any duplicate key values to a KeyViol table.

To specify the format of the source file

- 1 Click the From Text page to bring it to the front.
- 2 In the Fields Separated By section, specify how the field values in the source file are separated by enabling the appropriate button. You can choose commas, semicolons, tabs, or choose Other and type the character you want to use.
- 3 In the Fields Delimited By section, specify the characters that surround values in the source file by enabling the appropriate button. You can choose quotation marks, nothing, or choose Other and type the character you want to use.
- 4 In the Delimited Fields section, specify whether data from all field types or only from text field types (alpha or character) are separated with the character you chose in step 3.

- 5 In the Character Set section, specify the character set you want to use by enabling either the OEM or ANSI button.
- 6 Enable the Use First Row Of Data As Field Names if you want Paradox to use the first row of data in the source file as field names.

By default, Paradox displays the table and any auxiliary tables on completion.



- You can also import delimited text with the help of the Text Import Expert. To activate the Expert, click File, Import and click the Text Expert button.
-

Importing fixed length text

You can import data from fixed length text files using the Import command (File menu). When you import text, each line of the text file you want to import must end with a carriage return/linefeed combination to mark the end of a record.

When you import a fixed length text file, you can define the field names and types of the fields in the new table. For each field name, you will need to enter a Type for the target table, a Start position (the position in the source where the column starts), and a Length (the source file's field size). Otherwise, Paradox assumes there is one alpha field in the first column of the table with a length of 255 characters. Dates are formatted to the Windows short format. Numbers are formatted to the Windows number format.

If you have previously imported data and saved the specifications, you can reload them. Similarly, once you set your import specifications, you can save them for later use.

Importing fixed length text involves specifying all the files you want Paradox to use and/or generate, and then defining the name, type, and size of each field in the source file.

To specify the files you want Paradox to use

- 1 Click File, Import.
- 2 Click the Import button.
- 3 Type the full path and filename of the file you want to import in the From box.
- 4 Type the name of the table into which you want to import data in the To box.

- 5 If you are importing data into an existing table, click the To Table page and enable one of the following buttons:
 - Overwrite Existing Table—imports data over existing table data.
 - Append To Existing Table—imports data without affecting existing records.
- 6 If you want Paradox to create a table called Problems.db if errors occur while importing, enable the Write Transfer Failures To Problems.db check box.
- 7 If you are importing records to an existing file, enable the Write Duplicate Key Records To KeyViol.db check box if you want Paradox to write key violation errors to a separate table.
- 8 In the Character Set section of the To Text page, choose the character set you want to use by enabling either the OEM or ANSI button. Files created in DOS-based applications, like Edit, typically use the OEM character set. Files created in Windows applications, like Notepad, typically use the ANSI character set.

To define the fields from the source file

- 1 Click the From Fields page to bring it to the front.
- 2 If you want to use a previously saved specification, click Load Spec and choose the appropriate file. You can then modify the specification.
- 3 Type the name of the first table field in the Field Name box.
- 4 Type the field type in the Type box.
- 5 Type the column at which that field starts in the text file in the Start box.
- 6 Type the length of the field in the Length box.
- 7 Repeat steps 3 to 6 for each field.
- 8 If you want to save the export specifications, click the Save Spec button and type a filename for the file in the File Name box of the Save Import Specification As dialog box.

Warning!

- Importing and exporting of date information depends on the mode setting in the BDE. For example, the date 12/20/98 will fail if the mode setting is anything other than m/d/y or 0. You must change your settings in the BDE to correspond with the date you are importing or exporting for the date to transfer correctly. All other dates in Paradox are affected by this change.



- You can also import fixed length text with the help of the Text Import Expert. To activate the Expert, click File, Import and click the Text Expert button.
-

Exporting data

You can export data from Paradox tables to the following file formats:

- ASCII Delimited text (.TXT, .CSV)
- ASCII Fixed length text (.TXT)
- dBASE 5 (.DBF)
- dBASE III+ (.DBF)
- dBASE IV (.DBF)
- Excel 3, 4, 5/95, (.XLS)
- Lotus 1-2-3 v.1 (.WKS)
- Lotus 1-2-3 v.2 (.WK1)
- Paradox 3.x 'Compatible' (.DB)
- Paradox 4.x 'Standard' (.DB)
- Paradox 5, 7, 8 (.DB)
- Quattro DOS (.WKQ)
- Quattro Pro DOS (.WQ1)
- Quattro Pro Windows 1, (.WBI)
- Quattro Pro Windows 5 (.WB1)
- Quattro Pro Windows 6 (.WB2)
- Quattro Pro Windows 7, 8 (.WB3)
- WordPerfect 8, 9 (.WPD)
- WordPerfect 8, 9 Merge File (.WPD)



- In order to export a file in WordPerfect format, you must have WordPerfect installed on your system.
-

Exporting to a spreadsheet

You can export table data to a variety of spreadsheet applications. When you export data to a spreadsheet, Paradox converts each record to a row and each field to a column. If a value is wider than the column display width, the full value is converted but partially hidden.

If a date in the original table is beyond the range of the allowable dates in the spreadsheet, the date is exported as the value ERROR.

To export to a spreadsheet

- 1 Click File, Export.
- 2 If the table you want to export is not already listed in the From box, click the “...” button and choose a table.
- 3 From the To Type list box, choose the spreadsheet format you want to export to.
- 4 If you want Paradox to write field names as the first row of data, click the To Spreadsheet page and enable the Use First Row Of Data As Field Names check box.



- Paradox cannot export memo (Paradox or dBASE), formatted memo, graphic, OLE, or binary field types to spreadsheets. These types will not be included in the exported text file.
- Dates are exported to spreadsheets as integers representing that date. Format your date column in the spreadsheet as a date to see them properly.

Exporting to a table

When you export data to a table, you can create a new table or modify an existing one.

To export data to a table

- 1 Click File, Export.
- 2 If the table you want to export is not already listed in the From box, click the “...” button and choose a table.
- 3 From the To Type list box, choose the type of table you want to export to.
- 4 Type the full path and name of the file you want to export to in the To box.

- 5 If you are exporting to an existing table, enable one of the following buttons:
 - Overwrite Existing Table—overwrites the existing table data.
 - Append To Existing Table—adds new records to the existing table without affecting existing data.
- 6 If you want Paradox to create a table called Problems.db if errors occur while exporting, enable the Write Transfer Failures To Problems.db check box.
- 7 If you want Paradox to create a table called KeyViol.db if records with duplicate key field values are found while exporting, enable the Write Duplicate Key Records To KeyViol.db check box.

By default, Paradox displays the table and any auxiliary tables on completion.

Exporting to delimited text

You can export a table to a text file in which the table's field values are separated and/or enclosed (delimited) by the characters you specify. By default, field values in the exported file are separated by commas, and non-numeric values are enclosed in double quotation marks. Each record is separated by a carriage return and a linefeed character. Dates, numbers, and times are formatted as specified in the BDE Configuration Utility program (available in the Paradox program group).

To export to delimited text

- 1 Click File, Export.
- 2 If the table you want to export is not already listed in the From box, click the "..." button and choose a table.
- 3 From the To Type list box, choose ASCII Delimited.
- 4 In the Fields Separated By section, choose how you want field values to be separated in the exported file by enabling the appropriate button. You can choose commas, semicolons, tabs, or choose Other and type the character you want to use.
- 5 In the Fields Delimited By section, choose the characters you want to surround values in the exported file by enabling the appropriate button. You can choose quotation marks, nothing, or choose Other and type the character you want to use.
- 6 In the Delimited Fields section, choose whether you want to surround data from all field types or only from text field types (alpha or character) with the character you chose in step 5.

- 7 In the Character Set section, choose the character set you want to use by enabling either the OEM or ANSI button.
- 8 Enable the Use First Row Of Data As Field Names if you want Paradox to place the field names in the first row of data.



- Paradox cannot export memo (Paradox or dBASE), formatted memo, graphic, OLE, or binary field types to delimited text. These types will not be included in the exported text file.
-

Exporting to fixed length text

You can export a table to a text file in which each record is the same length.

When you export to a fixed length text file, you can use the To Fields page of the Export dialog box to define the field names and types of the fields in the new table. Dates, numbers, and times are formatted as specified in the BDE Configuration Utility program (available in the Paradox program group). These settings are called the export specifications.

If you have previously exported data and saved the specifications, you can reload them. Similarly, once you set your export specifications, you can save them for later use.

To export to fixed length text

- 1 Click File, Export.
- 2 If the table you want to export is not already listed in the From box, click the (...) button and choose a table.
- 3 In the To Type list box, choose ASCII Fixed.
- 4 In the Character Set section of the To Text page, choose the character set you want to use by enabling either the OEM or ANSI button.
- 5 To display the export specifications, click the To Fields page and click Reset.
- 6 To save the export specifications, click Save Spec and type a filename for the file in the File Name box

Warning!

- Importing and exporting of date information depends on the mode setting in the BDE. For example, the date 12/20/98 will fail if the mode setting is anything other than m/d/y or 0. You must change your settings in the BDE

to correspond with the date you are importing or exporting for the date to transfer correctly. All other dates in Paradox are affected by this change.



- When you export to a fixed length file, a file with extension .SCH is created in the same directory. The .SCH file contains this information about the new file: table name, new file type, character set used. It also contains descriptive data for each field, including name, type, size, decimal placement, and column start location (in spaces).



- If you want to use a previously created export specification, click the Load Save button instead of the Reset button.

Using Object Linking and Embedding (OLE)

You can use OLE fields to hold virtually any kind of data, from graphics to text to calculations. The advantage of using an OLE field is that once you place a linked OLE value, it maintains a link to its source application. You can always open the source application from the OLE object that you place in a Paradox table or form. Changes you make to the OLE object are then updated in your Paradox table or form.

An OLE container can hold different kinds of data, such as images, sound, and documents. Paradox provides two types of OLE containers: fields in tables, and design objects in forms or reports. OLE fields and design objects can be used to store, view, and manipulate this data without leaving Paradox.

How you can manipulate an object depends upon the kind of OLE server associated with the object. For example, a sound (.WAV) file might be associated with a sound editor that provides two commands: play and edit.

To see how you can manipulate the current OLE object, choose the Edit menu. The last command shows the OLE server-specific command. Choose this to view a submenu of available server-specific commands.

Another way to see what you can do with the OLE value is to right-click it in a table (you must click View, Field View first). You'll see a menu of available commands. If the value is linked, you'll see the Update Now command which you can use to force an update whenever you want.

The most common commands for OLE values are Edit and Open. If you choose Edit on an embedded OLE value, you can use in-place editing to change the value. If you choose Open on a linked or embedded OLE value, Paradox opens the server application with the OLE file active.

Most server applications use OLE 2.0, but a few might still use OLE 1.0, which doesn't support in-place editing. For more information on the difference between edits and updates in these versions of OLE, see "OLE 1.0 versus OLE 2.0" on page 487.

Understanding OLE

Object Linking and Embedding (OLE) provides a way for a data file from one application (for example, a Paradox table) to contain data from another application (for example, a spreadsheet). OLE makes it possible for you to view and edit this data in Paradox without ever leaving Paradox. For example, you can use OLE to link or embed a CorelDRAW™ image in a graphic field of a table. In this example, Paradox acts as the OLE container and CorelDRAW acts as the OLE server.

Paradox can act as both an OLE container and an OLE server.

Paradox as an OLE container

OLE containers can be added to tables, forms, and reports. For example, you could add an OLE field to a table you use to organize sound (.WAV) files, allowing you to actually store, play, and edit the .WAV files inside the Paradox table. Paradox provides OLE containers in two ways: as a field in a table and as a design object in a form or report.

You can insert two kinds of objects into an OLE container: embedded objects and linked objects.

Paradox as an OLE server

Paradox acts as an OLE server by providing a way to insert a Paradox table in another application's file, such as a WordPerfect or Quattro Pro file.

Depending on the type of OLE object, you can manipulate the object in various ways: open, edit, view, or play it. For more information, see "Manipulating the contents of an OLE field or design object" on page 484.

Embedded OLE objects

An embedded object is one you create or copy from a file or the Clipboard. When you embed an object in an OLE container, the data is actually copied into the OLE container, and no relationship is maintained with the source of the data. For example, suppose you copy an image from CorelDRAW to the Clipboard and paste it in an OLE design object in a Paradox form. You can edit and format the object in the form using CorelDRAW; however, the original file from which you copied the image stays unchanged. Furthermore, if you copy the form to a disk, the image is copied along with the form.

Another type of OLE object is linked, not embedded. For more information, see “Linked OLE objects” on page 478.



- Paradox provides OLE containers in two ways: as a field in a table and as a design object in a form or report.
- If the OLE object is embedded in a table field instead of a design object, it is stored in the .MB file with other table data.

Linked OLE objects

A linked object is actually a pointer to data somewhere outside of the OLE container. When you insert a linked object in an OLE container, changes you make to the object are actually made to the source of the object. Furthermore, if you change the source of the object, the object changes in the OLE container. Using linked OLE objects is helpful when you need to display live data that is automatically updated whenever the original data changes in another application. OLE links can also produce smaller file sizes than when you embed large objects (such as graphics files) because the object itself stays in another file.

For example, suppose you insert a link to a WordPerfect document in an OLE field in a Paradox table. Later, you modify the WordPerfect document. Your modifications also appear in the field in the table. If you copy the Paradox table to a disk, the text from the WordPerfect document is not copied along with the table.

You can make Paradox update the appearance of linked objects automatically. You can also choose to update their appearance manually.

Another type of OLE object is embedded, not linked. For details, see “Embedded OLE objects” on page 477.



- Paradox provides OLE containers in two ways: as a field in a table and as a design object in a form or report.

Embedding objects in OLE fields and design objects

To make a table, form or report more interesting and informative, you can include data such as pictures, detailed notes, spreadsheets, graphics, charts, and similar items. Often these files exist in other applications, or can be created in them. When you define a field type as OLE, or a design object as an OLE container, you have created an area in which you can embed special

data from other sources. Paradox lets you browse your other applications and choose the file that you want to embed in your table, form, or report.

Embedding a new OLE object

Paradox does not limit you to placing existing values in OLE fields. You can create a new value using an OLE server directly from Paradox.

To create a new OLE object and embed it in an OLE field

- 1 Press F9 to switch to Edit mode.
- 2 Select the OLE field.
- 3 Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
- 4 Right-click and choose Insert Object.
- 5 In the Insert Object dialog box, enable the Create New button.
- 6 From the Object Type list, choose the program you want to use to create the object.

If you want Paradox to display the value as an icon in the field, enable the Display As Icon check box.

- 7 Click OK.

If the OLE object comes from an OLE 2.0 server application, Paradox places a blank OLE object in the field and creates an in-place editing environment where you can use the server application's standard commands and toolbar buttons to create the new object.

If the server uses OLE 1.0, the server application opens and you can edit the object within it.

- 8 Create the object using the chosen application.

When you are finished creating the object, close the OLE server (the other program) by clicking somewhere outside of the OLE object. Paradox embeds the object in the OLE field.

To create a new OLE object and embed it in a form or report

- 1 Open a form or report.
- 2 Click View, Design Form or View, Design Report to enter Design mode.
- 3 Use the OLE tool to create a design object (box) to hold the OLE object.
- 4 Follow steps 4 to 8 in the above procedure.



- To create a new linked OLE object instead, see “Inserting an OLE object linked to a file” on page 482.

Embedding a copy of a file as an OLE object

If the OLE object you want to embed already exists, you can browse your applications while in Paradox and choose the file you want to embed.

To embed a copy of a file in a table

- 1 Press F9 to switch to Edit mode.
- 2 Select the OLE field.
- 3 Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
- 4 Right-click and choose Insert Object.
- 5 Enable the Create From File button.
- 6 Type the full path and filename of the file you want to embed in the OLE field in the File box.

Paradox embeds a copy of file in the OLE field.

To embed a copy of a file in a form or report

- 1 Open the form or report.
- 2 Click View, Design Form or View, Design Report to enter Design mode.
- 3 Use the OLE tool to create a design object (box) to hold the OLE object.
- 4 Follow steps 4 to 6 in the above procedure.



- To create a linked OLE object instead, see “Inserting an OLE object linked to a file” on page 482.

Embedding part of a file as an OLE object

Paradox lets you go to another application, make a copy of the object you want in your table, form, or report, and copy and paste it back to your database.

To embed part of a file using Copy and Paste

- 1 Open the OLE server (the program used to create the file you want to embed) and select the value (such as text, a graphic, a number) you want to place into Paradox. Then, use that program's Copy command to copy the data to the Clipboard.
- 2 Go back to Paradox.
- 3 Do one of the following:
 - If you are embedding the object in an OLE field in a table or in a form bound to that table, press F9 to switch to Edit mode. Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
 - If you are embedding the object in an OLE design object in a form or report, click View, Design Form or View, Design Report to enter Design mode and select the object.
- 4 Click Edit, Paste.

The OLE value appears in the field as an embedded OLE object.



- To create a linked OLE object, see "Inserting an OLE object linked to part of a file" on page 483.
-

Embedding a Paradox table

You may want to insert a copy of a Paradox table in another application such as a word processor or a desktop publishing program. You can embed an entire Paradox table in another application by using the Clipboard or the Insert Object command.

To place a Paradox table in another application using the Clipboard

- 1 In Paradox, open the table.
- 2 Click Edit, Select All.
- 3 Click Edit, Copy.

- 4 In the OLE container application, choose the command that the application uses to embed OLE objects. Some commonly used commands are Edit, Paste, Edit, Paste Special or Edit, Paste Link.

The Paradox table appears in the other program (the container). You can edit the table by either opening Paradox from the OLE container or using in-place editing.

To embed a Paradox table using the Insert Object command

- 1 In the OLE container application (not Paradox), click Edit, Insert Object or Insert, Object (depending on the commands available from the OLE program).
- 2 In the Insert Object dialog box, choose Paradox Table from the Object Type list and click OK.
- 3 The OLE container launches Paradox (if it wasn't already running) and Paradox opens the Open Table dialog box. Choose the table you want to embed.
- 4 Paradox opens the selected table. Close the Table window to return to the OLE container. The Paradox table appears in it.

Inserting linked OLE objects

If you want objects such as spreadsheets, photographs, or charts in your table, you must insert and link the object to your OLE field. An OLE linked object is stored in its original application. When the original file is updated, so is your OLE field by virtue of the link you have defined. You can decide whether you want these updates to appear automatically or if you want to manually update the object.

Inserting an OLE object linked to a file

If you want your database to include a field with information that is constantly updated, such as a spreadsheet or sales report, you can link the object to a Paradox table. The object is contained in its original server program.

To insert an OLE object linked to a file into a table

- 1 Press F9 to switch to Edit mode.
- 2 Select the OLE field.
- 3 Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
- 4 Right-click and choose Insert Object.

- 5 Enable the Create From File button.
- 6 Type the full path and filename of the file you want to embed in the OLE field in the File box.
- 7 Enable the Link check box.

To insert an OLE object linked to a file into a form or report

- 1 Open the form or report
- 2 Click View, Design Form or View, Design Report to enter Design mode.
- 3 Use the OLE tool to create a design object (box) to hold the OLE object.
- 4 Follow steps 4 to 7 in the above procedure.



- To create an embedded OLE object instead, see “Embedding a copy of a file as an OLE object” on page 480.
-

Inserting an OLE object linked to part of a file

You may want to select only part of a file to insert in your OLE field or design object.

To insert an object linked to part of a file using Copy and Paste Special

- 1 Open the OLE server (the program used to create the file you want to link) and select the value (such as text, a graphic, a number) you want to place into Paradox. If you are creating a new file or make changes to the file, you must Save the changes before you copy the data.
- 2 Use that program's Copy command to copy the data.
- 3 Go back to Paradox.
- 4 Do one of the following:
 - If you are embedding the object in an OLE field in a table or in a form bound to that table, press F9 to switch to Edit mode. Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
 - If you are embedding the object in an OLE design object in a form or report, click View, Design Form or View, Design Report to enter Design mode.

- 5 Select the OLE field or OLE design object in which you want to paste the OLE object.
- 6 Click Edit, Paste Special.

The OLE value appears in the field as a linked OLE object. To create an embedded OLE object with the Clipboard, see “Embedding part of a file as an OLE object” on page 480.

Manipulating OLE objects in tables, forms, and reports

Just as you can edit data in alpha or money fields, you can edit objects in OLE fields. While in Paradox, you can edit the OLE object in its source application whether the object is linked or embedded. If you have instructed Paradox to update a linked OLE object automatically, the changes will appear as soon as you return to your field or design object. If you have chosen to update manually, you can use the Update Now command as soon as you are finished editing.

Manipulating the contents of an OLE field or design object

An OLE field in a table can be edited or otherwise manipulated either through the table or through a form that is bound to that table.

To manipulate an OLE object in a table

- 1 Press F9 to switch to Edit mode.
- 2 Click the OLE field to select it.
- 3 Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
- 4 Click the Edit menu. The last command on the Edit menu is the name of the OLE server associated with the object in the OLE field. Choose this command to display a submenu and then choose one of the commands from the submenu.

When you’ve finished editing the object, save it and close the source application.

To manipulate an OLE object in a form or report

- 1 Do one of the following:
 - If the OLE design object is in a form, click View, Design Form to switch to Design mode.
 - If the OLE design object is in a report, click View, Design Report to switch to Design mode.

- 2 Click the OLE design object to select it.
- 3 Follow step 4 in the above procedure.



- When you are finished manipulating a linked OLE object, Paradox updates it automatically if you have specified this in the Links dialog box. If you have specified that you want to update the OLE object manually, you can use the Update Now command. For more information, see “Updating a linked OLE object” on page 485.



- Double-clicking the OLE field executes the default command (the first command in the submenu), usually Edit.
- If you are manipulating this object using a form, right-click the field. The commands available for this object appear on the menu. If you are manipulating this object using a table, press F2 to switch to Field View and then right-click the field.

Updating linked OLE objects

You choose to link an OLE object because you know the object is not static and will change in its source application. You want your table, form or report to contain the latest versions of the object.

Paradox can update your linked OLE object automatically; however, you may also choose to do it manually.

Paradox also allows you to change or break OLE links. Use the Links dialog box to manage links between OLE objects in Paradox and their source files.

Updating a linked OLE object

You can update your linked OLE object to reflect changes that have occurred in the OLE server.

To update a linked OLE object in a table

- 1 Press F9 to switch to Edit mode.
- 2 Select the OLE field.
- 3 Click View, Memo View if your OLE field is a memo field, or View, Field View if your OLE field is a BLOB field.
- 4 Click Edit, Links.

- 5 Do one or more of the following:
 - Use the Update buttons to choose whether you want the selected link to be updated manually (when you choose) or automatically.
 - Choose Update Now to immediately make the appearance of a linked object match that of its source. See “Manually updating a linked object” on page 486 for more information.
 - Choose Open Source to open the server application and source file of the selected link.
 - Choose Change Source to change the source file of the selected link. Paradox opens the Change Source dialog box. Use this to choose a new source file for the link.
 - Choose Break Link to break the link. This causes the selected OLE value to become a static, embedded object. Now the object can’t be automatically updated when the source data changes.

To update a linked OLE object in a form or report

- 1 Open the form or report.
- 2 Click View, Design Form or View, Design Report to enter Design mode.
- 3 Select the OLE object.
- 4 Follow steps 4 and 5 in the above procedure.

Manually updating a linked object

After you have edited your OLE object, you can update the object to show the changes whenever you want. Make sure you have clicked Manual in the Links dialog box.

To update your object manually

- 1 Do one or both of the following:
 - If you are working with an OLE field in a table or in a form bound to that table, press F9 to switch to Edit mode. Also, make sure you are not in Field View mode.
 - If you are working with an OLE field object in a form or report, click View, Design Form or View, Design Report.
- 2 Click the OLE field or design object to select it.
- 3 Click Edit, Links, Update Now.

OLE 1.0 versus OLE 2.0

Some objects behave differently from other objects when manipulated. Differences are sometimes due to the version of OLE supported by an OLE server. There are two kinds of OLE servers: OLE 1.0 and OLE 2.0.

OLE 1.0

When you manipulate an object from an OLE 1.0 server, Paradox launches the OLE server (the program used to create the OLE object) to let you work with the object. After you finish working with the object, close the OLE server to return to Paradox and save the changes to the object.

For example, suppose an OLE field contains a word processing document, and you choose the Edit command. Paradox opens the document in the word processor. You make some changes to the document and close the word processor. A dialog box appears, asking if you want to save the changes to the object. You choose OK and return to Paradox. The object in the OLE field is updated with the changes you made.

OLE 2.0

When you manipulate an object from an OLE 2.0 server, different commands may cause different actions. Typically, one command (Open) launches the OLE server (the program used to create the OLE object). Another command (Edit) initiates in-place editing. With in-place editing, all the tools and menus you need appear inside the Paradox desktop. In essence, the OLE server takes control of the Paradox desktop, including the toolbar, the status line, and the menus. The area inside the OLE field becomes the working area for the OLE server. The only menus that Paradox still controls are File and Window. To end in-place editing and restore the standard Paradox environment, click the table or form outside the OLE field or design object.

For example, suppose an OLE field contains a video file, and you choose the Play command. Video controls appear at the bottom of the OLE field and some new menu commands appear on the Paradox desktop. The video plays inside the OLE field. You use the video controls to pause and jump to another frame in the video. You click another field in the table to close the video player.

Using Paradox as an OLE 2.0 server

You can embed existing Paradox tables in OLE container applications such as word processors or spreadsheets. To do this, you can use the Edit, Insert Object command or the Windows Clipboard.

If the container application supports OLE 2.0, you can use in-place editing to edit the Paradox table. When you use in-place editing, certain functions are unavailable:

- You cannot right-click the table to see its properties.
- You cannot enter Memo View.
- Certain prohibited menu commands are not visible.

The Paradox table you place in the container always maintains a relationship with the Paradox source table. This means if you delete the Paradox file from disk, it will no longer appear in the OLE container (even if it was embedded in the OLE container).

Using Dynamic Data Exchange (DDE)

Dynamic Data Exchange (DDE) lets you communicate with other applications that support DDE. You can use DDE to send field values from a Paradox table to other applications or to send data from other applications to a Paradox table or query.

DDE links are shown as text, not icons or data. For an example, see “Using Paradox as a DDE client (tables)” on page 489.

Using Paradox as a DDE server

When you take the values from a Paradox field and place them in another application, you are using Paradox as a Dynamic Data Exchange (DDE) server.

Using Paradox as a DDE server

Suppose you have a spreadsheet that performs a series of calculations on a value. The value you want to perform the calculations on is in a field of a Paradox table.

- 1 With the appropriate Paradox table open, select any value in the field, then choose Edit, Copy to copy the field to the Clipboard.
- 2 In the DDE client spreadsheet, use Paste Special to place the field in the appropriate spreadsheet cell. In the Paste Special dialog box, enable the Paste Link button.

Remember, you are not placing an actual value in the spreadsheet. Instead, you are using DDE to tell the spreadsheet where to look for the value.

As you move through the records of your Paradox table, the values in the spreadsheet change because the value in the field is different for different

records. The spreadsheet displays the field value for the selected Paradox record.



- You can use DDE to place Paradox fields in any type of application that is a DDE client. Spreadsheets, word processors, and a variety of other applications can accept Paradox field values through DDE.
- To link an entire table through DDE, click Edit, Select All, and then Edit, Copy.

Example of Paradox as a DDE server

Suppose you want to place a Paradox field's value in a cell in a Quattro Pro for Windows spreadsheet. The following example shows how to do this using the sample Orders table.

- 1 In Paradox, open the Orders table. Select the first record's Total Invoice value.
- 2 Click Edit, Copy.
- 3 Open Quattro Pro for Windows, select a notebook cell and click Edit, Paste Special.
- 4 Enable the Paste Link button in the Paste Special dialog box.
- 5 To see how DDE works, place your Paradox window and your Quattro Pro window together on the screen.
- 6 Select the Total Invoice field in Paradox and press the up and down arrows to move through invoice values. Notice how the value shown in the notebook cell in Quattro Pro changes to display the Total Invoice value in the currently selected Paradox record.



- In Quattro Pro, you can create calculations that use the value from Paradox. As the DDE value is updated, the calculated result is updated along with it.

Using Paradox as a DDE client (tables)

When you use Paradox as a DDE client, you place link information about a value from another application into an alpha field in a Paradox table.

A common use of Paradox as a DDE client is to use values from another application and perform queries on them in Paradox.

To use Paradox as a DDE client

- 1 Copy the value you want to use (your DDE server can be a spreadsheet, word processor, or any other DDE-capable application).
- 2 In Paradox, click the alpha field where you want to place the DDE value and then click Edit, Paste Special.

You see link information like:

```
@DDE:"QPW"! "C:\QPW\notebk1.wb1"! "$A$D$2"!@.
```

This is a string that tells Paradox where to look for the DDE value. This example string tells Paradox to look for a Quattro Pro for Windows file located on C:\QPW in Notebook 1, page A, cell D2.



- In Paradox, you view the link information rather than the DDE value. To view the value in the DDE server, select the field and press Shift + F2. Paradox displays a message telling you it is launching the DDE server and then opens the application and the correct file.
- The alpha field must be large enough to hold link information.

Using Paradox as a DDE client (queries)

To use Paradox as a DDE client (queries)

- 1 Highlight the item in the server, then copy it to the Clipboard. Most servers use Edit, Copy to place a copy of the object on the Clipboard.
- 2 Return to the client (Paradox) Query window.
- 3 Select the QBE field to receive its value from the server.
- 4 Click Edit, Paste Link from the menu.
- 5 Click Query, wait for DDE to tell Paradox to execute the query each time data is sent from the server.

Example of Paradox as a DDE client and server (queries)

When you use Paradox as both DDE client and server, all actions can be performed within Paradox.

For example, a linked field can run a query (the DDE client). When the field value changes in the source table (DDE server), an updated Answer table appears.

Using DDE to run a query

Suppose you want to run a separate query for each customer in the Customer table. Follow these steps:

- 1 Click File, New, Query
- 2 Choose Lineitem.db and Orders.db, and click Open.
- 3 Click the checkboxes for the Orders field in both the Lineitem and Orders tables.
- 4 Open Customer in a Table window, click File, Open, Table, double click the Customer.db table.
- 5 Select Customer No. 1221 and click the Copy button on the toolbar.
- 6 In the Query window, position the text insertion point in the Customer No. field of the Orders table, and click Edit, Paste Link. Link information from the Customer table appears in the field.
- 7 Click Query, Run Query. Paradox creates an Answer table listing all of Customer No. 1221's items.

Using DDE to run a query interactively

- 1 Create a DDE link following steps 1 to 5 of the above procedure.
- 2 Click the Query window's title bar to activate the window.
- 3 Click Query, Wait for DDE.
- 4 Click the Customer table's title bar to activate the window and select Customer No. 1221.
- 5 Press the Down arrow to move to Customer No. 1231. When you select the new value, Paradox activates the DDE link and runs the query again, updating the Answer table with the new value's data.



- You can click Query, Wait for DDE so that there is no check mark beside the menu command if you want to scroll quickly through the Customer table without running a query on each record's value.
-

Disconnecting a DDE link

After a DDE link is pasted into a DDE client application, the Notify On command is activated in Paradox. While this command is active, the link is live. For example, when you select another record in the linked table (in Paradox), the new value is delivered to the DDE client.

To disconnect the link

- Click Format, Notify On so that no check mark appears beside the menu option in Paradox.

While this command is inactive, no changes are delivered to the DDE client.

To reconnect the link at any time

- Click Format, Notify On so that a check mark appears beside the menu option in Paradox.



- If you create a DDE link to an entire table, Format, Notify On works similarly. When any record in the linked table changes, the entire table is refreshed in the DDE client. Changes are posted in the table whenever the person editing the table moves off the record.
 - The Notify On is activated only if the Wait for DDE is selected in the query.
-

Sending mail

If you are connected to a MAPI-compliant mail system, you can use the Send Mail command to transfer messages and attached files to others who are accessible through that system.

To send mail

- Click File, Send To.

If your mail system is currently open, the standard message creation dialog box appears. If it isn't open, the MAPI Choose Profile dialog appears and asks for your mail provider. Once you specify your mail provider, you can compose a message and attach files following the usual procedures.

When you send the message, it is delivered to the recipients' mail boxes as usual, and appears in the incoming mail list the next time they check their mail.



- If you encounter problems, contact your email administrator to make sure you have a MAPI-compliant mail system and to verify that it is properly configured.
-



HTML PUBLISHING AND INTERNET TOOLS

.....

10

The Paradox Internet tools allow you to harness the power of the Internet with a few simple steps. Use the Corel® Web Server (.EXE) for simple, straightforward Web publishing. Use the Corel Web Server Control if you want to program the server to send custom responses to browser requests or process information posted by electronic forms.

Creating and working with HTML documents

You can easily publish dynamic and static reports and tables to the Internet using the Paradox HTML Publishing Experts. You can also create static HTML documents from Paradox forms. Static documents are generated at the time they are saved with the HTML extension. If changes are made to the original data, they will not be reflected on this page. Dynamic documents are generated each time it is requested by a browser.

Using the Corel Web Server

You must have a TCP/IP network connection for the Corel Web Server and the Corel Web Server Control to function properly. You must also have a properly configured Web server running on your system in order to receive and process browser requests.

- “Setting up the Corel Web Server” on page 497.
- “Setting Corel Web Server properties” on page 497.

- “Starting and testing the Corel Web Server” on page 498.
- “Viewing Corel Web Server connections” on page 498.

HTML publishing in Paradox

The following features simplify HTML publishing in Paradox:

- the HTML Report Expert
- the HTML Table Expert
- the ability to save Paradox forms as HTML files
- HyperText template (.HTT) files

HTML Table Expert

The HTML Table Expert converts a table to an HTML text file so you can publish it either statically or dynamically on the World Wide Web. The Expert puts in the appropriate HTML tags and parameters automatically. You can modify the HTML document created by the Expert as you would any other HTML document. Click File, Publish to HTML to launch the HTML Table Expert.

HTML Report Expert

The HTML Report Expert helps you convert a report to an HTML text file so you can publish it either statically or dynamically on the World Wide Web. The Expert puts in the appropriate HTML tags and parameters automatically. You can later modify the resulting HTML document as you would any other HTML document. Click File, Publish to HTML to launch the HTML Report Expert.



- Any table or report that is published dynamically as HTML to the Private (:PRIV) directory cannot be accessed by a Web server while Paradox is running on the same system.
-

Publishing tables to HTML

The Paradox HTML Table Expert easily translates any Paradox table to an HTML file, allowing you to choose from a number of publishing options as you go.

To publish a table to HTML

- 1 View the table.
- 2 Click File, Publish to HTML.
- 3 Follow the steps in the HTML Table Expert.



- The Corel Web Server is case-sensitive, so make sure you note the exact filename used when saving documents for future reference.

Publishing reports to HTML

The Paradox HTML Report Expert easily translates any Paradox report to an HTML file, allowing you to choose from a number of publishing options as you go.

To publish a report to HTML

- 1 View the report.
- 2 Click File, Publish to HTML.
- 3 Follow the steps in the HTML Report Expert.



- Any information in the Page band of a report is not published by the HTML Expert. In order for information contained in the Page band to be viewable in an HTML document, it must be placed in the Report Band of the Report. Since pages are not supported by HTML, page numbers are ignored regardless of where they are placed.
- The Corel Web Server is case-sensitive, so make sure you note the exact filename used when saving documents for future reference.

Publishing forms to HTML

You can publish a Paradox form to a static HTML document. This feature works best with simple forms that use text, edit boxes, list boxes, radio buttons or check boxes. Form objects such as graphics, table frames, crosstabs, notebooks and charts do not translate statically to HTML.

To publish a form to an HTML file

- 1 View the form.
- 2 Click File, Publish to HTML.

- 3 Type a filename.
- 4 Choose .HTML as the file type from the list box.
- 5 Click the Save button.

Paradox saves an HTML version of your form that can be viewed by a Web browser.



- Paradox automatically adds FORM METHOD and ACTION tags to any form published to HTML. By default, the FORM METHOD tag is set to POST and the ACTION is set to the Paradox form object's noise name (e.g., #Form1). To set these properties yourself, change the HTMLMethod property or the HTMLAction property of the form using the Object Explorer.
 - Paradox also adds a Submit button to static forms published to HTML. For the Submit button to work with the Corel Web Server Control, you must add code to trap the POST action in the OnPostRequest event.
-

About HTT files

An .HTT (HyperText Template) file is an HTML file with custom metatags. These tags are Paradox-specific, and are used by the HTML Publishing Engine to produce standard HTML files. Conceptually, an .HTT file is an intermediary step in the Internet publishing system; all layout information is defined but metatags are used in place of tables, queries, and other database objects.

HTT files are generally used in dynamic publishing where the layout information is known but the actual data needs to be resolved at run time. The dynamic publishing of the Corel Web Server (.EXE) manages .HTT files automatically, so their existence and function are largely transparent to the user. If you are implementing your own dynamic publishing system with the Corel Web Server Control, you can generate .HTT files using File, Publish to HTML for tables, reports, and forms.

Working with the Corel Web Server

The Corel Web Server (.EXE) and related documentation are included when you install Paradox. The Setup program also copies the Corel Web Server Control (WEBSRV.OCX) and supporting DLLs into appropriate directories and registers them.

Installing a TCP/IP protocol

Your machine must have a TCP/IP protocol installed for the Corel Web Server and the Corel Web Server Control to function properly. Consult your Windows documentation for details on installing a TCP/IP protocol on your system.

Setting up the Corel Web Server

For help using the Corel Web Server, right-click the Corel Web Server icon and click View Connections to maximize the Web Server window. Choose Help Topics from the Help menu to open the Corel Web Server (.EXE) Help file.

To set up the Corel Web Server (.EXE)

- Click Start, Programs, Paradox 9, Utilities, Corel Web Server.

The Corel Web Server icon appears on the Windows Taskbar. It is active and ready to receive browser requests.

To add the Corel Web Server Control to a form

- 1 Open a form in the Form Design window.
- 2 Click the Corel Web Server Control button on the ActiveX Control toolbar.
- 3 Drag over the spot on your form where you want to add the Corel Web Server Control window.

Setting Corel Web Server properties

You can set properties for the Corel Web Server using the appropriate Web Server Properties dialog box. The Base Path and Default Page properties on the Web Server Properties dialog box Pages page must be set for the Web Server to function properly.

To set Corel Web Server (.EXE) properties

- Right-click the Corel Web Server icon on the Windows Taskbar and click Properties to open the Web Server Properties dialog box.

For more information about Corel Web Server properties, see the Corel Web Server (.EXE) online Help.

To set Corel Web Server Control properties

- Right-click the Corel Web Server Control object and choose Properties, Corel Web Server Control to open the Web Server Properties dialog box.

For more information about Corel Web Server Control properties, see About Corel Web Server Control properties in the online Help.

Starting and testing the Corel Web Server

The Web Server must be active in order to process requests from browsers. The Corel Web Server (.EXE) is launched in an active state, however, it can be shut down without exiting the Server. You can test the Corel Web Server (.EXE) or the Corel Web Server Control using your machine as both the client and the Server.

To start the Corel Web Server (.EXE)

- If the Corel Web Server (.EXE) has been shut down, you can either click the Startup/Shutdown toggle toolbar button, or right-click the Corel Web Server icon on the Windows Taskbar and click Startup.

To start the Corel Web Server Control

- Run a form containing a Corel Web Server Control object.

When you start the Corel Web Server Control, you have a fully functional Web server that can retrieve static HTML documents and graphics.

To test the Web Server

- 1 Launch your Web browser.
- 2 Type your computer name as the address to locate.

If you don't know your computer name, consult your Windows documentation. The page you specified in the Web Server Base Path property is displayed by the browser.



- The Corel Web Servers are case-sensitive. Be sure to use exactly the same filename you specified in the HTML Publishing Expert.
-

Viewing Corel Web Server connections

Browser requests are displayed in the Corel Web Server (.EXE) window and in the Corel Web Server Control object on a form.

To view connections to the Corel Web Server (.EXE)

- Maximize the Corel Web Server window by right-clicking the Corel Web Server icon on the Taskbar and clicking View Connections.

To view connections to the Corel Web Server Control

- View the Paradox form containing the Corel Web Server Control object.

The Web Server Repository

Use the Web Server Repository to store, view, and edit GXEngine templates for dynamic HTML publishing. It is a storage facility for HTML template files that are created by the Paradox HTML Publishing Experts and used by the Corel Web Server Control and the GXEngine to produce dynamic HTML files on browser requests.

- Click Tools, Web Server Repository to view a list of stored templates and their contents.



- You can drag a table or report from the Project Viewer to the Repository page of the Web Server Repository to launch the appropriate HTML Publishing Expert.
-

Hyperlink capabilities

Paradox now supports hyperlinks to the Internet as static design objects and as data in form and table fields. A text object can be formatted as a hyperlink when created using the Text Expert. It is also possible to format an existing text object as a hyperlink by adding ObjectPAL code to the mouseClick event in the Object Explorer. You can insert a hyperlink as data by simply typing the URL in a form or table field.

When you click on a hyperlink, Paradox uses the appropriate Internet protocol to follow the link (e.g., for HTTP it will launch the default browser to display the Web Site, for MAILTO it will open a new message in the default mail program, etc.).

Supported protocols for hyperlinks

Paradox supports the following Internet protocols for hyperlinks:

- HTTP
- FTP
- MAILTO
- GOPHER
- NEWS
- TELNET

Inserting hyperlinks

Hyperlinks to the Internet can be inserted as data in alpha fields in tables and forms, or as design objects on forms and reports.

To insert a hyperlink in a field

- Type the URL in an alpha field.

To insert a hyperlink as a design object

- 1 Open a form in Design mode.
- 2 Using the text tool, place a new text object on the form. Paradox launches the Text Expert.
- 3 Follow the steps in the Text Expert. In the last step, enable the Hyperlink button.
- 4 Type the URL in the Hyperlink box and click Finish.
- 5 Run the form to activate the hyperlink.



- Be sure to include the appropriate protocol for the hyperlink (e.g., HTTP://, FTP://).
 - You do not have to use the actual URL as the text to be linked. Whatever text you use will be linked to the URL specified.
-

Importing HTML data

The HTML Import Expert helps you import tables or lists from HTML files into Paradox tables. It will let you add the data to an existing table or help you create a new one for your data. Click File, Import to launch the HTML

Import Expert. For help using the HTML Import Expert, click the Help button in the Expert's dialog box.

To import data from an HTML file

- 1** Click File, Import.
- 2** Click the HTML Expert button.
- 3** Follow the steps in the HTML Import Expert.

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